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CHOICE OF CAPITAL STRUCTURE MODEL: AN EMPIRICAL ANALYSIS WITH REFERENCE TO STATIC TRADE-OFF VS PECKING ORDER THEORIES IN BEVERAGE AND ALCOHOL INDUSTRY IN INDIA

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ABSTRACT

This study attempts to determine the predictors of capital structure (CS) in the beverage and alcohol industry in India and also enhance the study to find out the approach followed by these firms to decide their CS. To rationalize this, two controversial theories namely static trade-off theory (STT) and pecking order theory (POT) are tested based on the earlier empirical finding supporting the theories. Correlation and regression are used to find the relation between various independent variables and leverage (LEV). The findings support the POT model, emphasizing that a pecking hierarchy is followed in beverage and alcohol industry in India. Collateral asset and profitability are found to be the major determinants of CS.

KEYWORDS
Capital structure; static trade off theory; pecking order theory; leverage; *beverage and alcohol*

JEL CLASSIFICATION
 G32; G11; G17

INTRODUCTION

Capital structure (*CS*) theory is one of the most enigmatic fields in finance. It deals with the firm's choice of the types of securities to issue. There are different views on how *CS* influences the value of the firm however; optimal *CS* is a question, which the managers themselves find difficult to answer. The earlier empirical works concentrated on exploring the determinants of optimal *CS*. The work of **Modigilani and Miller (1958)**[1] has analyzed if debt is a vital part of *CS*. The advantages from having debt capital in the *CS* of the firm has led to many researches in the field but still have left it unexplored with hopes for further research. *Static trade-off theory* (*STT*) and *pecking order theory* (*POT*) are two controversial approaches explaining the firm's behavior in deciding the share of debt capital in their *CS*. *STT* explains how trade-off between the benefits and cost leads to well-defined target debt ratios, while *POT* gives a pecking hierarchy those mangers follow in funding *CS*. Hence, this study attempts to study the model followed in beverage and alcohol industry in India.

BEVERAGE AND ALCOHOL INDUSTRY IN INDIA

India is the world's second largest producer of food next to China, and has the potential of being the biggest with the food and agricultural sector. It is one of the fastest growing economies today and among the world's leading agricultural producers. Agriculture and allied sectors accounted for 15.7% of the GDP in 2009–10.The total food production in India is likely to double in the next ten years and there is an opportunity for large investments in food and food processing technologies, skills and equipment, especially in areas of canning, dairy and food processing, specialty processing, packaging, frozen food/refrigeration and thermo processing. Although India is one of the world's major food producers it accounts for less than 1.5 per cent of international food trade, which indicated a vast scope for both investors and exporters. Consumer expenditure on food, beverages and tobacco in India is forecasted to grow at a CAGR of 12.2% during 2007 to 2011. India is the world's largest market for whisky will also remain as major global spirits market in the coming years. The alcoholic drink value growth for the year 2010 is 16.9% and is forecasted to increase to 81.6% by 2015 while the soft drink volume growth for 2010 is 9.3% and forecasted to grow as 51.7% by 2015 (**India Food and Drink Report Q1 2011**).

CONCEPTS AND LITERATURE REVIEW
STATIC TRADE-OFF THEORY (STT)
Static trade-off theory *(STT)* elucidates that a firm follows a target debt-equity ratio and then behaves accordingly. The benefits and costs associated with the debt option sets this target ratio (**SyedTahir Hijazi and Yasir Bin Tariq 2006**)[2]. In a *STT* framework the firm is viewed as setting a target debt to value ratio and gradually moving towards it (**Myers 1984**)[3]. The benefits from debt tax shield are thus adjusted against cost of financial distress, agency cost, informational asymmetry and transaction cost. The optimal debt level is attained when the marginal value of the benefits associated with debt issues exactly offsets the increase in the present value of the costs associated with issuing more debt (**Myers 2001**)[4].

PECKING ORDER THEORY (POT)
The pecking order theory *(POT)*, on the other hand, gives a behavioural explanation of why certain companies follow a hierarchy in financing their *CS*. This theory also reflects on some rationale arguments, such as asymmetric information and signaling, as well as with flotation costs which are not explicated by the *STT*. The *STT* fails to predict the wide degree of cross-sectional and time variation of observed debt ratios which resulted in *POT* **Myers (1984)**[5]. Under the pecking hierarchy, firms prefer internal finance and when external finance is required, firms issue the safest security first. They start with debt, then possible hybrid securities such as convertible bonds then perhaps equity as a last resort. The *POT* explains why the bulk of external financing comes from debt and is consistent with the observation that the most profitable companies within an industry tend to have the least amount of leverage (*LEV*). This *POT* suits to large firms with high *P* and which has enough internal funds in the form of retained earnings and depreciation.
THEORIES IN THE LIGHT OF VARIOUS INDEPENDENT VARIABLES

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A number of empirical studies viz., **Harris and Raviv, (1991)** [6], **Titman and Wessels, (1988)** [7]; **Rajan and Zingales, (1995)** [8]; **Bevan and Danbolt (2002)** [9]; **Mary Hany A.K. Dawood El-Sayeda I. Moustafa and Mohamed S. El-Hennawi (2011)** [10]; **and Ali Mustafa Abdullah Al-Quda (2011)** [11] have identified firm-level characteristics such as size of the firm *(SIZ)*, asset structure *(COLASS)*, profitability *(P)*, growth *(GROW)*, volatility *(VOL)* and non-debt tax shield *(NDTXSH)* as variables influencing the *CS* of firms. These studies also considered these variables as the predictor variables determining the *LEV* of the firm.

(a) PROFITABILITY

TT predicts that, large profit earning firms should have debt capital to get the benefit of tax shield to mitigate the other cost incurred and therefore there exists a positive relation between *P* and *LEV*. And companies with high profit render high level of borrowing capacity, thus resulted in positive relationship of the variables. On the contrary, *POT* elucidates that, highly profitable firms, which have large internal funds available with them, choose to utilize their internal funds first and if external capital is required they choose to issue debt funds to avoid informational asymmetry. Therefore *LEV* decreases with increase in *P* (**Kester, C. W. (1986)** [12], **Titman, S.** *et al.* **(1988)** [13], **Barton, S. L.** *et al.* **(1988)** [14], **Pinegar, M. J.** *et al.* **(1989)** [15], **Harris, M.** *et al.* **(1991)** [16], **Harries, F. H. De B. (1994)** [17], **Rajan and Zingales (1995)** [18], **Jonson, S. A. (1998)** [19], **Simerly, R. L.** *et al.* **(2000)** [20], **Booth, L.** *et al.* **(2001)** [21], and **Fama and French (2002))** [22].

(b) GROWTH

According to *STT*, companies with high *GROW* have more risk and higher financial distress costs, thus growth has an inverse relationship with debt level. The *POT* predicts that high-growth firms, typically with large financing needs, will end up with high debt ratios because of the managers' reluctance to issue equity. **Smith and Watts (1992)** [23] **and Fama, E.F., and K. R. French (2002)** [24] also suggested that high-growth firms consistently use less debt in their *CS*. Therefore, the theory insists on a positive relation between *GROW* and *P*.

(c) COLLATERAL ASSETS

STT argued that higher level of fixed assets serve as collateral *COLASS* for debt financing and this will help the firms to easily access thus give a positive relationship between *COLASS* and debt level. **Myers (1984)** [25] also suggested that issuing debt secured by *COLASS* may reduce the asymmetric information related costs in financing. However, in the view of *POT*, as argued by **Harris and Raviv (1991)** [26], small firms with low level of fixed assets would have more problems of asymmetric information, making them issue more debt, since equity issues could be possible only by under pricing them. On the other hand, firms with higher level of *COLASS* are generally larger firms that can issue equity at fair prices and need no debt finance, therefore there exists a negative relation between *COLASS* and *LEV.*

(d) SIZE

Larger firms have diversified business and therefore have lower possibility of experiencing financial distress **(Titman and Wessels 1988)** [27], which causes for positive relationship between firm size (*SIZ*) and debt level in *STT* approach. **Frank and Goyal (2003)** [28], and **Rajan and Zingales (1995)** [29] argued that larger firms have lesser problem of asymmetrical information, reducing the chances of undervaluation of the new equity issue which encourages large firms to use equity financing, therefore there exists a negative relation between *SIZ* and *LEV*. The work of **Titman and Wessels (1988)** [30] also states that if there is a *SIZ* effect to debt, it will be higher for small firms.

(e) NON-Debt TAX SHIELD

Firms having higher non-debt tax shield (*NDTXSH*), such as R&D expenses or depreciation which reduce total taxable income, rarely introduce new debt into system since *NDTXSH* is more beneficial than tax-shield benefit derived from debt financing which increases the cost of financial distress **Huson Joher Ali Ahmed and Nazrul Hisham 2009** [31]. **Bradley, Jarrell and Kim, (1984)** [32], and **Harris and Raviv (1991)** [33] found empirical evidence of positive relation between *NDTXSH* and debt. **MacKie-Mason (1990)** [34] argument indicates that this relation is positive for profitable firms and negative for highly distressed firms.

(f) VOLATILITY

Bradley, *et al.* **(1984)** [35], **Kester (1986)** [36], and **Titman and Wessels (1988)** [37] proved that leverage increases with fixed assets, *NDTXSH*, growth opportunities, and firm size and decreases with volatility *(VOL).* Since firms with high earnings volatility have a higher probability of default, investors are less likely to provide financing to such firms.

OBJECTIVES OF THE STUDY AND HYPOTHESES DEVELOPMENT

With the controversial views in respect of the two different *CS* models, it is essential to study the determinants of *CS* in Beverage and Alcohol industry and to analyze the models that suit to the industry. Keeping this point in view, the following objectives are set.

- To study the determinants of *LEV* in beverage and alcohol industry in India.
- To analyze the relation between various determinants and *LEV* in beverage and alcohol industry in India.
- To find out the capital structure theory model that applies to beverage and alcohol industry in India.

HYPOTHESES

The hypotheses, for the purpose of testing the models applied in the industry are as follows:

(a) HYPOTHESES FOR TESTING STT

H_o^1: There is no significant relation between leverage and size in Beverage and Alcohol industry in India.

H_o^2: There is no significant relation between leverage and collateral asset in Beverage and Alcohol industry in India.

H_o^3: There is no significant relation between leverage and non debt tax shield in Beverage and Alcohol industry in India.

(b) HYPOTHESES FOR TESTING POT

H_o^4: There is no significant relation between leverage and profitability of Beverage and Alcohol industry in India.

H_o^5: There is no significant relation between leverage and growth of Beverage and Alcohol industry in India.

H_o^6: There is no significant relation between leverage and volatility of Beverage and Alcohol industry in India.

SOURCES OF DATA AND PERIOD OF THE STUDY

The study is based on secondary data, which are collected from Centre for Monitoring Indian Economy **(CMIE)** Prowess package for a period of 10 years on year to year basis ranging from 2000-2001 to 2009-2010 updated as on 7th April 2011.

SAMPLING DESIGN

Multistage sampling technique is used and the different stages followed are shown below:

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CHART A: MULTISTAGE SAMPLING TECHNIQUE

Stage 1
- Beverages and alcohol industry constitutes 174 firms grouped into two sectors 1) Tobacco products (35 firms) 2) Beer and Alcohol (139 firms).
- Firms with incorporation dates availability are alone considered in the first stage.
- Tobacco products- 29 firms
- Beer and Alcohol- 19 firms

Stage 2
- Firms with listing flag availability are considered for the next stage.
- Tobacco products- BSE-8; NSE-5
- Beer and Alcohol- BSE-27; NSE-10

Stage 3
- Firms with BSE listing flag constituting larger number of firms are taken in the next stage which includes 35 firms

Stage 4
- The final sample includes 21 firms having data available for the period under study

Source: Computed results based on compiled data collected from CMIE prowess Pvt. Ltd.

RESEARCH METHODS FOR ANALYSIS

Descriptive statistics such as mean, median and standard deviation are used to neutralize the fluctuation in the value of explained as well as explaining variables. Correlation co-efficient is extensively used to study one-to-one relationship between variables. Multiple regression is also used to determine the various variables that influence the *LEV* in the firms. Appropriate ratios as stated below are used to calculate individual relative properties of the selected variables.

TABLE 1: DESCRIPTION OF MEASURES (RATIOS) USED

Variables	Description	Inference
LEV	Long term debt/Book value of equity	A high value denotes high leverage in terms of long term debt and vice versa
P	PBITD/Fixed Assets	A high value denotes higher profitability in terms of fixed assets
NDTXSH	Ratio of the sum of depreciation and amortization / Total Assets	A high value denotes a higher non debt tax shield and vice versa
COLASS	Ratio of Property, Plant and Equipment / Total Assets.	A high value denotes higher share of fixed asset to total asset, which implies greater share of assets is invested for increasing earning and vice versa
SIZ	Logarithm of Sales over Years	Turnover adjusted for fluctuation over years
GROW	Compounded annual growth rate (CAGR) of total assets	The growth of total asset over years
VOL	Standard deviation of earnings before interest, taxes and depreciation (EBITD) / Total Assets	A high value denotes greater volatility in earnings from the assets invested and vice versa

REGRESSION EQUATION

Titman and Wessels (1988), who measured *CS* simultaneously by the ratios of long-term debt, short-term debt, and convertible debt to the market value of equity found that long-term debt is the most important proxy of capital structure, followed by short-term debt, and then convertible debt. Therefore, this study assumes long-term debt to equity capital as proxy for *LEV*.

EQUATION

$$LEV = \alpha + \beta_1 VOL + \beta_2 COL\,ASS + \beta_3 NDT\,XSH + \beta_4 P + \beta_5 SIZ + \beta_6 GROW + \epsilon$$

INDUSTRY ANALYSIS AND FINDINGS

The various explaining variables, the expected sign indicating the kind of relation with *LEV* and the theory supporting the relation between independent and dependent variables are shown in *table 2* which forms the basis for the results of analysis to be compared.

TABLE 2: PREDICTOR VARIABLES, EXPECTED SIGN AND SUPPORTING THEORY

Variables	Expected sign	Theory	Proxy
VOL	Negative	Pecking order	Standard deviation of earnings before interest, taxes and depreciation (EBITD) / Total Assets
COLASS	Positive	Static trade-off	Ratio of Property, Plant and Equipment / Total Assets
NDTXSH	Positive	Static trade-off	Ratio of the sum of depreciation and amortization / Total Assets
P	Negative	Pecking order	PBITD/Fixed Assets
SIZ	Positive	Static trade-off	Logarithm of Sales over Years
GROW	Positive	Pecking order	Compounded annual growth rate (CAGR) of total assets

The descriptive statistics show that *(see table 3)* there is negative sign in the minimum value of *P*, indicating that firms incurring loss are also included in the sample size. *LEV* shows the highest standard deviation (5.145) proving that there are varied level of leveraging policy followed by the firms belonging to

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beverage and alcohol industry. The *SIZ* show the next highest level of mean value (2.166) and the standard deviation (.807) is also high, indicating that the firms vary in their turnover size.

TABLE 3: DESCRIPTIVE STATISTICS OF BEVERAGE AND ALCOHOL INDUSTRY IN INDIA

Variables	N	Minimum	Maximum	Mean	Std. Deviation
LEV	21	.350	16.330	5.171	5.145
VOL	21	.016	.318	.066	.066
COLASS	21	.165	.752	.395	.176
NDTXSH	21	.007	.062	.029	.015
P	21	-.134	.740	.283	.234
SIZ	21	.777	4.208	2.166	.807
GROW	21	-.125	.418	.084	.129

Source: Computed results based on compiled data collected from CMIE prowess Pvt. Ltd.

The correlation results show that *(see table 4) GROW* alone has significant (at 5%) positive correlation (.544[*]) with *LEV*, supporting the *POT*. Therefore, growing firms have insufficient internal funds to finance their opportunities and depend on debt funds, which is the next choice in the pecking hierarchy to avoid informational asymmetry. The hypothesis "H_o^5: there is no significant relation between leverage and growth" is rejected. Hence, there is a significant relation between *LEV* and *GROW* of Beverage and Alcohol industry in India.

TABLE 4: CORRELATIONS OF DETERMINANTS OF *CS* OF BEVERAGE AND ALCOHOL INDUSTRY IN INDIA

Variables	LEV	VOL	COLASS	NDTXSH	P	SIZ	GROW
LEV	1						
VOL	.068 .771	1					
COLASS	-.421 .057	-.233 .309	1				
NDTXSH	-.151 .514	-.155 .502	.724[**] .000	1			
P	.181 .431	-.180 .435	-.565[**] .008	-.519[*] .016	1		
SIZ	.339 .133	-.411 .064	-.202 .379	-.295 .194	.655[**] .001	1	
GROW	.544[*] .011	-.168 .465	-.413 .063	-.350 .120	.574[**] .006	.488[*] .025	1

Source: Computed results based on compiled data collected from CMIE prowess Pvt. Ltd.
*. Correlation is significant at the 0.05 level (2-tailed).   **. Correlation is significant at the 0.01 level (2-tailed).

The regression results show that *(see table 5) COLASS* (-20.758) and *P* (-14.016) have significant (at 5% level) negative co-efficient with *LEV*, supporting the *POT*. The profitable firms choose to use their internal funds rather than opting for borrowing through equity capital which reduces the value of equity. The results coincide with the findings of **Harris and Raviv (1991).** Firms with higher levels of *COLASS* are large firms that can issue equity at fair prices and need no debt finance. Therefore, there exists a negative relation between *COLASS* and *LEV.* The hypotheses H_o^2 and H_o^4 are rejected in support of *POT*.

SIZ (3.464) and *GROW* (20.694) have significant positive co-efficient with *LEV*. Thus growing firms rely on debt capital when their internal funds get exhausted supporting *POT*. *SIZ*, on the contrary, shows a positive relation supporting the *STT*. The firms having higher turnover have lesser problem of financial distress and so have more debt capital. This relation can be better explained with the argument of **Titman and Wessels (1989)**, who stated that the relation of *SIZ* to debt will be higher for small firms. Therefore, H_o^5 is rejected in support of *POT* while H_o^1 is rejected in support of *STT. NDTXSH* and *VOL* have insignificant role in determining the *LEV*. Hence, H_o^3 and H_o^6 are accepted. The R^2 (0.601) value is over 60%, indicating that the regression model determines over 60% of variance in *LEV* while the remaining 40% is determined by other variables. The F stat value (3.508) is also significant at 5% level, indicating that the variance in the dependent variable is explained by variance in independent variables.

TABLE 5: REGRESSION EQUATION ON *LEV* OF BEVERAGE AND ALCOHOL INDUSTRY IN INDIA

Variables	Coefficients	Std. Error	t value	p value
(Constant)	3.398	5.058	.672	.513
VOL	12.578	15.760	.798	.438
COLASS	-20.758*	8.245	-2.518	.025
NDTXSH	134.065	84.883	1.579	.137
P	-14.016*	6.263	-2.238	.042
SIZ	3.464*	1.613	2.148	.050
GROW	20.694*	8.560	2.418	.030
R^2	0.601			
Adj-R^2	0.429			
F Stat	3.508* (0.025)			

Source: Computed results based on compiled data collected from CMIE prowess Pvt. Ltd.

DISCUSSION ON RESULTS

The *table 6* indicates that *POT* is the model supported with regard to *COLASS, P* and *GROW* and the positive relation between *SIZ* and *LEV* supports *STT* as justified by **Titman and Wessels (1988)**. But, the firms showing greater turnover are growing firms with upcoming opportunities and therefore have to rely on

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debt capital rather than equity capital supporting in real the **POT**. The significant positive relation between **SIZ** and **GROW** (*see table 4*) also supports this inference about the positive relation between **SIZ** and **LEV**. In general, the **POT** model is followed by firms in beverage and alcohol industry in India.

TABLE 6: THEORY SUPPORTED BY VARIOUS FINANCIAL VARIABLES IN BEVERAGE AND ALCOHOL INDUSTRY IN INDIA

Variables	Expected sign	Observed sign	Theory supported
VOL	Negative	Positive	-
COLASS	Positive	Negative*	Pecking order
NDTXSH	Positive	Positive	-
P	Negative	Negative*	Pecking order
SIZ	Positive	Positive*	Pecking order
GROW	Positive	Positive*	Pecking order

CONCLUSION

India, being the largest producer of world's whisky market and with the forecasted growth rate of 12.2% during 2007 to 2011 in consumer expenditure on food, beverages and tobacco, the study of their **CS** has put forth interesting results about their leveraging policy. The two controversial approaches (**STT** and **POT**) to **CS** are discussed in this study to find out the model that is significantly applied in Indian beverage and alcohol industry. It has been found that the firms follow **POT** model and therefore follow the pecking hierarchy of **Myers (1984)** in financing their **CS**. Debt capital is given more importance to avail the tax benefit and to avoid the information asymmetry problem. They do not fix a target optimal level of debt equity ratio and try to reach it, thus **STT** fails in the Indian perspective. **COLASS** followed by *P* are considered as important determinants of **LEV** as they have comparatively large 't' values, however **NDTXSH** and **VOL** are found to be insignificant in determining **LEV**.

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