



## Testing Pecking Order Prediction of Financing Choices in NEPSE Listed Non-Financial Companies of Nepal

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### Abstract

*In a financial market with information, agency and contract enforcement problem, partially informed firms have difficulty to access in capital markets and they face some restrictions to get adequate external capital at similar cost of their internal funds. Hence, these firms display the preferential order of financing choices, for example; first they invest internal funds, second debt capital and equity as last resort. However, such preferences of financing order commonly known as Pecking Order are not similar in all cases due to the nature of firms, their financial health, borrowing capacity, and functioning of capital markets. Under this backdrop, this study attempted to test this Pecking Order Hypothesis (POH) in financing decisions of Nepalese firms. Moreover, it tried to examine the effect of firm's borrowing capacity, informational efficiency, financial risk, operating growth, taxes and internal profitability on pecking order financing preferences of firms. It used quantitative approach of analysis to examine the financing behavior of 16 non-financial NEPSE listed companies. Descriptive and inferential statistics i.e. Pooled Ordinary Least Square (OLS) regression approach was used to test the hypothesis and data comprised unbalanced panel (n=262 observations) obtained from annual financial reports of sampled companies. The study results revealed that firm specific financial risk including borrowing capacity, operating growth, internal profitability and information efficiency have significant impact in firms' financing policies. Firms have preferences to use debts instead of equity when they face financing deficiency and these preferences are prominent when firms plummet in severe financing constraints. Hence, this study concluded that a firm's capacity to trade off its financial risk with some firm specific attributes outlined the most of*

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*the financing policies of Nepalese enterprises. These financial risks absorption capacity of the firms could be considerably improved if firms improved their profitability, sales growth, information efficiency and spare borrowing capacity; hence, these factors are imperative to design the optimal capital structure of firms and maximize their values.*

**Keywords:** *Optimal capital structure, asymmetric information, pecking order hypothesis, financing decisions, financing deficiency,*

## **Introduction**

In an ideal situation with no taxes, bankruptcy costs, agency costs, and asymmetric information; Modigliani and Miller (1958) proclaimed that a firm's capital structure has no impact on its financial value. Since, a firm's investment decisions are not affected by its financing decisions, internal and external capitals can be substituted without any additional cost. Modigliani and Miller (1958) further argued that the value of a company's operating assets will not be affected by whether its financing is contributed with a variety of securities or with equity alone. Additionally, they claim that the expected leverage effect viz; replacing costly equity with cheaper debt can increase a company's value, is an illusion since the cost of capital is determined by the company's assets rather than its financing sources.

However, financial markets are not as efficient as assumed in Modigliani and Miller (1958) prototype. Taxes (Kings, 1974), transaction cost (Coase, 1937, Williamson, 1981), bankruptcy costs (Alman, 1984), agency cost (Jensen & Meckling, 1976), information cost (Myers & Majluf, 1984), quota and credit rationing (Stieglitz, 1981), directed lending program (Banerjee & Duflo, 2014) etc. in financial markets are the frictions that restrict a firm's equal access to financing and these frictions impose additional cost on external capital tempting the firms to use more internal funds instead of debt and equity. Thus, in a world of taxes and bankruptcy cost, Modigliani and Miller (1958) propositions turn into the concept of a "static trade off" theory of capital structure (Myers, 1984). Thus, a firm's optimal capital structure is determined by the tradeoff of costs and benefits of debt financing, while taking into consideration of firm's assets and investment plan.

A set of theoretical propositions developed by Myers (1984) and Myers & Majluf (1984), on other hand, argued that due the cost advantage of internal finance, the value maximizing firms prefer to use internal funds over external financing.

For example; the financing hierarchy hypothesis proposes a plausible framework in which a firm prefers to use retained earnings, debt and equity consecutively due to the differentials in agency and information cost associated with these three types of capital. Such a financing hierarchy in preference of capital structure design is called as pecking order hypothesis and it is a widely accepted framework for understanding how firms choose their financing sources and the implications of these choices on their cost of capital and financial value.

There is no consistency in empirical results regarding the pecking order predictions in capital structure. In their extensive study of capital structure of industrialized countries, Rajan and Zingales (1995) found that pecking order is more pronounced in large firms as compared to small one since firm size had an inverse relationship with financial leverage. Studies including Akhtar and Oliver (2009) have found that firm size is positively correlated with financial leverage, while others, such as Ali (2011) has found that profitability has a positive effect on financial leverage. Moreover, Drobetz and Wanzenried (2006) and Antoniou et al. (2008), have found that profitability is inversely correlated with leverage due to a firm's preference for internal over external financing sources. These conflicting findings highlight the need to further evaluate the determinants of capital structure in order to better understand the relationship between capital structure and financing choices.

However, it is not clear to what extent the pecking order theory is relevant in the Nepalese context. While there have been several studies conducted in corporate capital structure including the conventional exogenous variables and their effect on firm's capital structure choice, the application of financing deficit variables to examine the pecking order theory and its relevance for understanding firms' financing decisions is lacking in Nepal particularly in case of NEPSE listed non-financial companies.

Such a lack of empirical evidence on the relevance of the pecking order theory in the Nepalese context represents a gap in our understanding of how Nepalese firms make financing decisions and the associated factors that influence these decisions. In order to address this gap, it is important to conduct a study on Nepalese firms to examine the applicability of pecking order theory and to identify any unique factors including firm size (Rajan & Zingales, 1995), tangibility (Titman & Wessels, 1988), profitability (Taggart, 1977; Marsh, 1982), growth (Lang, Ofek & Stultz, 1995), risk (Kim & Sorensen, 1986), and non-debt tax shield (Faccio & Lang, 2002) that may

influence a firm's financing choices in Nepal. This would provide valuable insights for researchers, policymakers, and practitioners seeking to understand the financing patterns of Nepalese firms and the factors that drive these patterns.

This study has been organized into five sections. Section one represents the background of the study, section two is the literature review and conceptual framework, section three proposes the research methodology, section four discusses the results and findings. The conclusions and implications are presented into section five. Finally, references are included at the end of the study.

### **Literature Review**

Firms that acquire more tangible assets is expected to employ more debt in their capital structure as compared to the firms with less proportion of tangible assets in their assets composition. Titman and Wessels (1988) use ratio of fixed assets to total asset as proxy to measure assets tangibility. According to Sayilgan et al. (2006) and Gaud et al. (2005), inventories can be included as part of a company's fixed assets because they represent physical goods that a company owns and holds for sale or production. These researchers argue that inventories should be considered as fixed assets because they can be used to secure borrowing. When a company borrows money, the lender may require collateral to secure the loan.

According to the Pecking Order Theory of capital structure proposed by Myers and Majluf (1984), firms in imperfect capital markets, characterized by asymmetric information or high transaction costs, typically prefer to raise capital in the following order: retained earnings, debt, and new equity. As a result, the ratio of earnings before interest, tax, and depreciation (EBITDA) to total assets has often been used as a proxy for profitability in studies such as those by Gaud et al. (2005), Rajan and Zingales (1995), Titman and Wessels (1998), and others.

Profitability is believed to impact a firm's debt capacity in two ways. First, an increase in profit leads to an increase in the value of interest deductibility, making it more attractive for the firm to take on debt. Second, an increase in profit reduces the probability of bankruptcy, making it less risky for the firm to take on debt. However, conventional leverage regressions have often found that the coefficient of profitability is negative, rather than positive, which Frank and Goyal (2009) attribute to the fact that an increase in profit may also lead to an increase in the firm's equity base (to the

extent that profits are not distributed as dividends), resulting in a mechanical decrease in leverage.

According to several empirical studies on capital structure, including those by Bradley et al. (1984), Jalilvand and Harris (1984), and Titman and Wessels (1988), the debt ratio of a firm is influenced by factors such as non-debt tax shields and product uniqueness. A comprehensive review of empirical research by Harris and Raviv (1991) found that leverage tends to increase with factors such as fixed costs, investment opportunities, non-debt tax shields, and firm size, and decrease with factors such as advertising costs, volatility, bankruptcy potential, profitability, and product uniqueness.

Non-debt tax shields refer to tax deductions that can reduce a company's tax liability without requiring the company to take on additional debt. Faccio and Lang (2002) found that firms with high levels of non-debt tax shields tend to have lower levels of debt relative to equity. Graham, Lemmon, and Wolf (2005) also found that firms with higher levels of non-debt tax shields tend to have higher valuations and lower cost of capital.

Titman and Wessels (1988) stated that firm size plays a key role in a firm's ability to access and choose between debt and equity financing. Larger firms tend to be more diversified and have a lower risk of failure, which can make them more attractive to lenders and investors. Jensen (1976) also argued that firm size has a positive impact on the supply of debt. As a result, firm size is often found to have a statistically significant and positive influence on capital structure, although the extent of this effect may vary depending on the size of the firm. In this study, firm size is measured using the natural log of total assets in millions of rupees, following the approach of Titman and Wessels (1988).

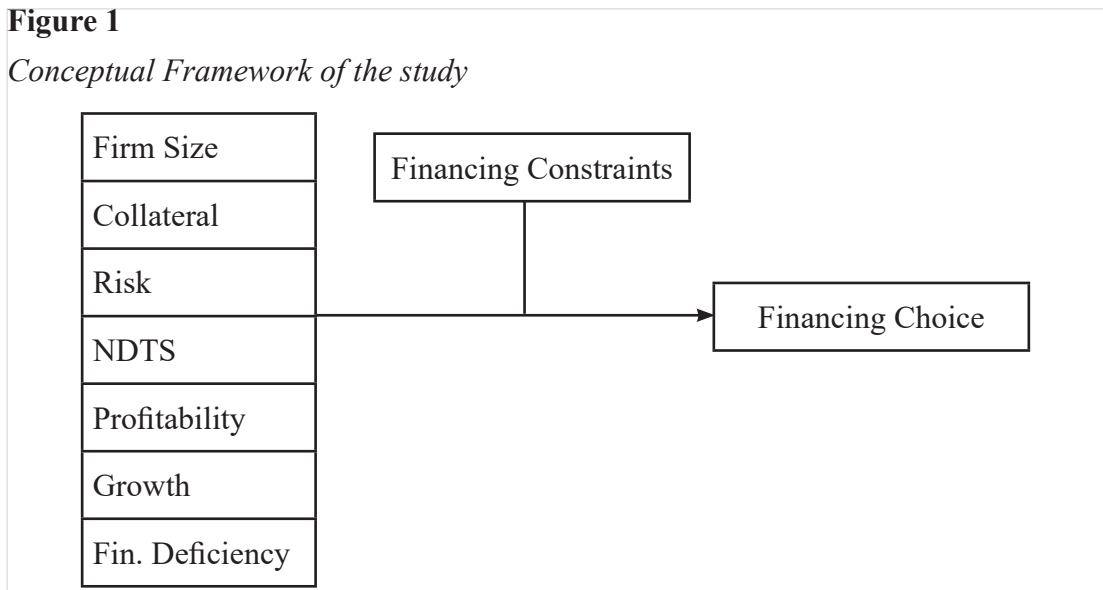
Financial deficit denotes the status of financial surplus or deficit of firms. In Shyam-Sundar & Myer (1999) the financing deficit is constructed from an aggregation of dividends, investment, change in working capital and internal cash flows. Hence, the negative value of financial deficit implies a financial surplus (i.e. the firm pays dividend and investment less than it internally generates cash). The positive value of financial deficit implies a financial deficit (i.e. the firm invests and pays dividend more than it internally generates cash). If the pecking order theory is correct, then the construction of the financing deficit variable is a justified aggregation as per Shyam-Sundar & Myer, (1999), Frank and Goyal (2003), Ogden & Wu, (2012) among others.

However, Shyam-Sundar & Myer (1999) found the debt financing does not dominate equity financing in magnitude. Net equity issues track the financing deficit quite closely, while net debt does not do so. It ruled out the pecking order in financing choice of US companies.

On the basis of literatures reviewed so far, the following conceptual model of financing decision can be proposed for this study. The idea of this framework is based upon the work of Shyam-Sudar & Myer, (1999), Frank and Goyal (2003), Ogden & Wu, (2012) among others.

**Figure 1**

*Conceptual Framework of the study*



**Table 1**

*Exogenous variables: Proxies, expected sign and proposed priori conjectures.*

<b>Determinants of financing choice</b>	<b>Proxy Measures</b>	<b>Expected sign</b>	<b>Rationale for expected sign</b>
<b>Profitability</b>	EAT+ Interest to total assets	+/-	More profitable firms should show more leverage in trade-off model; when investment opportunities are controlled but in pecking order model, it should have less leverage of more profitable firms.
<b>Tangibility</b>	Fixed Assets+ inventory/Total Assets	+	More collateral allows firms to issue more debt and increase their leverage
<b>Growth</b>	Change in Sales from previous year to this year / Sale of this year	+	Higher growth in sales of firms demands more leverage to finance its operations and inventories.
<b>Risk</b>	Volatility of earnings, STD.DEV of EBITDA.	-	due to uncertainty of cashflow, higher volatility of earnings should lead to lower amount of leverage.
<b>Size</b>	Natural logarithm of sales	+	The larger firms should display more leverage than smaller since the expected costs of financial distress are likely to be lower for larger firms.
<b>Deficiency</b>	Financial deficiency or funds flow deficit	+	The more financial deficiency the firms have, the more leverage the firms demand
<b>Non-Debt Tax Shields (NDTS)</b>	Depreciation and Amortization Expenses divided by total assets	-	The firms with large non-debt tax shields in relative to their cashflows should hold less leverage since they substitute the interest tax shields.
<b>Dummy Variables</b>	Financing constraints, Industry sectors etc.	- +	Financing constraints, dividend payment status, liquidity and sectors are the moderating variables expected to change the hypothesized relationship between leverage and independent variables.

## Research Methodology

This study utilizes quantitative research approach and adopted descriptive and analytical research design to draw the conclusion of the study. The variables were analyzed using unbalanced panel data over the 1998 AD to 2019 AD of time period. Sample was taken from NEPSE listed non-financial sectors of companies. By the end of 31<sup>st</sup> December 2019, there were 65 companies listed in NEPSE excluding the companies from financial, banking and insurance sectors. Out of these, 16 companies were chosen purposively. The companies that published their financial reports regularly to SEBON and NEPSE and that have completed their annual general meetings duly

**Table 2**

*List of Sample company and period of study*

<b>Name of sample companies</b>	<b>No. of obs.</b>	<b>Period covered (AD)</b>
Arun Valley Hydro LTD	12	2008-2019
Bottlers Nepal (Terai) Ltd	19	2001-20019
Butwal power company ltd	20	2000-2019
Bottlers Nepal Ltd	22	1998-2019
Chilime Hydro Ltd	15	2004-2019
Himalayan Distillery Ltd	15	2004-2019
National Hydro Ltd	12	2003-2009, 2014-2019
Nepal Lube Oil ltd	19	1998-2009, 2012-2019
Nepal Telecom Ltd	16	2004-2019
Oriental Hotel Ltd	20	2000-2019
Soaltee Hotel Ltd	20	2000-2019
Salt Trading Ltd	20	1999-2018
Regency Hotel Ltd	17	2003-2019
Unilever Ltd	23	1998-2019
Sanima Mai hydro Ltd	5	2015-2019
Shivam Cement Ltd	6	2014-2019
<b>Total</b>	<b>262</b>	



were taken as sample for this study. Under the selected sample companies, out of which seven companies were from manufacturing sectors and could obtain 104 observations from these companies. Similarly, there were five hydro power companies and could obtained 64 observations from these companies. Out of hotel sectors, three companies were chosen as sample, they comprised 57 observations and 20 observations were obtained from trading company. Additionally, 16 observations were taken from Nepal Telecom Limited. Altogether 262 observations comprised the total data from 16 sample companies for the given study period. The sample was characterized by unbalanced pooled cross-sectional data properties. The table 2 shows the details of sample companies selected and observation/ data taken for analysis.

### Method of Analysis

This study analyzed the data at three levels. At first, descriptive statistics are presented. It has presented the statistics like mean, standard deviation, minimum and maximum values of each variables. Secondly, the correlation analyses of study variables are conducted. It is expected that the correlation shows the magnitude and direction of relationship among the study variables.

At third, econometric analysis is carried down. Various capital structure theories explain the relationship of firm’s leverage decisions as outcome of its firm specific financial variables like profitability, tangibility, size, volatility, non-debt tax shields and growth. Therefore, the first approximation of determinants of capital structure choice can be presented in equation (1) as follows;

The first approximation of determinants of financing choice can be presented in following baseline regressions as mentioned in equation 1 and 2 respectively.

$$\text{Leverage} = f(\text{Tangibility, Profitability, Size, NDTs, Risk, Growth}) \dots\dots\dots(1)$$

In an econometric specification, the equation (1) can be written as follows:

$$L = \dots\dots\dots(2)$$

Where ‘L’ is the leverage ratio and it is explained by K independent factors X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>,... X<sub>k</sub> as mentioned in equation (2) and are the unidentified parameters. Based on equation (1) and (2), the following econometric models has been derived to analyze the factors of financing choice of Nepalese enterprises.

$$(LEV)_{it} = \alpha_1(TANG)_{it} + \alpha_2(PROF)_{it} + \alpha_3(NDTS)_{it} + \alpha_4(GROW)_{it} + \alpha_5(RISK)_{it} + \alpha_6(SIZE)_{it} + \dots\dots\dots(3)$$

The regression equations derived to test the models empirically for each of the dependent variables has therefore been specified as under:

$$(TD/TA)_{it} = +1(TANG)_{it} + f_2(PROF)_{it} + f_3(NDTS)_{it} + f_4(GROW)_{it} + f_5(RISK)_{it} + f_6(SIZE)_{it} + \dots \dots \dots (4)$$

$$(LTD/TA)_{it} = +1(TANG)_{it} + f_2(PROF)_{it} + f_3(NDTS)_{it} + f_4(GROW)_{it} + f_5(RISK)_{it} + f_6(SIZE)_{it} + \dots \dots \dots (5)$$

$$(STD/TA)_{it} = +1(TANG)_{it} + f_2(PROF)_{it} + f_3(NDTS)_{it} + f_4(GROW)_{it} + f_5(RISK)_{it} + f_6(SIZE)_{it} + \dots / \dots (6)$$

Where,  $f_1, f_2, f_3, f_4, f_5 > 0$  and  $f_6 < 0$

In the given equations, TD/TA is the book value of total debt of firm scaled by its total assets. LTD/TA is the ratio of long-term debt to assets and STD/TA is the ratio of short-term debt to assets. The independent variables for the given specification are firm size (*Size*), firm’s ratio of tangible assets plus inventory to total assets (*Tangibility*), profitability (*ROA*), Growth (*growth*), non-debt tax shield (*NDTS*) and risk measured as volatility of net profit (*Risk*).

### Pecking Order Financing

According to Shyam-Sundar and Myers (1999), equity is only issued in situations where the firm can only issue junk bonds and the cost of financial distress is high. They propose that the investigation of financing decisions should begin with the pecking order model of Myers and Majluf (1984), which suggests that information asymmetry between managers and outside investors can result in substantial costs that can be reduced by avoiding external financing. Internal financing is therefore preferred over external financing, with debt being less costly than external equity and therefore preferred if external financing is necessary.

Shyam-Sundar and Myers (1999) developed a simple regression model to test the pecking order model. This model has been widely used to test the strict pecking order hypothesis, as long as safe debts can be issued and all components of the deficits are exogenous.

$$\Delta D_{it} = a + b \text{DEF}_{it} + \dots \dots \dots (7)$$

Where;  $\Delta D_{it}$  is the amount of loan taken or repaid by firm ‘i’ in period ‘t’.  $\text{DEF}_{it}$  is the firm’s financial defect as calculated in eq. (7) for firm i and period t. It is further expected that the coefficient  $a=0$  and  $B=1$ . In given equation (6) funds flow deficit

(DEF<sub>t</sub>) does not include equity issues or repurchase because in simple pecking order it is predicted that the firm will not issue or redeem equity as last option. Hence the funds flow deficit (DEF<sub>t</sub>) has been derived as following:

$$DEF_t = \{DIV_t + X_t + \Delta W_t - C_t\} \dots\dots\dots (8)$$

Where,

C<sub>t</sub> = Operating Cashflows after interest and tax payments

DIV<sub>t</sub> = Dividend paid at end of years

X<sub>t</sub> = Capital expenses for the year

ΔW<sub>t</sub> = Net increment in working capital for the year

D<sub>t</sub> = Long term debt outstanding (Ogden & Wu, 2012)

In the extant literature, other econometric equation is expanded with basic pecking order model by adding firm characteristics factors (in first difference form) that has been robust determinants of optimal leverage under trade of theory. Following Frank and Goyal (2003), the following specification for testing extended pecking order model has been proposed:

$$\Delta D_{it} = +_1 \Delta TANG_{it} +_2 \Delta PROF_{it} +_3 \Delta SIZE_{it} +_4 \Delta DEF_{it} + \dots\dots (9)$$

Where, ΔTANG, ΔPROF, ΔSIZE are changes in tangibility, profitability and size respectively. Due to limitation of data, Market to Book ratio of Assets could not be included as in original regression. As Frank and Goyal (2003) claim if pecking order is true, deficiency proxy should subsume the firm characteristics variables.

## Results and Discussions

### Descriptive Analysis

Table 3 provides a summary statistic of all variables used in this study. In the table, the variables are separated in three sections. The first section shows the statistics of dependent variables i.e. Long-term debt, short term debt and total debt ratios including change in long term debt over the accounting period. Statistics of control variables like profitability, size, non-debt tax shields, tangibility, and growth, risks, deficiency and log sales are presented in second section. Third section in each panel of table provides the statistics of moderating variables like liquidity, interest coverage, financing constraints and efficiency measures.

The mean values of the total debt ratio over the study period is 51.6%. and its variability as measured in standard deviation is 26.8%. The mean value of long-term debt ratio are 15.9% with standard deviation of 20.5%. The short-term debt constitutes 34.9% with 21.6% of variability. All of these ratios were obtained after winsorizing the data at cuts of 1% and 99% of observations to reduce the effects of outliers. The standard deviation, minimum values and maximum values of study variables are also presented in table for statistical inferences. 1<sup>st</sup> percentile value of long-term debt is nil. It means that one percent of Nepalese companies have not used long term debt over the study period.

Nepalese companies are moderately levered as noticed in their capital structure. Their indebtedness constitutes over 51% of their total assets. Additionally, short term debts have more weights than long term debts in total leverage, it could be attributed to the reason that firms either have not easy access to long term debt or even if they have access, there are restrictions in long term debt covenants that make them reluctant to obtain as much long-term funds as they require.

**Table 3**

*Summary Statistics of financial Variables*

Variable	Obs	Mean	Std.Dev.	Min	Max
Total Debt Ratio (TD/TA)	262	0.516	0.268	0.018	0.985
Long Term Debt (LTD/TA)	262	0.159	0.205	0.000	0.594
Short Term Debt (STD/TA)	262	0.349	0.216	0.004	0.973
Change in LTD ( $\Delta$ LTD/K)	244	0.033	0.379	-2.157	3.127
Collateral (TANG)	262	0.695	0.187	0.311	0.977
Size (LOG TA)	262	7.316	1.046	4.617	8.904
Profitability (ROA)	262	0.132	0.101	-0.052	0.386
Sales Growth (GROW)	261	0.152	0.661	-0.982	7.548
Non-Debt Tax Shields	262	0.035	0.023	0.001	0.139
Risk (VARNP)	244	0.015	2.223	-13.892	12.882
Liquidity (CR)	262	2.556	7.089	0.052	83.213
Utilization Efficiency (ATR)	262	0.807	0.765	0.019	4.822
Fin. Deficiency (DEFK)	244	0.159	1.331	-2.726	13.488
Discriminant score (ZFC)	245	0.000	1.127	-1.995	2.559

Moreover, the results indicate the usage of higher proportion of short-term debt in Nepalese companies. The higher short-term debt positions in developing countries may be justified by various past empirical studies. Rajan and Jingles (1994), Diamond (1993) and Demirguc–Kuniand and Maksimovic (1999) proclaimed that in developing countries companies depend more on short term debt. The reason could be attributed to greater information gap in market among borrowers and lenders for long term debt due to maturity risk.

Change in long term debt is the key dependent variable in capital structure study particularly for testing the pecking order model. Table 3 shows mean ratio of annual change in long term debt and its standard deviation respectively. It comprises average value of both borrowing and refunding transactions of Nepalese firms. During the period, it shows average long-term borrowing increased to 3.3%. It is higher than the study results found in Ogden and Wu (2012). In their study, they found average net debt issuance at 2.10% and average financing deficit at 4.73% respectively. The average financing deficit is 15.9% in this study and its standard deviation is 1.33 times of net fixed assets. Interestingly refunding exceeds the borrowing in first percentile of firms. But maximum value is 13.48%. It indicates the slower rate of change in long term composition of debt in Nepalese firms. Deficiency (DEFK) is a dynamic variable that measures the financial deficiency of firm in particular year. The positive value of DEFK variable denotes the financial deficiency and its negative value denotes the financial surplus. 54% of firms have negative value of this variable denoting their status of financial surplus.

### **Correlation of Leverage and other Fundamental Factors**

Table 4 presents the correlation among debt ratio with independent variables like size, collateral, profitability, risk, NDTs and sales growth. Long term debt is positively correlated with assets tangibility and sales growth but it is negatively associated with profitability, size, risk and non-debt tax shields variables. However, the long-term debt has statistically significant relation with profitability, tangibility and financial deficiency. NDTs and growth of sales is noticed negatively correlated with long-term debt but this relationship is weak and not significant. Long term debt and short-term debt of Nepalese firms have strong negative correlations. The reason behind such relation could be debt substitutions by Nepalese firms. Size and short-term debt is negatively correlated but contrary to negative correlation of long-

term debt, profitability and short-term debt is positively correlated. The correlation coefficient between total leverage and size is significant but not as per expectation. The correlation of leverage with profitability is found strongly significant but negative. Higher correlation is noticed between risk and profitability denoting the risky firms earns more profits and vice versa.

**Table 4**

*Correlation Coefficients matrix of Study Variables*

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Total Debt Ratio (TD/TA)	1.000										
(2) Long Term Debt (LTD/TA)	0.650*	1.000									
(3) Short Term Debt (STD/TA)	0.571*	-0.226*	1.000								
(4) Change in LTD ( $\Delta$ LTD)	0.180*	0.267*	-0.012	1.000							
(5) Profitability (ROA)	-0.215*	-0.355*	0.108	-0.094	1.000						
(6) Collateral (TANG)	0.031	0.366*	-0.381*	-0.102	-0.265*	1.000					
(7) Size (log TA)	-0.211*	-0.001	-0.280*	-0.041	0.102	0.303*	1.000				
(8) Sales Growth (GROW)	0.052	0.057	0.001	-0.059	0.061	0.032	0.033	1.000			
(9) Risk (Var. NP)	0.011	-0.043	0.046	-0.159*	0.167*	-0.062	-0.102	-0.043	1.000		
(10) Non-Debt Tax Shield	-0.145*	-0.092	-0.102	-0.170*	-0.026	0.374*	0.020	0.039	-0.010	1.000	
(11) Fin. Deficiency (DEFK)	0.033	0.201*	-0.148*	0.404*	-0.070	-0.158*	-0.016	-0.048	-0.033	-0.187*	1.000

\* indicates the correlation is significant at the 0.05 level (2-tailed).

As per the prior expectation, the correlation between NDTs and total leverage is negative and significant. It shows the firms substitutes the interest tax shields with non-debt tax shields. Interestingly, risk has positive relation with total debt but negative with long-term debt. It indicates the increase in long term debt increase the degree of financial leverage and makes more fluctuations in profitability and vice versa. Firm size has negative correlation with risk. The reason behind such relationship could be attributed to higher capacity of large firms to manage the fluctuations of profit. Interestingly, correlation between profitability and debt level is negatively associated.

It indicates higher the profitability will lower the debt level and lower will be the financial distress risk of companies.

According to Myers and Majluf (1984), information asymmetry between managers and outside investors can result in substantial costs that can be reduced by avoiding external financing. Therefore, internal financing is preferred over external financing, with the corporate financing preference hierarchy or pecking order putting internal financing at the top. If a firm does engage in external financing, it will prioritize debt over external equity, which is considered more costly. Shyam-Sunder and Myers (1999) have developed a regression model to test this pecking order. In this model, long term debt retirement or issue is explained by financing deficit of the firm. Employing pecking order equation (7) as suggested in (Shyam-Sundar & Myer, 1999), estimation results are obtained and they are presented in table 5.

### **Econometric Results**

Table 5 reports the regression results on firm financing choices based upon decomposition of debts into long-term and short-term maturity. Interestingly the regression results revealed further evidences on firm financing behaviors of Nepalese firms. Short term financing behavior of Nepalese firms is less influenced by information problem than long-term financing choice when compared to profitability coefficient. The long-term financing decision is negatively affected by firm's profitability. It indicates that the firms with larger profitability prefer less long-term debt as compared to the firms with smaller profitability ratio confirming the pecking order theory as advised by Myers (1984). The reasons could be attributed to asymmetric information and transaction cost that are pronounced more in long term financing than short term debts that tempt to managers to use past profitability or internal funds as major source of assets financing.

A positive relation between long-term debt and tangibility could also be due to the transaction cost or information problem in capital market. Larger collateral values reduce the information problem between lenders and borrowers hence tangibility coefficient estimate on long term debt is consistent with theory. A negative relation between assets tangibility and short-term financing may be due to the lender's reliance more on short term solvency or cashflows position of the firm rather than their dependency on collateral or liquidation value. Assets tangibility coefficients are

significant in both of the cases. This finding supports the recent empirical evidences on financing choices of Nepalese firm (Bhattarai, 2015).

According to prior expectations, non-debt tax shields (NDTS) are negatively correlated with a firm's leverage. However, the coefficient for NDTS is positive in short-term finance. The tradeoff theory suggests that firms with high levels of NDTS, which can be deducted from taxable income, are expected to have less debt than other firms and vice versa. The financing policies of Nepalese firms concerning NDTS differ between long-term and short-term debt. The coefficient for NDTS is less sensitive in short-term debt than in long-term debt ratios. This evidence is consistent with the tradeoff theory and the findings of earlier studies by DeAngelo & Masulis (1980), Ozkan (2001), and Bhattarai (2015).

**Table 5**

*Determinants of firm financing policy (Decomposition Analysis)*

Models	(1)	(2)	(3)	(4) <sup>+</sup>	(5) <sup>+</sup>	(6) <sup>+</sup>
	Ltd/TA	Std/TA	Td/TA	Ltd/TA	Std/TA	Td/TA
Profitability	-0.5498*** (0.1233)	0.02732 (0.1430)	-0.5626** (0.1758)	-0.5498*** (0.0928)	0.02732 (0.1635)	-0.5626*** (0.1625)
Collateral	0.4394*** (0.0718)	-0.3678*** (0.0832)	0.1612 (0.1023)	0.4394*** (0.0743)	-0.3678*** (0.0796)	0.1612 (0.1134)
Sales Growth	0.1557** (0.0586)	0.1594* (0.0679)	0.3398*** (0.0835)	0.1557** (0.0598)	0.1594* (0.0644)	0.3398*** (0.0801)
NDTS	-2.5970*** (0.5733)	0.1192 (0.6646)	-2.7265*** (0.8172)	-2.5970*** (0.5378)	0.1192 (0.7203)	-2.7265*** (0.8013)
Firm Size	-0.01898 (0.0115)	-0.03608** (0.0133)	-0.05737*** (0.0164)	-0.01898 (0.0114)	-0.03608* (0.0159)	-0.05737*** (0.0168)
Financial Risk	-0.008707 (0.0194)	-0.003518 (0.0225)	-0.01159 (0.0276)	-0.008707 (0.0239)	-0.003518 (0.0241)	-0.01159 (0.0292)
Constant	0.1329 (0.0825)	0.8425*** (0.0956)	0.9509*** (0.1175)	0.1329 (0.0804)	0.8425*** (0.0896)	0.9509*** (0.1035)
N	244	244	244	244	244	244
R <sup>2</sup>	0.2912	0.1801	0.1803	0.2912	0.1801	0.1803

*Standard errors in parentheses*

*+ results based on VCA(Robust) standard errors*

*\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.0*

Non-debt tax shields (NDTS) as per priori expectation is negative with firm's leverage. However, NDTS coefficient is positive in short term finance. Tradeoff theory



suggest that the firms with high level of non-debt tax shields, which can be deducted from the taxable income, are expected to have less debt than other firms and vice versa. Financing policies of Nepalese firms as regards to non-debt tax shields is different upon long term and short-term debt. NDTs coefficient is less sensitive in short term debt than long term debt ratio. The evidence is consistent with tradeoff theory and early studies of DeAngelo & Masulis, (1980), Ozkan, (2001); Bhattarai (2015) etc.

The relationship between growth opportunities and leverage is positive and statistically significant in all models. The evidence suggests that sales growth requires more long-term and short-term debt financing to fund asset expansion and working capital needs. According to agency theory, equity-controlled firms tend to invest sub-optimally in order to expropriate wealth from bondholders, leading to higher agency costs in growing industries that have more flexibility in their investment choices. As a result, expected future growth should be positively related to long-term debt levels. These findings are consistent with the arguments made by Myers (1984), Jensen and Meckling (1976), Smith (1977), and Warner (1977), among others.

The use of more leverage by small firms may also provide insight into the possible risk factors underlying the "small firm effect" (Titman & Wessels, 1988). By borrowing more debt, small firms are more sensitive to economic downturns that have less of an effect on larger, less leveraged firms. The negative relationship between debt ratios and firm size may also reflect the information problems that small firms face when issuing equity. It can be argued that size serves as a proxy for the availability of information that outsiders have about the firm. From the pecking order perspective, less information asymmetry makes equity issuance more appealing to larger firms (Bashu & Rajeev, 2013). Thus, a negative relationship between size and leverage is expected. However, while the coefficient estimates for size attributes are small, they are all statistically significant in the equations.

In firm's debt decisions, it was found the negative effect of internal profitability on both long-term ( $\beta = -0.5498$ ) and total debt ratio ( $\beta = -0.5626$ ). Moreover, the firms with lower internal profitability relied more on debt finance for their investment until the collateral or debt capacity supports it, otherwise debt distressed firms highly depended on retained earnings for their investible funds.

Furthermore, the growth firms used more debts (short-term and long-term) to finance their growth opportunities ( $\beta = 0.155, 0.159$  and  $0.339$ ) in LTD, STD and TD

respectively. Interestingly, the growth had positive coefficients and profit had negative coefficient explaining the partial effect of these two control variables implying that if firms are unable to finance their growth activities only with internal profit, then they depend on debt finance. Firm size was negatively related with total debt ( $\beta = -0.057$ ) and short-term debt ( $\beta = -0.036$ ) but it was insignificant in long-term debt model. The risk coefficients ( $\beta = 0.153, 0.1614$  and  $0.3352$ ) for LTD, STD and TD were found positive when firms are in financing constraints regime but in overall, effect of risk or income volatility on debt level were negative showing their tendency to substitute the operating risk with less financial risk causing to lower debt ratios.

Additionally, Nepalese firm's debt decisions responded to their non-debt tax shields as well. The NDTs coefficients ( $\beta = 2.59, 0.$  and  $2.72$ ) were found negative in long term and short-term debt models implying that the firms that enjoy higher non-debt tax shields preferred less long-term and total debt. However, the effect of NDTs is not found significant in short term debt model. The results reported in table 5 (models 4, 5, and 6) using robust standard errors were not significantly different from the results reported in table 3.8 (models 1, 2, and 3). These robust standard errors, also known as *White, Huber, or Eicker standard errors, or heteroskedasticity-robust standard errors*, are unbiased estimators that are asymptotically distributed regardless of whether heteroskedasticity is present. These results do provide support for the effect of debt ratios on profitability, size, collateral, growth, and non-debt tax shields. However, the result for the risk factor is inconclusive and warrants further study to determine if the proxies used in the model adequately capture the relevant aspects of the attributes suggested by theories.

### **Pecking Order Models**

The result of basic OLS model for pecking order has been reported in model (1) and (2) of table 6. The dependent variable is the net change in LTD in model (1) and change in total debt level in model (2). The financial deficit (DEF/K) coefficients are dominant in model (1) but it is negative and insignificant in model (2). In long term debt model, the deficit coefficient is 0.099 and it is highly significant. It is in the right order of direction but significantly less than the simple pecking order prediction of 1. R squared value is 10.05%. This model under its simplicity does a great job of explaining the debt issue behavior of firms. The financial deficit is the important explanatory

variable in determining the long-term debt issue or retirement decisions of the firm. This coefficient is negative and stronger in case of total debt issuance; however, the R squared value dropped to 0.73 % as reported in model 2. Similar to expectation the constant intercept in both of the models are near to zero supporting the pecking order hypothesis of financing decisions. These results support the findings of (Shyam-Sundar & Myer, 1999) and (Ogden & Wu, 2012) . It confirmed that the debt finance is the dominant source of external funding.

**Table 6**

*Results of Pecking Order choices in financing*

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	$\Delta$ LTD	$\Delta$ TD	$\Delta$ LTD	$\Delta$ TD	$\Delta$ LTD	$\Delta$ TD
DEF/K	0.099*** (0.022)	-0.155 (0.153)	0.088*** (0.022)	-0.246 (0.158)	0.066* (0.031)	-0.018 (0.203)
Profitability			-0.073 (0.046)	-0.802* (0.333)	-0.073 (0.046)	-0.804* (0.331)
Collateral			-0.075** (0.027)	-0.441** (0.161)	-0.076** (0.027)	-0.434** (0.161)
Size			0.004 (0.005)	-0.020 (0.032)	0.004 (0.005)	-0.020 (0.031)
Def. Dummy					-0.014 (0.012)	0.148 (0.067)
N	244	243	244	243	244	243
R <sup>2</sup>	10.05 %	7.3%	13.08%	6.76%	13.51%	8.09%

Standard errors in parentheses \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

In model 3 and 4, pecking order model is extended to other firm specific attributes following the approach of (Ogden & Wu, 2012). The basic variables added to financial deficits are firm size, tangibility and profitability. Moreover, the effect of financial deficit Vs surplus on financing decision has been examined in model 5 and 6. Market to book value of assets ratio, cash reserves and industry median market leverage are the other variables used in estimating the extended pecking order model in Ogden& Wu (2012) but these three variables were ignored in our estimation due to

unavailability of market data. Results of extended pecking order model are displayed in column 3 and 4 in table 6 in which the independent variables include DEF/K and interactive variables involving some of the firm characteristics variables that were found significant in earlier leverage estimation in financing decisions model. Tangibility, profitability and firm size were the variables that were found significant in earlier conventional leverage equations. As reported in model 3 the interactive variable viz; collateral was found statistically significant but sign changed to negative. Similarly, in all of the models, the tangibility variable is found significant but the coefficient is not in predicted sign. Higher the tangibility, lower the debt issuance is noticed in these models which contradicts with conventional leverage results.

Moreover, the addition of firm specific variables doesn't change the stability of financial deficit coefficient. It suggested that the basic pecking order estimation is the best explanatory model of firm financing decision. In model 5 and 6, financial deficit dummy is added. The coefficient of financial deficit dummy is negative in long term debt and total model as per our priori expectations but it is not significant in model 5. In model 6, the dummy coefficient is negative and significant. These results suggest the negative effect of financial deficiency (surplus) on debt decisions.

### **Firm Financial Constraints**

Table 7 reports the regression results of split sample. FC panel constitutes the firm year observations that have been predicted as financially constrained group through discriminant score under discriminant analysis and NFC panel constitutes the sample of firms assumed to be not-financially constrained under discriminant analysis results. Interestingly the split sample results are different to each other. It has been found that the pecking order hypothesis is pronounced more in FC panel of firms. The financial deficit coefficients for long term debt is positive and significant as per the prior expectation. These coefficients are 0.3928 for explaining the change in long term debt and total debt. However, these coefficients are less than 1 as suggested in (Shyam-Sundar & Myer, 1999). However, in total debt model, the financial deficiency coefficients are not as per positive sign and statistically significant. The mean coefficients of size, profitability, and tangibility variables in long term model of FC panel are statistically different from zero. However, it shows the size has negative effect on long term debt decisions but profitability and tangibility have positive effect.

**Table 7***Firm Financial constraints and Pecking Order hypothesis*

Variables	FC Panel		NFC Panel	
	$\Delta$ LTD	$\Delta$ TD	$\Delta$ LTD	$\Delta$ TD
DEF/K	0.3928*** (3.30)	-0.4233 (-0.98)	0.0922** (0.35)	-0.1605 (-0.95)
Size	-0.0829** (-4.23)	0.0812 (1.47)	0.0023 (0.25)	-0.0638* (-1.75)
Profitability	1.492*** (3.46)	-0.4465 (-0.44)	-0.1568** (-2.05)	-0.8135* (-0.1.88)
Tangibility	0.7302** (5.54)	-0.8493** (-2.67)	0.0776 (1.38)	-0.2872 (-1.54)
Constant	0.2950* (2.00)	-0.1156 (0.25)	0.026 (0.30)	0.8174* (2.55)
<i>Adj.R</i> <sup>2</sup>	41.69%	10.52%	9.10%	9.11%
<i>N</i>	76	76	168	168

*t* statistics in parentheses\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

These results are in line of pecking order model because (Shyam-Sundar & Myer, 1999) argued if pecking order model is true DEF/K should subsume the firm characteristics variables. Contrastingly NFC firm's debt issue or retirement decisions are less affected by DEF/K variable. In these models, intercepts are greater than zero and significant in LTD model. In FC and NFC panel of firms, size variables have positive impact on debt decisions particularly in LTD and TD model respectively. The coefficients of profitability and tangibility variables are inconsistent and but statistically significant in some models. These results contradict with the finding of (Ogden & Wu, 2012) (Titman & Wessels, 1988) and (Shyam-Sundar & Myer, 1999) among others.

### Conclusions and Implications

Firms financing decisions were partially explained by their internal profitability, risk, size, and collateral. Risk and profitability negatively impact the debt level while tangibility had positive impact. Agency and information problems might be the reasons

behind such debt behavior of firms. Further, it can be concluded that the financing constraints have differential impact on firm's financing decisions. The financially constrained firms are more prone to apply pecking order in their debt issue decisions but similar is not the case for not-financially constrained firms. This study finding does not confirm the application of pecking order in Nepalese enterprises but it disclosed that the debt is the dominant source of external financing in financially constrained firms. The financial deficiency coefficients of FC panel are substantially higher than NFC panel suggesting the possibility of pecking order more pronounced in financially constrained firms.

The major theoretical implication of this study supports the line of enquiry-based on agency theory, information theory, credit rationing and bankruptcy theory rooted to Akerlof (1970), Myers & Majluf (1984), Stiglitz & Weiss (1981) Bernanke & Gertler (1989) and Gertler (1992) among others. It suggested to address the frictions like information, agency, bankruptcy, and transaction costs in capital markets that create a wedge between cost of internal and external finance. The practical implication of this study suggests; the firm specific financial factors like strong internal cashflows, and collateral or networth of the firms could alleviate different forms of market imperfections and encourage easy access to financing of the firms. Most importantly, the measures of corporate governance help to reduce the agency and information problems and increase investment. Next, a firm's capacity to trade off its financial risk with some firm specific attributes shapes most of the financing policies of Nepalese enterprises. These financial risks bearing capacity of the firms can be significantly improved with their profitability, sales growth, NDTs and collateral; hence, these factors are imperative to design the optimal capital structure and maximize their values.

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