

Relevance of Pecking Order and Trade-Off Theories in Financial Decision Making: Empirical Evidence in the Sri Lankan Companies

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Abstract: *This study tests the relevance and the applicability of pecking order theory and trade-off theory in financial decision making using 232 companies and 1624 balanced panel data finance and Non-financial firms for the period of 2011-2017 listed in the Colombo Stock Exchange (CSE). Pecking order theory explains that there is not a well-defined debt equity target, and there two kinds of equity, internal and external, one at the top of the pecking order and one at the bottom. Trade-off theory identifies the optimal debt-to-equity ratio as the level at which the cost of two offset each other. This study uses the pool regression, fixed effect and random effect models. Profitability, Tangibility, Firm size, Growth opportunity and Non-debt tax shield were used as independent variables, while leverage was the dependent variable. The study finds both theories are relevant and pecking order theory is more applicable in Sri Lankan companies.*

Keywords: Financial Decisions, Capital structure, Leverage, Trade-off Theory, Pecking Order Theory

1. Introduction

This paper extends further evidence of the relevance of trade off and pecking order theory in financial decision in the developing country. Every organization tries to maintain optimum capital structure to minimize the cost of capital for increase their market value through decision making. Financial decision making may lead to increase or decrease market value in an organization. Therefore financial decision making is playing a vital role in the modern business world. The capital structure decision is a major financial decision in an organization. Because it explains how to raise funds to achieve the objectives of the firm.

The researchers in the past have looked into the capital structure from various theoretical perspectives and brought forth a number of theories on capital structure. Pinegar and wilbricht (1989 and Hittle, Haddad and Gitmam (1992) finds that trade-off theory and pecking order theory are more applicable theories to explain the capital structure among other theories. Empirical findings suggest that profitability, Firm size, growth opportunity, tangibility and non-debt tax shield are the main determinates in the capital structure decision. Researches in the past, questions what is capital structure decision, what are the determinants of capital structure, the relationship between capital structure and firm value and how companies choose their capital structure. Most of the research works have been carried out in developed economies and very little is available about the capital structure of firms in emerging economies.

the empirical work done by Frank and Goyal (2003), Myers (1984), Sunder and Myers (1999) and Tong and Green (2005) confirm the pecking order hypothesis as a good descriptor of corporate financing behavior, but empirical tests done by Frank and Goyal (2009) and Leary and Roberts (2010) conclude that firms follow the trade-off theory of corporate financing. The recent studies by

Graham and Harvey (2001) and Mukherjee and Mahakud (2012) confirm that the two theories are complementary. Moyo (2013) empirically proves that the pecking order and trade-off theories are non-mutual exclusive in explaining the financial decisions in South African firms. Karadeniz, Kandir and Onal (2009) have found both trade-off and pecking order theories can explain some part of the capital structure in Turkish firms. Gaud, Jani and Bender (2005) on the basis of empirical study of 104 Swiss companies find that the trade-off theory works in explaining the capital structure of Swiss companies. Chakraborty (2010) explains that Pecking Order Theory can largely explain the capital structure in India in the post-reform period. Chen (2004) explains that a remarkable difference between the capital choices of Chinese firms and firms in developed economies.

Conclusions from theoretical and empirical research carried out in developed economies may not be applicable for developing countries. Because, differences of countries will affect to the financial decision making, for example legal system, government policy etc.

Senaratne (1998) finds that pecking order theory partially support to determine the capital structure in Sri Lanka. Samarakoon (1999) that empirical results suggest Sri Lankan companies follow Pecking Order Theory partially. There are few studies done in Sri Lanka in this field and most researchers have not considered all the sectors in Sri Lanka for their research regarding the capital structure decisions. Therefore the validity and application of the Trade-Off and Pecking Order theory in analysing the Sri Lankan company's capital structure are analysed partially in the past, it is not still properly analysed the validity and application of both trade-off and pecking order theory in all sectors so that it is questionable whether those two theories are applicable in Sri Lanka.

The main purpose of this study is to identify the extent the pecking order theory and trade-off theory are applicable in

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determining capital structure of companies listed in the Colombo stock exchange.

This study investigated the relevance and the applicability of pecking order theory and trade-off theory in financial decision making using 232 companies and 1624 balanced panel data finance and Non- financial firms for the period of 2011-2017 listed in the Colombo Stock Exchange (CSE) using the pool regression, fixed effect and random effect model.

The paper is organized as follows: first section of the paper gives a brief introduction to the background of the study and the research objectives. Section 2 summarizes the related literature. Section 3 gives description of the methodology. Section 4 discusses the results from the model used and section 5 presents the conclusion.

1.1 Literature Review

Theoretical Review

Capital structure theories present in different angles, the modern theory of capital structure begins with the celebrated paper of Modigliani and Miller (1958).

1.1.1 The Modigliani and Miller Propositions

The theory of capital structure was originally developed by Modigliani and Miller (1958). There are two major theories of capital structure which form basis of the paper. The first one is trade off theory and second one is pecking order theory. Therefore, theoretical principles underlying the financing, capital structure and lending choices of firms can be explained either in terms of a static trade-off theory or pecking order theory. The static trade – off theory explains various aspects, such as the exposure of the firm to insolvency and agency cost in contradiction of tax benefits associated with usage of debt. This theory is called “irrelevance theory” it means that the capital structure decisions that a firm takes does not have any impact on its value.

1.1.2 Trade-Off Theory

The trade-off theory is developed from the models established on taxes and agency cost. Modigliani and Miller (1963), and Jensen and Meckling (1976) posit that the firm has an optimum capital structure by balancing the benefits of debt and the cost of debt.

1.1.3 Pecking Order Theory

The idea of asymmetric information in determining the optimum capital structure is primarily stated by Myers (1984) and Myers and Majluf (1984). They focus on the information asymmetries between firm insiders and outsiders. They anticipated that managers take decisions in order to increase the wealth of current shareholders.

1.2 Empirical Review

Karadeniz, Kandir and Onal (2009) find both trade-off and pecking explain some part of the capital structure in Turkish firms. Gaud, Jani and Bender (2005) find both trade-off and pecking explain some part of the capital structure in Swiss companies. Chakraborty (2010) explains that Pecking Order Theory can largely explain the capital structure in India in the post-reform period. Chen (2004) explains that a remarkable difference between the capital choices of Chinese firms and firms in developed economies.

Senaratne (1998) finds that partially support the pecking order theory to explain the capital structure decisions in Sri Lanka. Samarakoon (1999) suggest Sri Lankan companies follow Pecking Order Theory partially.

1.2. Development of Hypothesis

According to the literature related to the determinants of capital structure following determinants and theoretical models can be identified. Pecking order theory and Trade-off theory explain the capital structure decision in an organization. Capital structure explains the leverage (composition of debt and equity) in an organization. The earlier empirical studies use following mentioned determinants to measure the leverage in an organization. Literature also discusses some firm-specific determinants of capital structure for both the trade-off theory and the pecking order theory. These determinants are ‘Profitability, Firm size, growth opportunity, tangibility and non-debt tax shield.’ It becomes especially worthwhile to investigate the firm-specific determinants Profitability and Firm size, since different outcomes are expected when comparing the static trade-off theory and the pecking-order theory with one and another.

1.2.1. Profitability

The theoretical prediction about the effect of profitability on leverage is confusing. Concerning the relationship between liquidity and debt, the pecking-order theory assumes that a negative relationship exists because firms with high liquidity tend to borrow less. The thinking behind this negative relationship from the pecking order theory is more liquid firms are in possession of more internal funds. The pecking order theory assumes that these internal funds first use when financing is needed. Most empirical studies confirm the negative relationship between liquidity and debt (Rajan & Zingales; Chen, 2004).

According to the trade-off theory, more profitable firms support to have more debt-serving capacity and more taxable income to shield. Therefore, according to this theory, when firms are profitable they are likely to prefer debt to other sources in order to benefit from the tax shield. Hence a positive relationship expects between profitability and leverage (Chen, 2004). Trade-off theory gives a signal to the society that rational investors are likely to maintain a higher firm value from a high debt level. Moreover, by using debt managers want to signal firm prospects to not well-informed outside investors. These investors believe

these signals since it is very costly for weak firms to signal in the same way (Chen, 2004). Further, a more successful firm will probably take on more debt because the firm can reduce the taxes from its higher earnings due to the extra interest. The pecking order theory assumes that there exists a negative relationship between profitability and leverage because when firms are more profitable, it has more internal funds in possession. These extra retained earnings will use first as investment funds and then which will be moved on to bonds and new equity when necessary.

1.2.2. Tangibility

Concerning tangibility, both the trade-off theory and the pecking-order theory assume a positive relationship between asset tangibility and leverage. When firms are in possession of relative high tangible assets than the lender's risk of suffering agency costs can be diminished, since these assets can use as collateral. When looking more closely to the trade-off theory and its relation to asset tangibility and debt issuing, it says that the result is consistent in terms of financial distress and bankruptcy costs. The pecking order theory explains this positive relationship in terms of asset mispricing (Chen, 2004). Moreover, when asset tangibility increases, the liquidation value of the firm does this also resulting in a decrease of the probability of mispricing in the event of bankruptcy. Firms those are unable to provide collateral will have to pay higher interest or might be forced to issue equity at the expense of debt.

Some studies from the developed countries report a significant positive relationship between tangibility and total debt (Rajan & Zingales, 1995). However, the findings from the developing countries are mixed. Wiwattanakantang (1999) observes a positive relationship between tangibility and leverage in Thailand. According to Huang and Song (2006) researcher measure tangibility as the ratio between fixed assets and total assets (TANG).

1.2.3. Firm Size

The theoretical prediction about the effect of firm size on leverage is confusing. Rajan and Zingales (1995) argue that larger firms generally disclose more information to outsiders than smaller ones. Larger firms with less asymmetric information problems should tend to have more equity than debt and hence have lower leverage. Therefore, following the pecking order theory of capital structure, it expects that the size of the firm would be negatively related to leverage. On the other hand, according to the trade-off theory, larger firms tend to be more diversified and thus less prone to bankruptcy. This argument suggests that firm size should be positively related to the leverage. A large number of studies find positive relationship between firm sizes and leverage (Wiwattanakantang, 1999; Huang and Song, 2006; Rajan and Zingales, 1995). On the other hand, Bevan and Danbolt (2002) observe that firm size is negatively related to short-term debt and positively related to long-term debt.

1.2.4. Growth Opportunities

According to the pecking order theory, there will be stronger preference for external financing, especially for debt. Hence we expect a positive relationship between growth and leverage. On the other hand, as discussed earlier, firms with growth opportunities may invest sub-optimally. Therefore creditors will be more reluctant to lend for longer periods. Rajan and Zingales (1995) find positive relationship between growth and leverage. According to trade-off theory there is a negative relationship between Growth opportunities and leverage. Frank and Goyal (2009), and Huang and Song (2006) empirically prove negative relationship between Growth opportunities and leverage.

The variables use in this study and their measurement are largely adopted from existing literature. This will help to highlight the similarities as well as differences in the determinants of capital structure in other countries. This study considers four key variables identified in studies by Rajan and Zingales (1995), and Bevan and Danbolt (2002). The Select independence variables are profitability, Tangibility, Firm size and the level of growth opportunities.

1.2.5. Non-debt tax shields

The tax deduction for depreciation and investment tax credits is called non-debt tax shields (NTDS). Firms are likely to favour debt because they can benefit from the tax shield due to interest deductibility. Thus we expect a positive relationship between effective tax rate and leverage. Following Huang and Song (2006) Researcher use the ratio of depreciation and amortization to total assets as the measure of non-debt tax shields (NDTS) in this study.

2. Research Methodology

The quantitative (deductive) research design is used for this study. The secondary data strategy is usually associated with the deductive approach. It is a popular and common strategy in business and financial management research.

2.1 Data and Sample

The researcher uses quantitative approach to achieve the objectives of this research and uses annual data on Sri Lankan companies which are listed in the CSE, for the period 2011- 2017 covering 7 years. The Colombo Stock Exchange (CSE) has 294 companies representing 20 business sectors and researcher uses 232 companies (79% of population) based on the availability of data. Researcher used balanced panel data of 232 companies and 1624 balanced panel data finance and Non- financial firms traded in the CSE. E-Views- 6 Statistical package is used to analyse the panel data in this research and results are presented in the form of tables. The data were averaged over the seven years to smooth the leverage and selected variables.

2.2 The variables

This study uses five independence variables identified in studies by Rajan and Zingales (1995), and Bevan and Danbolt (2002). Profitability, Tangibility, Firm size, Growth opportunity and non-debt tax shield were used as independent variables, while leverage was the dependent variable. The variables used in this study and their measurement are largely adopted from existing literature. This will help to highlight the similarities as well as the differences in the determinants of capital structure in other countries.

Research Model

$$LEV-t(mv)it = \beta_0 + \beta_1(PROF) + \beta_2(TANG) + \beta_3(SIZE) + \beta_4(GROW) + \beta_5(NDTS)$$

- LEV - Leverage
- PROF - Profitability
- TANG - Tangibility
- SIZE - Firm Size
- GROW - Growth Opportunity
- NDTS - Non- debt tax shields

Table 1: Measurement of Variables

Determinants	Measurement
Leverage (LEV)	Book Value of total liability scaled by Book value of total assets
Profitability (PROF)	Earnings before interest and tax (EBIT) scaled by total assets
Tangibility (TANG)	Fixed assets scaled by total assets
Growth Opportunities (GROW)	The percentage change of total assets.
Firm Size (SIZE)	The natural logarithm of sale.
Non-debt tax shields (NDTS)	The ratio of depreciation and amortization to total assets

According to the literature, searchers prove theoretical relationship between leverage and capital structure determinants under the pecking order theory and trade-off theory.

Table 2: Theoretical Relationship between leverage and capital structure determinants

Determinants	Theoretical Relationship	
Profitability	Pecking Order Theory	(-)
	Trade-off Theory	+
Tangibility	Pecking Order Theory	+
	Trade-off Theory	+
Firm Size	Pecking Order Theory	(-)
	Trade-off Theory	+
Growth Opportunities	Pecking Order Theory	+
	Trade-off Theory	(-)
Non-debt tax shields	Trade-off Theory	+

2.3 Empirical Methodology

In order to determine the firm-and country-specific factors of capital structure in the emerging markets researchers use panel data analysis as the econometric analysis technique (Chen, 2004). This analysis makes use of the data which

has both time dimension and cross section dimension. The most common panel data models are the pool regression model, fixed effects model and random effects model. Pooled regressing model neglect the cross section and time serious nature of data. The Hausman test helps to determine which model would result in better premises. If the co-efficiencies are irrelevant, the random effects model should be used. If they are relevant, the fixed effects model should be used (Hausman & Taylor, 1981). Husman test explain that,

H₀ - Null Hypothesis: Random effect model appropriate

H₁ - Alternative Hypothesis: Fixed effect model is appropriate

To determine the best model, whether fixed effect or random effect model, significant P value is used.

3. Results and Discussion

3.1 Three different estimation of Leverage equation in all sectors

Table 3: Results of OLS analysis over different Three different estimation of Leverage equation

Independent Variables	Dependent variable – Leverage		
	Fixed	Random	Pooled
PROF	-0.267***	-0.286***	-0.426***
	-0.0011	-0.0002	0.0000
GROW	0.2127	0.1691	-0.0405
	-0.3833	-0.4238	-0.8217
TANG	-0.0086	-0.0741**	-0.2044***
	-0.835	-0.0392	0.0000
SIZE	-0.0001	-1.2762	0.0005
	-0.7101	-0.9681	-0.2214
NDTS	0.6637	0.6735	0.6655
	-0.0544	-0.0509	-0.0432
No of observations	1624	1624	1624
R2	0.7203	0.0135	0.0443
Adjustments R2	0.6586	0.0104	0.0413
F statistics	11.6668	4.333	14.6396
Probability > F	0.0000	0.017	0.0000
Durbin-Watson stat	1.9631	1.16038	0.5845

- * Significant at 10% level
- ** Significant at 5% level
- *** Significant at 1% level

Probability of F test statistic is 0.00 that is highly significant even at 1% level of significant. Therefore the pool regression model is jointly significant to explain leverage. According to the fixed effect model, P value of F test is statistic. The fixed effect model is jointly significant to explain the leverage. The result of random effect regression model, the p value of F test statistic is 0.001. This is highly significant at 1% level of significant. A random effect model is jointly significant to explain the leverage.

As these three models are jointly significant researcher use Hausman test to identify the appropriate model from fixed effect model and random effect model. As the researcher considered the heterogeneity of the company the pooled

regression model is omitted. The result of Hausman test is provided the table 4

Table 4: Hausman test in all sectors

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	16.459	4	0.0025

Probability of chi-square test is statistic of the Hausman test is 0.0025 this is highly significant at the 1% level. Therefore Null hypothesis (H1) of Hausman test is rejected and it indicates that fixed effect regression model is most appropriate to explain the effect of explanatory variables on the leverage. According to the fixed effect model, Durbin-Watson statistic is also 1.9631 it means that there is no serial autocorrelation in the error term in the sample.

As the fixed effect model is jointly significant, Profitability, Tangibility, Firm size, growth opportunity and NDTs significant to explain the leverage of the companies. According to the individual probability value (PROF) is highly significant at 1% level of significant. Tangibility, firm size, growth opportunities are insignificant as their p values are greater than 5%. According to coefficient value profitability, tangibility, firm size consists of negative beta (β) value and growth opportunity and NDTs comprises positive (+) beta value. According to the sign of beta (β) value profitability and firm size hypothesis represent the pecking order theory. But the growth opportunity represents trade-off theory. As the P value of profitability is 0.001 this variable is highly significant to explain the leverage individually. Therefore profitability is highly sensitive to leverage of the companies. As the beta (β) value of profitability is negative. Researcher can take a decision that both theories are relevant and pecking order theory is widely acceptable in Sri Lankan context.

4. Conclusions

The study tests the relevance and the applicability of pecking order theory and trade-off theory in financial decision making using balanced panel data in finance and Non-financial firms for the period of 2011-2017 listed in the Colombo Stock Exchange (CSE). This study uses the pool regression model, fixed effect model (CSDV) and random effect model. Profitability, Tangibility, Firm size, Growth opportunity and non-debt tax shields are used as independent variables, while leverage is the dependent variable. The study finds that leverage is negatively correlated with profitability in Sri Lankan companies which supports the pecking order theory. Profitability, firm size, growth opportunity signs support to the pecking order theory and tangibility, non-debt tax shield support to trade off theory. The study finds that both theories are relevant and applicable in financial decision making in Sri Lanka. The most applicable theory is selected based on the highest number of predicted signs and their P values. Findings suggest that pecking order theory is more applicable in determining capital structure of companies as a whole based on the highest number of predicted signs and their P values.

Directions for future Researchers

This paper has laid some groundwork to explore the determinants of capital structure of Sri Lankan companies in the CSE listed companies, upon which a more detailed evaluation could be based. Further work is required to develop new hypotheses for the capital structure decisions of Sri Lankan companies and to design new variables to reflect the institutional influence. A larger, comprehensive, and detailed database is also required for a further detailed capital structure study.

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