



**INVESTIGATING DETERMINANTS OF CAPITAL STRUCTURE  
A CASE OF PAKISTANI FOOD, BEVERAGES AND TOBACCO FIRMS**

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**ABSTRACT:**

*The objective of this paper is to empirically look into the determinants of capital structure for food, beverages and tobacco firms of Pakistan. For this purpose leverage is taken as response variable while profitability, firm size, growth opportunity, tangibility, non-debt tax shield, taxes, liquidity, payout ratio, volatility and uniqueness are chosen as stimulus. This paper employs new data base from market and accounting data from Karachi stock exchange listed 18 food, beverages and tobacco companies for the year 2006-2011. From the author's knowledge it's a first study that explores the determinants of capital structure specifically for food industry of Pakistan. Moreover, this study includes nine variables including one new variable uniqueness as stimulus which was not included in any previous study regarding Pakistan.*

*JEL classification: G32*

**1. INTRODUCTION:**

Capital is considered as the keystone of a firm's financial strength since it supports operations by providing a shield against unanticipated losses from its activities and, in the event of problems, enabling the firm to continue to operate in a sound and feasible manner while the problems are addressed or

resolved. To finance its assets, firm use different level/ mixes of debt and equity or other arrangements. This refers as capital structure of firm. In order to get most out of this, firms differ with respect to capital structures. The decision of capital structure is on of the chief decision in financial management. This decision is integral to many other decisions in the vicinity of corporate finance. Capital structure is an important tool to manage cost of capital. The minimum cost of capital is at the point where capital structure reached its optimal level. Is such an optimal capital structure exists? What are the possible determinants of such an optimal capital structure? Do the determinants that affect structure of capital in further industry have alike impacts on capital structure of food industry? These questions are to be answered by a researcher in this paper.

## **2. THEORITICAL FRAMEWORK & EMPERICAL EVIDENCES:**

Researchers made efforts in the past to develop financial theories for the purpose of explaining how to make decisions regarding capital structure. Various theoretical models were proposed to elucidate patterns of capital structure and give empirical basis for these theoretical models. The related literatures propose that the attributes that establishing various costs and benefits connected with debt and equity financing are responsible for decision of selection of capital structure of firm. Some of the important theories are:

### **2.1 . IRRELEVANCE THEORY (1958):**

This theory was proposed by Modigliani and Miller (1958). Since their paper was presented the issue of capital structure received great interest among financial researchers. They stated that firm's market value is not dependent on its structure of capital and is provided by its expected return' capitalizing at the rate of  $\rho$  suitable to its risk class. In other words the technique of financing is inappropriate. Despite the fact that the irrelevance theory is proposed by assuming various impractical assumptions, yet it provides essential theoretical background for further research.

### **2.2. AGENCY THEORY (1976):**

This theory was put forward by Jensen and Meckling (1970). They developed agency cost hypothesis and spot the two types of disagreement, consists of disagreement between managers and shareholders and

second is between equity holders and debt holders. Hypothesis suggests that managers are focused to maximize their own benefits. Therefore, stockholders try to discourage their interest by means of monitoring and control actions which also prospects cost known as agency cost.

### **2.3. SIGNALLING THEORY (1977):**

Ross in 1977 had originally developed this approach, proposed that debt can be thought to consider investor's trust in the company. Managers have considerable knowledge about distribution of income hence when they give favorable indication to market by issuing debt this activity provides the basis to think that in the future firm is likely to do positive cash flows and is capable of paying the installment (periodic) and interest payments. Thus this suggested that manager's self assurance on future cash flows is a function of higher level of debt.

### **2.4. PECKING ORDER THEORY (1984):**

In 1984 Myers and Majluf presented the theory which suggested that firms use their retained earnings as mode of financing for their projects and if retained earnings are not sufficient then they prefer bank loan and then public debt both these are called external financing. As a last remedy, firms consider issuance of equity to finance their need. It also argues that firms do not have any desirable level of debt to its market value expressed as percentage.

### **2.5. TRADE-OFF THEORY (1988):**

The theory was presented by Titman (1988). It proposed that firm sets target debt and equity ratio by balancing costs and benefits according to the nature and requirement of project and gradually moves to achieve it. It also assumes that firm's value is maximized by equity ratio and target debt and decreases external claims.

### **2.6 EMPIRICAL EVIDENCES:**

Numerous studies have inspected the empirical validity of these theories, but no concurrence has been accomplished so far. Studies like Myers (1984), Titman and Wessel (1988), Rajan and Zingales (1995), Wald (1999), Mira (2002), Daskalakis and Psillaki (2005), Mazur (2007), Serrasqueiro and Ragao (2009), etc for developed economies and Kester (1986), Allen and Mizuno (1989), Booth et al.

(2001), Bhaduri (2002), Delcoure (2007), Chakraborty (2010), etc for developing economies are noteworthy but findings of these empirical studies do not show the way towards the consensus regarding significant determinants of capital structure.

In the circumstances of Pakistan limited work has been done. Shah and Hijazi (2004) were the first to conduct the study for Pakistan. Afterward, past research work was extended by Shah and Khan (2007). Some work have been also done for specific non-financial industries of Pakistan like Hijazi and Tariq (2006) worked on data relating to cement industry, Rafiq et al. (2008) investigating using data relating to chemical.

### **3. RESEARCH METHODOLOGY:**

#### **3.1 DATA SET:**

Different conditional theories and previous studies have been studied for the purpose of formulating testable hypothesis relating to the determinants of capital structure. This study uses State bank of Pakistan (SBP) publication “Financial Statement Analysis Of Companies (non financial) Listed at Karachi stock Exchange (2006-2011)”. Firms having missing observations of any variable during the research period have been excluded. Hence, a balanced panel of 18 food, beverages and tobacco firms are included. As listed firms can represent whole food industry of Pakistan so it may do well in capturing total leverage of this industry in Pakistan.

Table 1 represents the statistical summary of whole data. The average value of total leverage is 0.7399 which is much above the average leverage as it ranges from 0 to 0.99, indicating that food industry of Pakistan has high leverage. Reason behind may be that food firms are capital intensive and requires high tangible assets such as machinery, equipments etc for operations so finally required high debt ratio. Profitability has mean value of 0.146 i.e. 14.6% which is quite low as it's obvious with such a high leverage. The mean value of firm size and growth are 14.40 and 25.43 respectively. This increasing value

is mostly due to increasing food material's prices and inflation. additionally the average value of tangibility is 0.778; proposing food firms have high tangible assets so they can serve as collateral for raising debt financing. The mean value of non-debt tax shield is 0.037, showing that 3.7% of total assets (T.A) estimated to reduction every year. 3.7% can be consider moderate because as fixed assets accounts for 77.8%. This highlights that food firms can depend on non-debt tax shield, since it decreases incomes before taxes. Ultimately, low taxable income means little tax payments. Tax had an average value of 0.311, suggesting that 31.1% of income before tax is paid as tax by food industry which is quite high as compare to the other non-financial firms discussed by Fawad et.al (2011). It is may be due to the reason that food firms shows quite true values of raw material and sales which other non-financial firms implicitly hides. The mean value of liquidity is 1.172, suggesting that after payment of their current liabilities they still had 0.172 of surplus current assets. So it can be said that firms had excess cash and they can easily meet their current portion of long term liabilities. Uniqueness has a mean value of 0.051, which may be consider high. This 5.1% value suggesting that food firms producing relatively unique and or specialized products.

Table 2 presents correlation matrix among all variables. Highest correlation is between leverage and tangibility i.e. 0.91. This indicates that firms with high fixed assets tend to have high debt ratio as more debt is required to finance these assets. All other correlations are below average, indicating less presence of multicollinearity problems facing in the OLS regression.

### **3.2 VARIABLES:**

This study uses total debt over total assets as alternate for leverage as the dependent variables. A firm is said to be highly leveraged it has high debt. Both deduction and induction approach studies have proposed that profitability, tangibility, size, growth, tax, non –debt tax shield, risk is potential determinants capital structure. This paper however involves nine determinants including liquidity and uniqueness as well. Table 3 represents the summary of determinants of capital structure, their operational definitions,

theoretical predicted signs and empirical evidences. Priori relationship among dependent and independent variables may explain as:

### **3.2.1 PROFITABILITY:**

Numbers of work have been done since Modgilliani and Miller (1958). No consistent relationship has been found between profitability and financial leverage. In view of pecking order theory as mentioned above firms prefers retained earning at the top to finance their projects, and then go for external financing if needed. At last they will issue equity to finance. Myers(1984) predicts inverse association of profitability and leverage as described by pecking order theory. Jensen and Meckling(1970) predicts direct association in case of if market for corporate control is efficient. But if it is ineffective, they predict negative relationship between profitability and leverage.

### **3.2.2 SIZE:**

Many studies suggest that leverage increases with the value of the company. It has been suggested that direct bankruptcy costs emerges to comprise a larger share of a value of firm as that value reduces. It has been also argued that larger companies try to have more broadened views and, thus, less level to bankruptcy (Rajan and Zingales 1995). Further, reason that due to having lower leverage ratio, smaller firms are more subject to be liquidated in the period of financial anguish (Ozkan 1996).

### **3.2.3 TANGIBILITY:**

Expected relationship between tangibility and leverage ratio is positive because firms with more tangible assets have an enticement to borrow more due to the relatively cheaper availability of loans. Tangible

assets can be used as collaterals which can protect them in the situation of financial distress (Jensen M, 1970). Important, significant from zero and direct association between tangibility and leverage ratio has been reported by Titman and Wessels(1988) and Rajan and Zingales (1995).

### **3.2.4 NON-DEBT TAX SHIELD:**

Non-debt tax shield is the tax deduction for depreciation and investment tax credits. Firms with large non-debt tax shield will issue less debt. Hence it has positive effect on leverage ratio. It has been argued that non-debt tax shields are substitute for the tax benefits of debt financing But still literature is indecisive whether it has positive effect on leverage ratio because non-debt tax shield associated with depreciation expenses exhibits a positive relationship suggested by Delcoure( 2007) or may be negative indicated by De angelo (1980).

### **3.2.5 TAXES:**

Firms trying to acquire a tax shield by using more debt having greater effective marginal tax rate. Many studies failed to prove the significant impact of taxes which is entailed by Modgilliani and Miller(1958) theorem because debt-equity ratio are the cumulative result of year's and most tax shields have negligible impact on marginal tax rate for most firms(Guihai huang, 2006). Mackie-Mason (1990) studies incremental financing decision and finds that the desirability of debt-financing varies positively with the effective marginal tax rate.

### **3.2.6 LIQUIDITY:**

Liquidity may have both effects on leverage i.e. positive or negative. Positive in a way that more liquid firms may support higher debt ratio because their capability to meet short term liabilities when they fall. On the contrary, firms with greater liquid assets first use its internal funds to finance their investment. Hence, it exerts negative impact on its leverage ratio.

### **3.2.7 UNIQUENESS:**

Titman and Wessels (1958) says in their study that the judgment of liquidation of firm is normally connected with firm's status of bankruptcy. Due to which cost incurred by firm is relevant to its capital

structure decision. The workers and suppliers of these firms which are producing relatively unique products have high level of job specific skills and capital so they suffer high cost in the event that they liquidate. For these causes individuality has expected to be inversely connected with leverage.

In case of Pakistan there is no paper which analyzes uniqueness as determinants of capital structure due to limitation of data. But for food industry selling expense data for recent years are available.

### **3.2.8 RISK:**

Business risk can be measured variation in income. Mackie-Mason (1990) argued that if variation in income is high it means that the likelihood of bankruptcy increases. So it is expected that firms with high income variability have low leverage ratio. Mackie-Mason (1990)

### **3.2.9 GROWTH:**

Pecking order theory assumes positive relationship between leverage and growth. Theory suggests that the requirement of high capital by growing firms cannot be meet through internal funds only so companies' external borrowing which creates the results in level of leverage. On the other hand, Myers (1977) argues that high growth firms may have more future investment opportunities but with outstanding debt, firms' have to sacrifice some of these future options for the reason that such an investment relocates wealth to debt holders by stockholders. So high growth firms may not prefers to issue debt, hence negative relationship is expected between leverage and growth.

### **3.3 METHODS AND MODEL:**

This study uses balanced panel data relate to firms over time, which allows the unobservable heterogeneity to be eliminated and multicollinearity to be alleviated. The trouble that may be occurs in the regression model like heteroskedasticity, multicollinearity, etc. These problems may cause inconsistency of the OLS estimators.

As can be seen in table 2 most cross-correlation between stimulus are small, indicating less causes of presence of multicollinearity situation. Moreover,

The basic model is as follow:

$$Y_{it} = \alpha + X'_{it}\beta + \varepsilon_{it} \quad (1)$$

$Y_{it}$  is dependent variable leverage for the  $i$ th firm over at the time  $t$ ,  $\alpha$  is intercept,  $X'_{it}$  is set of regressors for the each individual firm in the  $t$ th time period,  $\beta$  is a parameter for explanatory variables and  $\varepsilon_{it}$  is the disturbance term equals to  $\mu_{it} + v_{it}$ , where  $\mu_{it}$  is the firm specific error component and  $v_{it}$  is the combined time series and cross section (firms) error component.

This study utilizes three estimations i.e. pooled OLS, fixed effect and random effect. The Breusch-Pagan test results 63.3 ( $p$ -value 0.0000) indicates that variances among covariates are not constant. Hence pooled OLS is rejected.

Fixed effects model assumes that error term and the independent variables are correlated, whereas random effects model assumes that error term and independent variables are uncorrelated. The Hausman specification test is applied to test the fixed effect versus random effect model. The test result is statistically significant. Thus, random effect is rejected in favor of fixed effect. The regression model is specified as follow:

$$LVG_{it} = \beta_1 + \beta_2 PROF + \beta_3 TANG + \beta_4 SIZ + \beta_5 GRO + \beta_6 TAX + \beta_7 NDT + \beta_8 RIS + \beta_9 UNI + \beta_{10} LIQ + \mu_{it} \quad (2)$$

Where  $\beta_1$  = intercept;  $\beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}$  = slope coefficients

$\mu_{it}$  = residual term;  $i$  = cross sectional unit;  $t$  = time period

LVG= leverage; PROF= profitability; TANG= tangibility; SIZ= size; GRO=growth; TAX= tax;

NDT= non-debt tax shield; RIS= risk; UNI= uniqueness; LIQ= liquidity

### 3.4 RESEARCH QUESTION AND HYPOTHESIS:

The research question will be answer from this study will be:

*Do the factors that affect cross-sectional variability of capital structure in other countries have similar effects on Pakistani food, beverages and tobacco firms' capital structure?*

Hypotheses to be tested:

Hypothesis v1: *Profitability and leverage are inversely related.*

Hypothesis v2: *Tangibility and leverage are positively related.*

Hypothesis v3: *Size and leverage have positive relationship.*

Hypothesis v4: *Growth is inversely related to leverage.*

Hypothesis v5: *Taxes have positive effects on leverage.*

Hypothesis v6: *Non-debt tax shield has negative effect on leverage.*

Hypothesis v7: *Risk is negatively relate with leverage.*

Hypothesis v8: *Uniqueness and leverage have inverse relationship.*

Hypothesis v9: *Liquidity has negatively related with leverage*

### **3.5 FINDINGS:**

Table 4 represents the regression results for leverage. Table reports results for both fixed effect as well as random effect. If we compare the results of fixed effect and random effect, almost same conclusion is seen on the basis of significance of parameters. R-squared value is 0.94 indicating that 94% of variation in dependent variable is explained by independent variables used. The profitability, tangibility, non-debt tax shield, uniqueness and growth appear to be statistically significant while, size, taxes, liquidity and risk are statistically insignificant.

The result shows positive significant relationship between profitability and leverage. This positive relationship is supported by trade-off theory. The theory argues that high profitability is associated with improved good will of the firm, decrease agency and information asymmetric cost and free cash flows. Hence, firm's ability to pay back loans increases. The tangibility coefficient for leverage is positive and different from zero that means higher tangibility is linked with higher leverage. This relationship is maintained by trade-off theory and the argument is obvious that tangible assets serve as collaterals. Hence it is a source of security for lenders. Tangible assets as collaterals normally reduce lender's risk so

associated with high leverage ratio. The third significant variable is non-debt tax shield. Relationship is negative as expected. The argument is that existence of non-debt tax shield minimizes the firm's debt tax benefits which negatively affect the firm's debt level. So firms with high non-debt tax shield will have low level of leverage. The coefficient of growth found to be positive and statistically significant. Pecking order theory supports this relationship as growing firms requires high capital so they need more debt to finance their operations resulting in high leverage ratio. The last significant coefficient found in this study is of uniqueness. Negative relationship between uniqueness and leverage has been found. The firms having unique assets have low expected value of recovery by a lender if it bankrupts.

#### **4. CONCLUSION:**

In the last five decades there has been significant theoretical and empirical prominence given to capital structure determinants as they apply to corporate finance. This study attempts to empirically investigate the potential determinants of capital structure for food, beverages and tobacco firms of Pakistan. Previous empirical studies have shown that determinants of capital structure are more industry specific. So this study undertakes food industry to explore as it is the one of the important industry of Pakistan. The motivation for this study is that food, beverages and tobacco industry weights 12.37% of large scale manufacturing industry of Pakistan, grows 7.30% in 2012-13. As restaurants and fast food chains are prosperous in the country. The demand for dairy products, processed food and beverages has increased sharply thus brought positive impact on food group. Hence, optimal capital structure is required to make this industry grow and prosper which depends on its determinants.

This study empirically find positive and significantly from zero association between profitability, tangibility and growth as well as inverse connection of non-debt tax shield and uniqueness with leverage. Size, taxes, liquidity and risk found to be unrelated with leverage in case of food industry of Pakistan. The relationship between profitability, tangibility and leverage is consistent with trade-off theory and relationship between growth and leverage is consistent with pecking order theory.

On the basis of this study more detailed evaluation addressing determinants of capital structure of food industry of Pakistan can be done as it provides some underpinning. Moreover, corporate managers can get help from its empirical finding in order to make optimal capital structure decision.

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TABLE 1: Summary of determinants of capital structure, their operational definitions, theoretical predicted signs and empirical evidences

proxy	operational definitions	theoretical predicted signs	empirical evidences
Profitability	Profit before tax/ total sales	Positive/ Negative	Positive: Kester (1986), Titman and Wessel (1988), Rajan and Zingales (1995), Ahmad et al. (2011)*
			Negative: Lang and Malitz (1986), Baskin (1989), Dobers and fix (2003), Shah and Hijazi (2004)*, Shah and Khan (2007)*, Walliulah and Nishat (2008)*
Firm size	Natural log of sales	Positive/Negative	Positive: Myers and Majluf (1984), Titman and Wessel (1988), Honaifer et al. (1994), Shah and Hijazi (2004)*, Jong (2007)
			Negative: Ferri and Jones (1979), Kim and Sorensen (1986), Chung (1993), Mazur (2007), Shah and Khan (2007)* Chakraborty (2010), Ahmad et al. (2011)*
Tangibility	Fixed assets/ total assets	Positive	Positive: Scott (1977), Titman and Wessel (1988), Shah and Hijazi (2004)*, Walliulah and Nishat (2008)*, Chakraborty (2010), Ahmad et al. (2011)*

Non debt tax shield	Depreciation/ total assets	Negative	Positive: Shahjahanpur et al. (2010), Chakraborty (2010)
			Negative: Bowen et al. (1982), Kim and Sorensen (1986), Huang and Song (2006)
Taxes	Total tax/ earning before tax	Positive	Positive: Mackie (1990), Huang and Song(2006), Jong (2007)
Liquidity	Current assets/ current liabilities	Negative	Negative: Mazur (2007), Shahjahanpur et al.(2010), Ahmad et al. (2011)*
Uniqueness	Selling expense/sales	Negative	Negative: Harris and Raviv (1991), Chang et al. (2005)
Risk	Deviation from mean of net profit/total no. of years	Negative	Negative: Bradley et al. (1984), Mackie and mason (1990), Wald (1999), Delcuore (2005), Sheikh and Wang (2011)*
Growth	Percentage change in total sales	Positive/Negative	Positive: Marsh (1982), Cassar and Holmes (2003)
			Negative: Shah and Hijazi (2004)*, Hijazi and Tariq (2006)*, Jong (2007), Walliulah and Nishat (2008)*

“\*\*” represent studies in the context of Pakistan



TABLE 2: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
lev	108	.7399968	.9245353	.1290907	9.133517
prof	108	.1462007	.7219369	-3.474686	6.413451
size	108	14.40487	2.404995	0	17.98719
tang	108	.7783922	.8033977	.1837818	7.436285
ndts	108	.0378748	.0326128	.0003353	.2043483
tax	108	.3117252	.4579427	-.5675564	4.438166
liq	108	1.172448	.6953283	.0243997	4.265984
uniq	108	.0517415	.0863748	0	.5854664
risk	108	-.0061728	107357.3	-381613.5	440255.2
gro	108	25.43333	37.69856	-70	264

TABLE 3: Correlation matrix

	lev	Prof	siz	tang	ndts	tax	liq	uniq	risk	gro
Lev	1.0000									
prof	0.0091	1.0000								
Siz	-0.3405	-0.1231	1.0000							
Tang	0.9098	-0.0060	-0.3209	1.0000						
Ndts	-0.1245	-0.0398	0.1995	0.0384	1.0000					
Tax	-0.0517	-0.0720	0.1007	-0.1161	-0.1129	1.0000				
Liq	-0.3397	-0.1516	0.1656	-0.2989	-0.1384	0.1260	1.0000			
uniq	0.2170	-0.0194	0.0567	0.1742	-0.0687	-0.0298	-0.0425	1.0000		
Risk	-0.0249	0.0487	0.0514	-0.0416	-0.0742	-0.0034	0.0172	0.1562	1.0000	
Gro	0.3710	0.1037	-0.2028	0.2289	-0.2798	-0.0933	-0.0602	0.1529	0.0400	1.0000



Table 4: Regression results

	Pooled OLS	Fixed effect	Random effect
prof	-.0202511 (.0457193)	.0546187** (.0284788)	.0283129 (.0337751)
siz	-.0032453 (.0148947)	.0163973 (.0153425)	.0083583 (.0147192)
tang	.9786217 (.0457742)	1.093013* (.0313536)	1.059883 (.0360402)
ndts	-3.497616 (1.079786)	-3.017519* (1.208509)	-3.32473 (1.100149)
tax	.1199251 (.0719691)	.0622662 (.0489202)	.0805934 (.0566976)

liq	-.1345389 (.0498283)	-.0204586 (.0497223)	-.075084 (.0487832)
uniq	.410136 (.3896026)	-.5564212** (.2646102)	-.2602471 (.3031575)
risk	-5.99e-08 (3.05e-07)	7.22e-08 (1.82e-07)	3.16e-08 (2.19e-07)
gro	.0033242 (.0009328)	.0015475** (.0007343)	.0022875 (.0007937)
_cons	.1750151 (.2328118)	-.2466855 (.2391995)	-.0654286 (.2317129)
R square	.8819	.9435	.9402

Standard errors are in parenthesis. \*significant at 1%, \*\* significant at 5%, \*\*\*significant at 10%

