The Relationship between Ownership Structure and Capital Structure: Evidence from Chemical Sector of Pakistan

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Abstract

Objective – The main objective of this study is to measure the relationship between ownership structure and capital structure by using the chemical sector of Pakistan.

Design – This study is used the panel data and retrieved from the annual reports of the chemical sector of Pakistan for the time period of 2012 to 2017.

Findings – The finding the statistical analysis shows that ownership structure has a significant positive relationship on capital structure. Which mitigate the agency conflicts among managers and shareholders, because the majority of the shareholders would like to have a higher level of debt over equity financing.

Policy Implications – The findings of this study also can be helpful to the policymakers, investors and financial institution in designing ownership structures and financing decisions for firms.

Originality – This is the first study that examined the relationship between ownership structure and capital structure in the context of the chemical sector of Pakistan.

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Introduction

Nowadays, capital structure decision has become a subject matter in the field of corporate finance (Saona, San Martín, & Jara, 2018). Capital structure means how a firm is financing on its overall operations and growth by using different sources of funds (Ahmad, Saboor, & Nouman, 2018; A. Shah & Khan, 2007). It is the combination of both debt and equity financings and at the same time, it also reduces the cost of capital (Haron, 2018). Debt may be occurred in various forms like as issuance of bonds and note payable, while equity may have come in form of common stock, preferred stock and or retained earnings (Ahmad et al., 2018).

Capital structure is also concerned with the financial structure decision of a firm. The capital structure decisions of a firm are very crucial because it referred to the ability of a firm and also fulfill the requirements of its stakeholders (Bajagai, Keshari, Bhetwal, Sah, & Jha, 2019). Its formation is also very important for every business organization (Turan & Hasanaj, 2014) that generate growth and firm valuation (Voulgaris, Asteriou, & Agiomirgianakis, 2004). Firms having a higher growth rate are more profitable for business than other firms. Because these firms are more successful due to high-risk investment activities (Grewatsch & Kleindienst, 2017). Growth is a generic strategy of a firm to increase its long term performance. Long-term performance is a very critical decision for every business success in a competitive environment (Ghorbal-Blal, 2008).

Optimal capital structure can maximize the value of the firm and minimize the cost of capital (Arulvel & Ajanthan, 2013). It becomes very difficult for financial managers to examine the proper use of the optimal capital structure for any organization. So, the major discussion on the corporate capital structure was started by (Modigliani & Miller, 1958) through Irrelevance theory. According to this theory, there is a perfect capital market and usually firm has its independent value on corporate capital structure. But a few years later, extensive research has been done and it was explained that financial leverage also affects the value of the firm due to its tax-shield benefits. Firms with higher debt level bear low tax expenses and this may reduce the weighted average cost of capital. Agency theory by (Jensen & Meckling, 1976) recognizes that the proper use of capital structure can resolve the conflicts of interests among managers and shareholders. The Trade-off theory (Myers, 1977) describes the gap of Irrelevance theory, that contains on the advantages and disadvantages of capital structure. In contradiction of Trade-off theory, Pecking-order theory may not consist of the optimal capital structure decision and simply it reduced the information asymmetry. Consequently, (Myers, 1984) stated that firms prefer to internal funds on external funds of equity financing.

Although there are many previous studies that have examined the association of ownership concentration and capital structure (Bunkanwanicha, Gupta, & Rokhim, 2008; Q. Liu, Tian, & Wang, 2011). But in Pakistan, many studies have particularly focused on corporate governance and capital structure decisions (Ahmad et al., 2018; Ahmed Sheikh & Wang, 2012; M. H. Shah, Zuoping, Abdullah, & Shah, 2018).

Capital structure decisions are also influenced by ownership structure variables (Bajagai et al., 2019). However, the ownership concentration is commonly used throughout the world that plays a significant role in the firm's capital structure decisions and also on corporate governance practices. Ownership concentration is concerned with the number of shares owned by individuals and largest block shareholders (as at least 5% of equity ownership hold by top shareholders of the firm) (Paramanantham, Ting, & Kweh, 2018). Ownership concentration has a great influence on capital structure decision-making policies (Bany-Ariffin, Nor, & McGowan Jr, 2010; G. Liu & Sun, 2010). So this research has been conducted to fulfill the existing of research gap; in order to examine the relationship between ownership structure and capital structure.

There are some contributions to the literature. First, it analyzes the nature of capital structure decisions, which resolves the issues of stakeholders of firms; likes as a shareholder, managers, and debt holders. Second, it

covers the shortage of empirical studies in contributing to the relationship between ownership structure and capital structure. This study will be helpful for the investors to create such portfolios, which give them maximum profit. This study will also important and enable the investors on how to choose an appropriate capital structure decisions and ownership structures of the firm.

Literature Review

Discussion on financial structure started by (Modigliani & Miller, 1958), with the concept of three other theories. First and foremost discussion of financial structure argued by (Modigliani & Miller, 1958), who explained the concept of irrelevance capital structure theory. It states that capital structure does not affect to firm value. This shows that an increase in debt level has no significant impact on the cost of capital. They further assumed that in the perfect capital market, there is no tax charged, no bankruptcy cost, no transaction cost, and information asymmetry among the participants of capital structure. However, in the real world, there are taxes, transaction cost, and bankruptcy costs, etc. Therefore, the above assumption was finding unrealistic because it has not shown any significant impact on optimal capital structure (Marobhe & es Salaam-Tanzania, 2014). In later, the theory was concluded that capital structure has an impact on firm value due to tax shield benefits which reduce the value of debt and increase the firm performance.

Trade-off theory is an expansion of MM theory. It suggests that firm optimal capital structure affected by firm taxes, transaction cost, and bankruptcy cost. Use of debt can maximize the benefits of the tax shield. According to (Kraus & Litzenberger, 1973) this theory stated the benefits optimal capital mix by both tax shield benefits and cost associated with debt as financial distress and bankruptcy cost. Pecking Order Theory first contributes by (Donaldson, 1961) that managers should know about the asymmetric information of the firm than outside of the investors. It means the cost of financing enhancing with asymmetric information. Financing comes from three sources as internal funds, debt, and equity. This summarized that the company should use first internal funds and then only used external funds at last sort. Pecking order theory was modified by (Myers & Majluf, 1984) and suggested that equity is a less favorable source to increase the capital. When managers issue new equity, managers think that the firm is overvalued and managers are using the benefits of this overvaluation. Then firms prefer to use debt rather than equity. Agency Theory by (Jensen & Meckling, 1976) stated that there is a conflict of interest among shareholders and managers. They do not want to share the same interest. This may lead to the principal and agent problems. Debt financing is a way to minimize the conflicts of interest that are reducing the agency cost. At last, a high level of leverage can reduce agency cost and improve firm performance.

Debt is the most suitable source of financing when firms are unable to use their own resources for their business (Bae, Kim, & Oh, 2017). Those firms, which have high tangible assets, will be able to give collateral for debts. When a company becomes defaulter on debt, the assets will be seized and the company can be saved from bankruptcy. So the companies with high tangible assets have fewer chances to default. (Salehi, Lotfi, & Farhangdoust, 2017) the study investigates the impact of financial distress cost of ownership concentration and capital structure. They employed panel data of 786 listed firms of the Tehran Stock Exchange for the period of five years (2010-2015). They used 2SLS and findings of their study shows that ownership concentration is significant positive associated with firm capital structure. The study of (Saona et al., 2018) discussed the affiliation of firms in the context of business groups and also measures the impact of ownership concentration on capital structure decision of Chilean firms. It was found that group affiliation business enjoys the internal capital markets that minimize the demand for external debt and mostly shareholders of these affiliated business groups have control over managers. Research of (Farooq, 2015) measures the link between ownership concentration and capital structure of MENA countries. They employ Pooled regression analysis on panel data for the period of 2005-2009. Their findings show a significant negative relationship between ownership concentration and capital structure. Another study by (Santos,

Moreira, & Vieira, 2014) concluded that ownership concentration is negatively associated with financial leverage.

(Paramanantham et al., 2018) measures the relationship between ownership concentration and debt policy in the context of Malaysian firms. They used panel regression analysis based on Top 100 public listed firms of Malaysia over a period of five years (2011-2015). Findings panel regression analysis show that ownership concentration is significant negative related to financial structure. (Granado- Peiró & López- Gracia, 2017) the research investigates the relationship between corporate governance and capital structure of Spanish listed firms by using panel data over the period of 2005 to 2011. They used Panel fixed effects and system GMM and both specifications show a non-monotonic association between ownership concentration and capital structure. A study by (Céspedes, González, & Molina, 2010) concentrated on ownership concentration and the determinants of capital structure in Latin America firms. The data were gathered from seven countries. It was concluded that ownership concentration is positively influenced by leverage and growth is also positively associated with leverage. (Margaritis & Psillaki, 2010; Pindado & de La Torre, 2011) also demonstrated that ownership concentration is positively associated with leverage. Research by (Drobetz, Janzen, & Requejo, 2018) documented the efficiency of capital allocation over the shipping firms. They also investigate the impact of ownership concentration on firm's value. A sample size of 126 listed firms was analyzed for the time of 1997-2016. End results of their research explain that ownership concentration has a positive impact on the value of the firm.

Hypothesis Development

Ownership Concentration and Capital Structure

Ownership concentration is explained as the number of largest block holders. They reduce the agency problems among managers and shareholders and also control the investor's decisions on investment. These largest block holders can also effectively and efficiently monitor the management decisions making policies that give more benefits to shareholders. A study by (Paramanantham et al., 2018) argued that ownership concentration is negatively associated with capital structure. According to (Farooq, 2015; Mehran, 1992), there is a positive relationship between ownership concentration and capital structure of the firms. So, it is stated that:

H1: There is a significant positive relationship between ownership concentration and capital structure.

Profitability and Capital Structure

The profitability of the firm is measured through return on assets and also calculated by earnings before interest and tax divided by total assets (Briones & Chang, 2017). It shows that how much a firm earned by an investment of the assets and how the managers use effectively the investor's fund (Vătavu, 2015) or in other words it generates an idea about how efficient management using its assets to generate large earnings (Nawaz & Haniffa, 2017). According to the agency theory by (Jensen & Meckling, 1976), higher leverage is expected to have higher agency costs due to diverging interests between shareholders and debt holders and thereby leads to a decline in firm's performance. The assumptions of the pecking order theory by (Myers, 1984; Myers & Majluf, 1984) also predicted a negative relationship between leverage and firm profitability. Many researchers from all over the world have studied particularly on the capital structure to measure the impact of debt policy and firm performance (Abor, 2005; Muchiri, Muturi, & Ngumi, 2016; Sadeghian, Latifi, Soroush, & Aghabagher, 2012; Salim & Yadav, 2012). Some studies found a positive impact on capital structure and firm performance (Abor, 2005) and some studies found negative effects between profitability and leverage (Liaqat et al., 2017; Tsuruta, 2017; Vithessonthi & Tongurai, 2015). So, we can formulate the following hypothesis:

H2: There is a significant negative relationship between profitability and capital structure.

Tangibility and Capital Structure

Tangibility is concerned with the number of assets that are used as collaterals for getting loans. It is a ratio measured by fixed assets to total assets (Rajan & Zingales, 1995). Pecking order theory predicted a negative association, while agency theory stated a positive relationship between leverage and tangibility (Harris & Raviv, 1991). Some studies found a positive relationship between tangibility and leverage (Bevan & Danbolt, 2002; Huang, 2006; Titman & Wessels, 1988; Wald, 1999). Whereas, (Booth, Aivazian, Demirguc- Kunt, & Maksimovic, 2001; Mazur, 2007; Mukherjee & Mahakud, 2010) also found a negative relationship because larger firms have a high level of tangible assets that lead to both debt and equity financing. Therefore, firms can use a target capital structure in different projects. Thus:

H3: There is a significant negative relationship between tangibility and capital structure.

Board Size and Capital Structure

As explains by (Adams & Mehran, 2003) largest board size can control the managers and firm performance effectively. (Lipton & Lorsch, 1992) stated that the largest board size has less standing and face many conflicts and difficulties as compare to small board size. A study by (Berger & Udell, 1994) concluded that there is a significant negative relationship between board size and financing decisions. In views of (Saad, 2010) there is a significant positive association among board size and firm capital structure. While (Wiwattanakantang, 1999) find a negative but insignificant relationship between board size and capital structure. As (Ofek & Yermack, 1997) described that firms with larger board size lead to having less amount of debt because they force the management to use less amount of debt in order to avoid high-risk met by investors. Hence, the following hypothesis is used in this study.

H4: There is a significant positive relationship between board size and capital structure.

Firm Size and Capital Structure

According to (Abdullah, 2005; Briones & Chang, 2017) firm size is measured by the natural logarithm of total assets of the firm. Normally, firm size is positively related to capital structure. Because the larger firms normally prefer to a high level of debt and smaller firms afford the small level of debt (Rajput & Chawla, 2019). There are different studies that found a positive relationship between firm size and capital structure (Friend & Lang, 1988; Rajan & Zingales, 1995). So,

H5: There is a significant positive relationship between firm size and capital structure.

Methodology

The overall population consists of all chemical firms listed in Karachi Stock Exchange of Pakistan. There are 42 chemical sector firms listed at Karachi Stock Exchange of Pakistan. But the current study used the sample size of 26 firms listed in the chemical sector of KSE due to inconvenience and non-availability of the data.

Variables

Dependent Variable

In order to measure the impact of ownership concentration on capital structure, we consider the dependent variable capital structure measured by three debt ratios. STD measured as short term debt/total assets (Abor, 2007; Ahsan, Man, & Qureshi, 2016). Long term debt measured as the long term debt/total assets (Ahsan et al., 2016; Ramadan, 2013) Total debt ratio is calculated by total debt/total assets (Ahsan et al., 2016; Salim & Yadav, 2012; Vieira, 2017).

Independent Variable

The current study analyzed "Ownership Concentration" (OWCN) as an independent variable. It is calculated as a percentage of equity held by the top 5 substantial shareholders of the firm (Paramanantham et al., 2018; Xinyuan, Nan, & Yufei, 2017).

Control Variable

In addition to firm ownership concentration, the current study also used many other controlling variables like as Return on Asset (ROA) measured by EBIT/ total assets (Riaz, 2015), Tangibility (TANG) is calculated by fixed assets / total assets (Kayo & Kimura, 2011; A. Shah & Khan, 2007) and Board Size (BSIZE), as measured by log of number of board of directors (Abor, 2007; Kajananthan, 2012; Khawaja, Bhatti, Ashraf, & Henry, 2018). Firm size (FSIZE) is calculated by the natural logarithm of total assets of the firm (Abdullah, 2005; Briones & Chang, 2017).

Model Specification

In order to examine the impact of ownership concentration on firm's financial structure adjustment of chemical sector of Pakistan, we used a Panel least square regression, which is most widely used in finance-related previous studies. Following econometric models are used to measure the impact:

$$STD_{it} = \beta_0 + \beta_1 OWCN_{it} + \beta_2 ROA_{it} + \beta_3 TANG_{it} + \beta_4 BSIZE_{it} + \beta_5 FSIZE_{it} + \varepsilon_t \dots (1)$$

$$LTD_{it} = \beta_0 + \beta_1 OWCN_{it} + \beta_2 ROA_{it} + \beta_3 TANG_{it} + \beta_4 BSIZE_{it} + \beta_5 FSIZE_{it} + \varepsilon_t \dots (2)$$

$$TD_{it} = \beta_0 + \beta_1 OWCN_{it} + \beta_2 ROA_{it} + \beta_3 TANG_{it} + \beta_4 BSIZE_{it} + \beta_5 FSIZE_{it} + \varepsilon_t \dots (3)$$

Where,

STD= Short-term debt Ratio

LTD= Long-term debt Ratio

TD=Total Debt Ratio

OWCN= Ownership Concentration

ROA= Return on Asset

TANG= Tangibility

BSIZE= Board Size

FSIZE= Firm Size

i= firms

T= time

ε = Error term

β_0= constant term

Generally, there are two dimensions in panel data models; the first one is the cross-sectional dimension (N) and another is the time series dimension (T). It is expected that alone cross-sections and time-series data analysis (where N=1 & T=1 respectively) are found very simple than panel data estimators. But in some situations panel data may enable the actual computation and interference. However, all variables of this study

explain the change both in term of units and times. The panel regression model of dependent variables Y and independent variables X, with units i and time period t, examine in the following equation.

$$Yit = \alpha it + \beta it\ Xit + \varepsilon it\ldots..\ (4)$$

Where N is a unit number, T is time, εit is the error term, αit is a parameter of constant and βit is a parameter of the slope.

Results

Descriptive Statistics

Table 1: Descriptive Statistics

	Obs	**Mean**	**Std. Dev**	**Min**	**Max**
STD	156	1.675263	15.8934	0.0170762	198.8657
LTD	156	0.1014717	0.1039408	0.00	0.4236185
TD	156	1.776735	15.88518	0.1189307	198.8657
OWCN	156	0.789375	1.125324	0.000	9.014391
ROA	156	0.0881568	0.2326076	-2.295214	0.4654861
TANG	156	0.5353455	0.2332898	0.0177425	1.00
BSIZE	156	2.085101	0.2330203	1.386294	2.564949
FSIZE	156	14.38215	2.01996	7.979339	18.81828

Table 1 depicts the results of the descriptive statistics of the variables of interest used in the current study. The mean value of LTD is 10.14% that shows on average firms have less amount of LTD (Su & Li, 2013). In other words, on average firms have fewer amounts of LTD as compared to STD and LTD. The mean value of STD is 1.675 with Standard deviation value 15.893 with minimum value is 0.017 and the maximum value is 198.86. TD has mean value 1.77 with minimum and maximum value of 0.11 and 1.98 respectively. Firm profitability (ROA) is very low (Su & Li, 2013), on average ROA is 8.08%. On average the value of OWCN is 78.93%. The average value of TANG and BSIZE is 0.535 and 2.085 respectively. The mean of FSIZE 14.382.

Correlation Analysis

Table 2: Correlation Analysis

	STD	**LTD**	**TD**	**OWN**	**ROA**	**TANG**	**BSIZE**	**FSIZE**	**VIF**
STD	1.0000								
LTD	-0.0823	1.0000							
	0.3069								
TD	1.0000	-0.0758	1.0000						
	0.0000***	0.3468							
OWCN	0.0042	0.0369	0.0044	1.0000					1.04
	0.9589	0.6474	0.9565						
ROA	-0.8314	-0.0405	-0.8321	0.0940	1.0000				1.46
	0.0000***	0.6157	0.0000***	0.2429					
TANG	0.1653	0.5331	0.1689	-0.1635	-0.3706	1.0000			1.46
	0.0392**	0.0000***	0.0351**	0.0414**	0.0000***				
BSIZE	-0.0506	0.1053	-0.0499	-0.0689	0.2308	-0.0185	1.0000		1.12
	0.5308	0.1907	0.5362	0.3924	0.0037	0.8186			
FSIZE	-0.2041	0.4245	-0.2014	-0.0133	0.2833	0.2825	0.2747	1.0000	1.41
	0.0106	0.0000***	0.0117	0.8693	0.0003	0.0004	0.0005		

*** Significance level 0.01, ** Significance level 0.05, and * Significance level 0.1

Table 2 shows the correlation analysis of the variables used in this study. The correlation between capital structure and OWCN is 0.0042 that depicts that there is a positive but insignificant relationship. The correlation among capital structure and ROA is -0.8314 at significant level 1%, it means there is a significant negative correlation. The correlation value of capital structure and TANG is 0.1653 at a significant level of 5%, it shows there is a significant positive correlation. The correlation between capital structure and BSIZE is negatively but not significant with the value of -0.050. FSIZE is negatively correlated with debt structure with -0.2041. In addition to this, all the VIF values are less than 10 which depicts that there is no multicollinearity problem in data (Wooldridge, 2015).

Regression Analysis

Table: 3 (Regression Results)

VARIABLES	(Model 1) STDs	(Model 2) LTD	(Model 3) TD
OWCN	1.041*	0.0111*	1.052*
	(0.586)	(0.00604)	(0.585)
ROA	-66.65***	0.0224	-66.63***
	(3.361)	(0.0346)	(3.355)
TANG	-14.09***	0.222***	-13.87***
	(3.352)	(0.0345)	(3.346)
BSIZE	10.30***	0.0177	10.32***
	(2.944)	(0.0303)	(2.938)
FSIZE	0.710*	0.0134***	0.723*
	(0.380)	(0.00392)	(0.380)
Constant	-17.42**	-0.258***	-17.68**
	(6.975)	(0.0718)	(6.962)
Observations	156	156	156
R-squared	0.751	0.383	0.752

*Standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$*

This study tested the hypothesis by using pooled ordinary least squares (OLS) regression and the results are described in the table: 3 for all the measures of capital structure as dependent variables. For each dependent variable of capital structure, this study has used three models. The OWCN is positively associated with STD, LTD, and TD at 10% level of significance. Ownership concentration solves the agency conflict of interest among shareholders and managers. Normally, shareholders prefer debt financings over equity financings and in other words, it also depicts that larger shareholder has actively control over management due to a higher level of leverage. These results support to H1 and the results are similar to the study of (Booth et al., 2001; Margaritis & Psillaki, 2010; Pindado & de La Torre, 2011). With regards to controlling variables, ROA has a statistically significant and negative relationship with STD and TD it is demonstrated that a higher level of leverage leads to lower ROA and these findings are supported with previous studies of (De Miguel & Pindado, 2001; Frank & Goyal, 2003; Gaud, Jani, Hoesli, & Bender, 2005; Ozkan, 2001; Zeitun & Tian, 2014). These results are similar to pecking order theory that reveals that firms usually focus on internal sources of funds in the case of high profit. While in contrast to this firms use external sources of funds when they have low profit. In model 2, profitability has a positive significant relationship with LTD and this finding is similar to the study of (Simerly & Li, 2000; Weill, 2008). The result of TANG shows that it is statistically negative influenced by STD and TD. This finding is similar to the study of (Santarelli & Tran, 2018; Zeitun & Tian, 2014). Which indicates that firm with higher tangibility tends to have lower firm performance and this support to pecking order theory. Chemicals firms invest a great portion into fixed assets which do not enhance the performance. In other words, firms have not properly used for fixed assets. TANG also has a significant positive association with LTD at 5% of significant level, which supports to trade off theory and

says that tangibility can be useful in reducing the default risk of the chemical firm. BSIZE has a significant positive relationship with capital structure but it also has an insignificant impact with LTD and findings support to the study of (Abor, 2007). FSIZE is significant positive related to capital structure. So, FSIZE findings are consists of (Li & Singal, 2019) because larger firms afford the high debt and also support to trade off theory. This theory recommends that larger firms are more diversified, there will be fewer chances of bankruptcy and usually, these firms are preferred to more debt. R-square shows the degree of variation in capital structure due to all explanatory variables used in the current study. So here, R-square is high at 75% in Model 1, it is 38% in Model 2 and at Model 3 R-square is also 75%.

Conclusion

The main aim of this study is to measure the ownership structure impact on capital structure. This study used panel data for the period of 2012-2017 for Chemical firms listed at Karachi Stock Exchange of Pakistan. After employing pooled ordinary least squares (OLS) regression, the findings reveal that ownership structure has a significant positive association with capital structure. This stated that larger shareholders have a right to minimize the agency cost between managers and shareholders. They also monitor the team very effectively and efficiently due to the higher level of leverage. Profitability and Tangibility have a significant negative relationship with financial leverage. Board size also has a significant positive impact on leverage.

The limitation of this study is the use of a small sample size of only chemical firms. These results are useful to different stakeholders like as the owners of the firms, government, investors, experts of finance and the academic community. These study findings provide helpful to owners especially shareholders of the firms who have managerial control in the firm. It is also helpful to understand that how to reduce the excesses of managers because managers can employ the resources of firms to maximize the firm value instead of the benefits that are adverse for the wealth of minority owners. It would be interesting in future research to increase the size of firms and can use a different proxy of ownership structure such as institutional ownership, managerial ownership and family ownership impact on leverage.

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