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# Debt Market Trends and Predictors of Specialization: An Analysis of Pakistani Corporate Sector

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**Abstract:** Recently, debt structure research has started focusing on the strategic perspective of financing choices, particularly to understand the reasons for debt specialization (DS). This paper examines trends of specialization over time and industry by using a comprehensive dataset on types of debt employed by the public limited companies during 2009–2018. The objective of the current study is to analyze the effect of debt market conditions by identifying significant predictors of DS. Time-series and cross-sectional results confirm the existence of DS, which is further validated by the findings of the cluster analysis. The empirical results indicate that overall, 61% of the companies solely rely on a single type of debt, mostly on short-term obligations accompanied by long-term secured and other debts. Moreover, small, mature, rated, group-affiliated, and low-leverage companies incline more towards this strategy. Credit rating, debt maturity, financial and interest coverage ratios serve as the primary determinants of the debt market that are significantly associated with the measures of DS. The results contribute to the capital structure literature by specifying that financing choice has an important implication in deciding the debt structure composition of the organizations.

**Keywords:** debt structure; capital structure; debt specialization; financing choices; debt market conditions; financial instruments; short-term loans; long-term loans

## 1. Introduction

Financial decisions have become challenging due to the diversified options of financing. It has become difficult for scholars and financial managers to decide the best composition of debt structure. Prior research focused on the traditional capital structure options (Grjebine et al. 2018). Therefore, much debate in corporate finance has reflected the managers' decisions about selecting the best capital structure combination (Lewis and Tan 2016). However, one strategically important but less explored aspect of this debate is the debt structure choices that remain under the shadow in the literature (Graham et al. 2015; Rauh and Sufi 2010). The combination of multiple securities results in increasing debt complexity and conflict of interest. It creates the problem of free-rider among the claimants, and allocation of assets becomes difficult in case of bankruptcy (Antill and Grenadier 2019). That is why it diverted the attention of many researchers and practitioners towards the strategic perspective of financing decisions. Recently, scholars are increasingly interested in understanding why some businesses use a single loan (debt specialization) in

their debt structure while others use a variety of financing options (debt diversification). Debt diversification is a well-known technique for reducing the probability of default. However, debt specialization (DS) is a new idea that is still in its infancy; that is why more conceptually related predictors must be identified before it can be theoretically advanced.

The hitherto literature provided evidence for the fellowship of diversified strategies by the organizations. More specifically, the recent conversation is leading towards the concept of DS, which shows the reliance of the organizations on one kind of debt. Khan et al. (2016) believed 67% of the firms predominantly included single debt in their debt structure, and Colla et al. (2013) found 85% of organizations rely on a single loan type. Johnson (1997) admitted 73% of the firms lend from long-term debts. Barclay and Smith (1995) stated 26% of organizations adopt a single priority structure; similarly, Khan et al. (2017b) claimed 24% (93%) small, and 23% (98%) of the large firms obtain more than 60% (30%) loan from one type of debt.

Few of the prior studies confirmed the persistence of DS trends over time (Esteve and Tamarit 2018; Rauh and Sufi 2010). However, the literature overlooked the context of emerging economies, such as Pakistan. DiGiuseppe (2020) and Joeveer (2013) confirmed a borrowing diversity in financing patterns of the developed countries, while some of the researchers, including Fan et al. (2012) and Booth et al. (2001), also validated its presence within the developing countries. However, these authors believe that this incongruence may be due to cultural, social and economic factors, or maybe because of the change in the financial markets and institutional development (Beattie et al. 2006). Still, they did not examine the influence of debt market conditions in reshaping the DS decision of the organizations.

Prior studies consider the effect of debt market factors, mainly financial institution conditions, in determining the debt structure choices (Lemma and Negash 2013). De Jong et al. (2008) squabbled that when the bond market of the country is developed, then it contains the highest part of the borrowing, and if the stock market is highly developed, then the borrowing ratio will be low among the organizations. Companies also design their debt structure after considering the market conditions (Zavertiaeva and Nechaeva 2017). If market conditions are favourable, the interest rate is low; then they issue bonds; otherwise, opt for the share or hybrid securities option, which is also persistent to market timing theory. This high bonding between debt market factors and financing decisions indeed advanced our understanding of the debt structure choices.

The current study is intended to specify the debt market trends in the Pakistani corporate sector and investigate the predictors of DS. That is why it aims to address some unanswered questions: (1) does DS exist among the Pakistani organizations irrespective of their type? (2) what is the tendency of specialization among organizations over time and industry? (3) what are the predictors of DS? Data were collected from the non-financial sector of Pakistan during 2009–2018. Tobit and Probit models were used to find out the predictors of DS. The results will be useful for the Pakistani firms to understand their debt structure patterns and modify their financial strategies according to the market conditions. It will also help the financial institutions introduce new loan types with different maturity levels and covenants to facilitate the corporate sector.

The findings of the recent study have an important implication on strategic financial decisions and contribute to the new growing strands of literature in several ways. First, to the best of our knowledge, it is the first effort to directly examine the influence of debt market factors on organizational strategic decision making. It documents evidence on the role of credit rating agencies, debt market conditions, and organizational factors on debt financing decisions of the firms in Pakistan. Second, it extends the ongoing debate of why DS takes place by identifying the debt market predictors of it. At the same time, prior studies by Grosse-Rueschkamp et al. (2019) and Li et al. (2016) focused on organizational predictors only. Third, it presents the DS strategy as a cost-efficient strategy to obtain the best debt structure. It can serve as a cost minimization mechanism by diminishing the

chances of financial distress, agency conflicts, information asymmetry, and the hurdle of accessibility to the debt market.

## 2. Literature Review

### 2.1. Debt Structure Composition and Market Trends

Financial literature in recent years has started focusing on the heterogeneous nature of debt structure choices (Khan et al. 2017a; Malik and Afza 2016; Rauh and Sufi 2010) and tries to establish its link with the strategic perspective of debt structure composition (Hanssens et al. 2016; Morellec et al. 2015). Gleason et al. (2000) suggested that firms' strategy for including multiple debt instruments indicates their preferences for risk minimization strategy that ultimately leads towards improved performance. The firm's debt selection represents its strategic perspective either they will follow DS strategy or go for a diversified debt structure. This decision mainly depends on the accessibility of the debt instrument (Lemmon and Zender 2010). The covenant provision, bookkeeping records (Li et al. 2016), past performance, established reputation (Khan et al. 2016), cost or risk attached with debt (Baker and Martin 2011) can also be the factors that can force the firms to either follow DS strategy or go for the diversified debt structure.

Fungáčová et al. (2020) and Tengulov (2015) claimed that organizations could maintain their market position by including multiple debt types in their debt structure even during the unfavourable liquidity shocks and economic conditions. They can also get the advantage of loan accessibility with better investment and financing opportunities. While, companies follow the DS strategy to avoid costs regarding flotation, financial distress, information asymmetry, monitoring, and agency conflict (Mo and Lee 2018). These costs may affect the company's debt structure choices and often push them to include one type of debt in its capital structure. DS decision is based on cost-benefit analysis. Sometimes, companies may also prefer DS policy due to restricted access to the financial market, which forces them to rely on a single loan type.

The preference of debt instrument also depends on the availability, market timing, covenant requirements, cost, and benefits attached with each debt instrument (Giannetti 2019). If companies wanted to present themselves for monitoring, they would value bank loans over public debts (Kale and Meneghetti 2011). At the same time, firms prioritize private debts over the issuance of public securities in the presence of high information asymmetry, agency conflicts among various stakeholders, and a greater probability of default risk (Arenas 2011). However, to avoid the monitoring cost in the presence of lower information asymmetry among various stakeholders, firms sometimes go after public issues (including preferred share issuance and hybrid securities) rather than private debts (Diamond 1991).

### 2.2. Predictors of Debt Specialization

#### 2.2.1. Organizational Factors

Organizational factors are directly linked with their contextual characteristics and influencing their financing choices. These factors can be the main determinants of DS because the firm optimal debt structure largely depends on its variation. Colla et al. (2013) are among the first to recognize cash flow volatility, growth opportunities, cash holdings, research and development expenses, advertising expenses, strong board, unique product, size, maturity, credit rating, profitability, tangibility, and leverage are the main antecedents of DS. Size and age are considered essential factors in determining the debt composition (Povoa and Nakamura 2014). Larger and mature companies generally employed diversified types of loans, whereas small and new firms rely on few debt choices (Khan et al. 2017b). The capital structure theories also provided support for these factors.

Asset tangibility measures the collateral level that organizations have when they pursue for debt financing. It is concerned with fixed and tangible assets, so there is a consensus in the literature for its measurement (Rajan and Zingales 1995). It is used as a measure of collateral that the firm offers to its debt holders. It increases the trust level of

financial institutions that in return increases their loan accessibility (Baker and Wurgler 2002). Companies have to bear high borrowing costs or utilize the option of equity if they maintain low asset tangibility (Rajan and Zingales 1995). Previous studies generally report a positive relationship between asset tangibility and financing choices. However, few studies, specifically from the emerging economies, document a negative relationship between assets tangibility and financial leverage (Booth et al. 2001).

The agency cost and tradeoff theory supported the positive relationship between asset tangibility and leverage decisions. The stakeholders closely observed the leverage decisions of the companies. If the company added new debt to its capital structure, it increases the agency conflict between shareholders and debt holders and between different debt holders (Jensen and Meckling 1976). However, if the company maintains a high tangibility ratio, then this can be resolve. High asset tangibility also reduces the chances of bankruptcy, which the tradeoff theory (Baker and Martin 2011).

Information and monitoring cost is also associated with the tangibility of assets. Companies with many tangible assets reduce information asymmetry and make equity issuance less costly (Harris and Raviv 1991). Monitoring cost is also high for the companies with less collateralized assets, so they are inevitably choosing higher debt levels to limit their consumption. These arguments favour the inverse relationship and also supported by the pecking order theory. Business groups are independent business entities, share common ownership and administrative control (Bamiatzi et al. 2014). They may include listed companies, unlisted companies and private companies. Chakraborty (2013) stated that group-affiliated companies maintain low leverage ratios than stand-alone companies due to their greater accessibility to the debt market. This argument is supported by the financing pattern of pecking order theory (Myers and Majluf 1984).

Volatility measures the risk implies the uncertainty in profit and danger of losses during the business operations. Growth is the ability of an organization to generate significant positive cash flows or earnings than the overall industry and economy. Barclay and Smith (1995) suggested that stock market prices are considered to be the most appropriate reflection for the growth opportunities of any organization. The empirical evidence shows that growing companies with high earnings volatility adopt DS (Khan et al. 2017a). The capital structure theories also support this notion.

Leverage indicated the degree to which a firm is financed with borrowed money (Priester and Wang 2010). It is used to predict the debt structure patterns. Previously, scholars believed that the same leverage ratio indicates similar debt levels in the debt structure. But later, Johnson 1997; Rauh and Sufi 2010 proved that firms could maintain different debt composition even at the same level of debts. Some firms include few or even a single type of debt, while others prefer multiple debt sources. However, DS is positively related to the lower leverage ratios (Tengulov 2015). In contrast, Povia and Nakamura (2014) state that leverage ratio cannot explain variation in the debt structure. Companies with more leverage prefer public debts on bank loans (Denis and Mihov 2003). A similar relation is reported in public and private debt (Krishnaswami et al. 1999).

### 2.2.2. Debt Market Factors

Debt market factors may also influence the selection of financing choices and are considered the main determinants of DS (Denis and Mihov 2003; Kaya 2011). The primary predictor of the debt structure composition is the credit rating which significantly explains the firm's accessibility to the financial market instruments (Chemmanur and Fulghieri 1994). The debt structure changes as the credit rating of the firm changes. Graham and Harvey (2001) had found that credit rating is the second-highest concern for financial managers when determining their capital structure. They supported their argument by stating that almost 57.1% of the managers believed credit ratings are essential or very important in choosing the appropriate debt for their companies. Huang and Shen (2015) had supported these empirical findings by adding that companies quickly adjust their



capital structure when ratings are downgraded. However, their speed of adjustment is slow when ratings are upgraded.

The capital structure theories (tradeoff, agency cost, asymmetric information) support this idea (Baker and Martin 2011). The likelihood of bankruptcy is reduced by rating. According to Rauh and Sufi (2010), low-rated companies use multiple types of loan, while high-rated companies primarily rely on senior unsecured debt or equity. It also supported the pecking order theory. The rated firms are generally larger, profitable and mature. Therefore, they are in a better position to decide their debt structure by keeping in view the cost associate with each type of debt. That is why they often prefer first to utilize their retained earnings and then go for external borrowing. In the case of debt financing, they prefer those types of loan that may be cost-effective for them in the long run. These sustainable effects of credit rating explain its better bargaining position in financial decision-making.

Empirical studies revealed that companies with different credit ratings employ different types of debt. Denis and Mihov (2003) divided unrated companies into medium- and lowest-credit-rated firms. Their findings stated that medium credit-rated companies prefer private debts, while lowest-rated companies borrow from banks. Middle-ranked companies borrow from the bank, while high and low-rated companies tend to favour public debts. Sometimes high-rated companies use private placements debts rather than public debts and bank loans. Low-rated companies prefer public debt when the cost of monitoring offsets the benefits of bank loans (Diamond 1991; Rajan 1992). Unrated companies tend to issue either private debts or syndicated bank loans and sometimes incline towards public debts (Kaya 2011). Carey et al. (1998) speculated that low credit quality firms are the weakest candidate for bank loans because of the regulating policies of the bank. They can be candidates for non-bank private debts and public loans with limited access (Arena 2011).

Debt maturity is the time required to mature the debt when the par value is repaid to the debt holders. It may be the proportion of debt, maturing in more than one year (Shah and Khan 2009) or sometimes maturing in more than three or five years (Denis and Mihov 2003). It can be an important antecedent of DS because the selection of debt depends on it. But there is still no empirical study that directly addresses the impact of debt maturity on DS decisions of the organizations. The financial managers still have to decide which debt maturity (shorter or longer) they should consider positioning their debt structure successfully. Dang (2011) has found a positive relation between debt maturity and leverage. This relationship is supported by asymmetric information theory, which mainly depends on inside organizational information about default probabilities. In the case of positive news, organizations prefer short-term loans; otherwise, they prefer long-term debts (Goyal and Wang 2013).

Sometimes, short-term maturity structure is taken as positive information for credit rating, which helps firms borrow from diversified sources. Agency cost theory props up the negative relationship between debt types and their maturity structure. The effective management of debt maturity structure can sort out these agency conflicts (Myers 1977). However, Scherr and Hulburt (2001) found mixed support for information asymmetry and taxability hypothesis in small organizations compared to large organizations. They also revealed that small organizations prefer long maturing debts like large organizations in the case of debt financing. The theoretical and empirical evidence shows mixed and opposing opinions that there is yet no consensus in the finance literature about the relationship between leverage and debt maturity. This is why it has become an empirical question to investigate.

Tax rate and interest payment are the critical elements in the formation of corporate financial strategy. Corporate financial strategy largely depends on the tax rate and interest payment. Usually, companies have to pay a marginal tax rate, but it depends as some time tax rate is fixed. A tax rate can be defined as a percentage a firm owes to the state (Shah and Khan 2009; Stephenson 2018). Debt is often favoured by high corporate tax rates, while high personal tax rates favour equity. The tradeoff between tax benefits (tax

shield) and the cost of financial distress could result in an optimal debt structure. (Kraus and Litzenger 1973). Organizations with high tax rates prefer to include more debts in their capital structure because interest payments can be deducted from profits, resulting in greater interest tax advantages (Joeveer 2013). Therefore, companies increase their level of financial leverage under this condition to take the benefit of the tax shield.

The interest coverage ratio determines the firm's ability to pay its debt obligation (Albring et al. 2011; Geraschenko 2018). The high interest coverage ratio depicts that the company is in a better position to pay off its interest obligations, while a low ratio indicates high default risk. It is expected that a lower interest coverage ratio and lower tax rates can be positively related to DS (Khan et al. 2021). All these theoretical, empirical, and logical justifications serve as the foundation for the current study and justify the importance of using the study variables as predictors of DS. We may address the proposed research questions based on these foundations and significantly advance the current understanding of the scholars and practitioners about the phenomenon under study.

### 3. Methodology

#### 3.1. Data Collection and Measurement

For this study, data for 419 publicly traded non-financial firms were mainly extracted from annual audited reports of the Pakistani companies and balance sheet analysis reports of the state bank of Pakistan from 2009–2018. Additionally, information about credit rating was taken from JCR-VIS (Japan credit rating-vital information services) reports and the Pakistan credit rating (PCR) agency. At the same time, the online database of business recorders was utilized to collect the data for the stock market prices. After arranging the data, we also apply sample selection rules and remove (1) missing data, (2) zero values for total assets and debts, (3) leverage ratios outside the unit interval. Finally, we eliminate outliers using the stem and leave method, and we end up with 3985 company-year observations. Table 1 presents information about study variables, their descriptions, and measurement.

**Table 1.** Mnemonics, definitions, and sources of variables.

Variables	Descriptions	Sources
Debt Specialization		
HHI	HHI refers to the degree of DS that is used to evaluate the degree of DS; where 1 = inclusion of only one debt type, while 0 = include multiple debt types	Colla et al. (2013)
Excl75	A dummy variable where "1" for the organizations obtaining 75% or more debts from one debt type and "0" otherwise.	Khan et al. (2016)
Organizational Factors		
Size	Log of total assets	Almeida et al. (2015)
Age	Time in years since the firms listed at the stock exchange and issued their first IPO	Khan et al. (2017a)
AT	(Tangible fixed assets + inventory)/total assets	Hanssens et al. (2016)
Grow	The market value of equity/book value of equity	Povoa and Nakamura (2014)
BGA	A dummy variable where "1" stands for group affiliated firm, or "0" otherwise	Chittoor et al. (2015)
EV	The standard deviation of EBIT/average assets	Danis et al. (2014))
Lev	Long-term loans/book value of total assets	Albring et al. (2011)
Debt Market Factors		
Rating	A dummy variable where "1" = rated firm "0" otherwise	Samreen et al. (2013)
DM	Debt maturing in more than one year/total debts	Shah and Khan (2009)
TR	Annual tax/EBIT	Shah and Khan (2009)
FR	Financial expenses/net sales	Meneghetti (2012)
ICR	EBIT/interest	Khan et al. (2021)

### 3.2. Estimation Methods for Unbalanced Panel Data

The current study applied a panel data methodology by including 419 publicly listed non-financial firms of Pakistan from 2009–2018. It adopted a Tobit regression model, which is widely used in the corporate finance literature and recommended by scholars when the dependent variable is fractional by nature (Alderson et al. 2014; Buchuk et al. 2014; Custódio et al. 2013). This model is useful in providing a better understanding of the statistical inference on the estimated parameters and hence, helps to advance the corporate finance literature significantly. That is why we prefer the Tobit regression model over the other estimated models. Our dependent variable, “DS,” is determined using the HHI measure, which is also fractional by nature and has values bounded between zero and one, both inclusive. Tobit regression models generally rely on linearity, normality, and homoscedasticity assumptions. A normal distribution of the data is indicated by the absolute value of skewness and kurtosis (i.e., between |2|) (George 2010). Since homoscedasticity is related to the normality assumption (Maddala 1986), therefore, if the normality assumption is met, then the relationship between variables is also considered as homoscedastic (Tabachnick and Fidell 2013). Table 2 shows the skewness and kurtosis effects for all study variables. The Tobit regression model for DS based on the HHI measure is introduced in Equation (1).

$$HHI_t = \alpha_t + \beta_1 Size_t + \beta_2 Age_t + \beta_3 AT_t + \beta_4 Grow_t + \beta_5 BGA_t + \beta_6 EV_t + \beta_7 CR_t + \beta_8 DM_t + \beta_9 TR_t + \beta_{10} FR_t + \beta_{11} ICR_t + \varepsilon_t \quad (1)$$

This study also uses a discrete dependent variable, *Excl75*, to measure the DS that is binary by nature, representing “1” for high DS and “0” otherwise. More specifically, “1” indicates that companies are taking 75% or more debts from one type of debt. The ordinary least square model is often used in finance and economic studies for the binary dependent variables (Wooldridge 2012) because it is relatively easy for scholars to infer the results. However, the problem with the ordinary least square model is: First, its predicted probabilities (i.e., fitted values) can be outside the range of zero and one; second, the relationship between variables may not be linear and; third, its residuals plot quickly reveal heteroscedasticity. These problems can better be dealt with more advanced nonlinear binary response models (i.e., Logit and Probit) estimated by using maximum-likelihood Estimation.

The binary response models, including logit and probit models, can be expressed as:

$$P(y = 1/X) = f(\beta_0 + X\beta) \quad (2)$$

Where  $f$  is a function bounded between zero and one.  $X\beta$  refers to

$$\sum_{k=1}^n \beta_k X_k \quad (3)$$

Equation (2) explained the probit model for DS based on the measure of *Excl75*

$$Excl75 = \alpha_t + \beta_1 Size_t + \beta_2 Age_t + \beta_3 AT_t + \beta_4 Grow_t + \beta_5 BGA_t + \beta_6 EV_t + \beta_7 CR_t + \beta_8 DM_t + \beta_9 TR_t + \beta_{10} FR_t + \beta_{11} ICR_t + \varepsilon_t \quad (4)$$

## 4. Results

The descriptive statistics are presented in Table 2. Columns 1 and 2 comprise the mean (median) values of all the study variables. It is observed that the leverage ratio is 0.685 (0.742), which is greater than the leverage ratios reported in the prior studies by Grosse-Rueschkamp et al. (2019), and Rauh and Sufi (2010). The sample mean (median) values for size indicate that most of our sample comprises mature companies, with an

average age of almost 31 years. The sample companies contain nearly 70% tangible assets and have higher growth opportunities.

**Table 2.** Descriptive statistics.

Variables	Mean	Median	SD	Correlation		Skewness	Kurtosis
				HHI	Excl75		
Organizational Factors							
Size	3.121	3.218	1.024	−0.218 ***	−0.168 **	−0.958	1.257
Age	1.310	1.352	0.854	−0.003 **	−0.005 **	−1.454	1.279
AT	0.701	0.747	0.745	−0.245 ***	−0.218 ***	−1.754	0.754
Grow	2.518	2.339	2.285	0.042 **	−0.021 *	1.273	1.317
BGA	0.541	1.000	0.453	−0.014 ***	−0.019 ***	−0.758	−1.753
EV	0.128	0.145	0.185	0.041 **	0.051 ***	2.129	1.650
Lev	0.685	0.742	0.273	−0.115 ***	−0.120 **	−0.795	−0.294
Debt Market							
Rating	0.147	0.000	0.430	−0.016 ***	−0.012 ***	2.751	1.543
DM	0.217	0.281	0.249	−0.417 ***	−0.420 ***	0.835	2.276
TR	0.241	0.159	1.425	−0.012 ***	−0.022 *	1.271	1.456
FR	0.331	0.188	1.792	−0.010 ***	−0.012 ***	2.816	1.780
ICR	0.031	0.029	0.183	−0.011 ***	−0.014 **	1.270	0.642

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

The findings further elaborate that approximately 54% of the sample companies are group affiliated, while 15% are rated. The selected companies obtain debts with an average maturity of 2 years and a financial ratio of 33%. The values of skewness and kurtosis show that there no abnormality in the data. Overall, the standard deviation values show reliable results. The correlation analysis explains the characteristics of those organizations, which adopt the DS strategy. The correlation results of Table 2 also show that riskier and growing companies are more involved in DS. Whereas large, mature, group-affiliated, credit-rated companies contain a high leverage ratio, many tangible assets with less debt maturity and low financial ratios use a diversified debt structure. These findings are consistent for both the measures of DS (HHI, Excl75).

Table 3 explains the descriptive statistics, including mean, median, standard deviation and percentiles for all debt types. The results ascertain that the usage of short-term debts dominant in the debt structure of Pakistani firms. All most all the organizations must include other short-term loans (92.87%), while for the second option, they go for short-term secured debts (74.15%). The mean (median) values of other short-term debts also validate the above notion 0.330 (0.402). In the case of long-term debts, companies rely on other long-term debts (71%), while the usage of debentures remains the least significant (approximately 5%).

**Table 3.** Debt types summary.

Types of Debts	Mean	Percentile							SD	Obs. with Positive Usage (%)
		10th	25th	50th	75th	90th	95th	99th		
SSD	0.306	0.000	0.018	0.282	0.479	0.592	0.713	0.815	0.354	75.39
OSD	0.330	0.135	0.265	0.482	0.652	0.915	0.992	1.000	0.327	92.87
LSD	0.142	0.000	0.000	0.129	0.195	0.398	0.519	0.742	0.217	57.86
LUND	0.079	0.000	0.000	0.081	0.137	0.323	0.410	0.898	0.205	39.12
DEB	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.292	0.103	5.21
OLD	0.137	0.000	0.000	0.102	0.140	0.272	0.368	0.637	0.175	71.09

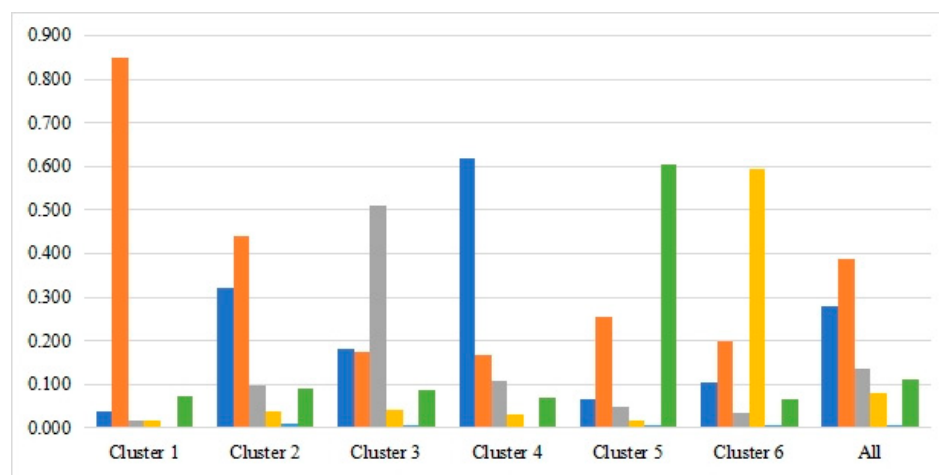
The evidence for the existence of the DS strategy confirms through the cluster analysis. This technique recognizes the groups having the same characteristics within the group



but different from other groups. We use Stata software for identifying clusters having similar features within the cluster and finally end up with 6 clusters. The results in Table 4 indicate that overall, 61% of Pakistani firms rely on DS strategy; however, their tendency of specialization matters. The bold values in Table 4 indicate the existence of DS within each cluster. A total of 2938 firms are included in the cluster, of which 85% of them specialize in other short-term debts (See Table 4, cluster 1 for the reference). These firms are medium in size, mature, having many tangible assets, high growth opportunities, leverage ratios and less risky. In contrast, long-term other debts are the second important source of financing for them. These findings are also shown in Figure 1, where each colour represents a unique type of debt.

**Table 4.** Debt specialization cluster analysis.

Cluster	Types of Debt						HHI	Characteristics of Organization						Observations.
	SSD	OSD	LSD	LUND	DEB	OLD		Size	Age	Lev	Grow	AT	EV	
1	0.040 [0.000]	<b>0.849</b> [0.870]	0.017 [0.000]	0.019 [0.000]	0.001 [0.000]	0.073 [0.015]	0.713 [0.713]	2.927 [3.112]	1.281 [1.362]	0.507 [0.524]	5.483 [0.046]	0.507 [0.524]	0.139 [0.084]	538
2	0.323 [0.332]	<b>0.440</b> [0.443]	0.096 [0.066]	0.040 [0.000]	0.012 [0.000]	0.089 [0.067]	0.329 [0.245]	3.359 [3.387]	1.281 [1.342]	0.672 [0.713]	0.161 [0.094]	0.672 [0.713]	0.088 [0.067]	507
3	0.180 [0.171]	0.175 [0.159]	<b>0.509</b> [0.479]	0.040 [0.000]	0.008 [0.000]	0.088 [0.050]	0.289 [0.244]	3.455 [3.567]	1.197 [1.342]	0.713 [0.794]	5.776 [0.134]	0.713 [0.794]	0.075 [0.065]	365
4	<b>0.618</b> [0.597]	0.169 [0.176]	0.108 [0.084]	0.032 [0.000]	0.005 [0.000]	0.069 [0.040]	0.377 [0.337]	3.443 [3.520]	1.310 [1.342]	0.741 [0.802]	0.704 [0.098]	0.741 [0.802]	0.110 [0.063]	632
5	0.067 [0.000]	0.255 [0.252]	0.049 [0.000]	0.019 [0.000]	0.005 [0.000]	<b>0.606</b> [0.544]	0.444 [0.405]	3.378 [3.371]	1.292 [1.362]	0.499 [0.460]	1.845 [0.119]	0.499 [0.460]	0.102 [0.070]	163
6	0.104 [0.032]	0.198 [0.184]	0.035 [0.000]	<b>0.594</b> [0.547]	0.007 [0.000]	0.065 [0.021]	0.417 [0.348]	2.284 [2.634]	1.319 [1.342]	0.720 [0.832]	0.115 [0.052]	0.720 [0.832]	0.092 [0.070]	205
All	0.280 [0.244]	0.387 [0.300]	0.136 [0.040]	0.079 [0.000]	0.006 [0.000]	0.113 [0.050]	0.437 [0.353]	3.209 [3.379]	1.280 [1.342]	0.652 [0.721]	2.453 [0.090]	0.652 [0.721]	0.104 [0.069]	2411



**Figure 1.** The distribution of debt types within a cluster.

In clusters 3–6, the medium degree of DS occurs, which is also depicted in Figure 1. In cluster 3, firms specialize in long-term secured debts (51%), in cluster 4, includes short-term secured debts (62%), in cluster 5, 61% of companies rely on long-term other debts, whereas in cluster 6, (60%) companies include long-term unsecured debts. In cluster 2, a low degree of DS takes place. One thousand eight hundred seventy-four companies exist, and among them, 44% of companies rely on other short-term debts with mean (median) values as 0.440 (0.443). These companies are mature, low growth, less risky, larger in size, having high tangibility and leverage ratios. In cluster 2, the other dominant financing source is short-term secured debt having mean (median) values of 0.323 (0.332).

Overall, the outcomes of cluster analysis endorse the existence of DS and claim that primarily 61% of Pakistani firms include the one type of debt in their debt structure opposes

Khan et al. (2016) and Colla et al. (2013), who claimed 67% of Pakistani firms and 85% of the firms in the US depend on a single type of debt, respectively. However, this study states that the tendency of specialization varies across organizations. Some organizations show more inclination towards specialization; some are evident of moderate, while others are the verdict of a low degree of specialization.

Table 5 shows the trends (time-series) analysis of how debt instruments are used uniquely during the sample period. The outcomes show that up to 2018, the dependence of companies over secured long-term debt is high compared to other types of long-term debts. Later, the reliance on non-secure long-term debt increases as compared to secured long-term debt. The study observes that organizational dependency on the unsecured long-term and other long-term debts has been increased over time. In contrast, dependence on debentures and short-term debts is stable. HHI value is increasing over the years, i.e., approximately from 40% to 56% during 2009–2018.

**Table 5.** Debt types and debt specialization over time.

Year	SSD	OSD	LSD	LUND	DEB	OLD	HHI
2009	0.260	0.402	0.149	0.080	0.009	0.089	0.396
2010	0.265	0.410	0.138	0.085	0.008	0.084	0.397
2011	0.282	0.428	0.118	0.083	0.006	0.083	0.415
2012	0.268	0.435	0.120	0.083	0.006	0.088	0.398
2013	0.304	0.396	0.121	0.074	0.005	0.101	0.497
2014	0.345	0.202	0.167	0.067	0.006	0.213	0.520
2015	0.362	0.225	0.165	0.074	0.005	0.169	0.529
2016	0.356	0.205	0.152	0.086	0.005	0.196	0.525
2017	0.355	0.217	0.150	0.081	0.006	0.192	0.531
2018	0.364	0.192	0.141	0.072	0.006	0.226	0.564

Table 6 elaborates specialization tendency across the industry and demonstrates the usage of various kinds of debts from 2009 to 2018. With the exception of textile, chemicals, chemical products and pharmaceuticals, cement, and fuel and energy, more than 71% of the industry depends on other long-term debts compared to secured long-term debts. However, secured long-term debts remain the vital source of financing for firms compared to other unsecured debt, including debentures. The usage of traditional bridge financing and other debts remain steady across firms in this study's sample period. The dominance of short-term debt persists and remains across all industries.

**Table 6.** Debt types and debt specialization over industry.

Industry	SSD	OSD	LSD	LUND	DEB	OLD	HHI
Textile	0.378	0.293	0.182	0.137	0.001	0.009	0.380
Sugar	0.291	0.307	0.131	0.091	0.004	0.176	0.314
Food product	0.326	0.421	0.092	0.049	0.000	0.112	0.561
Chemicals, chemical products and pharmaceuticals	0.431	0.248	0.121	0.051	0.011	0.138	0.449
Manufacturing companies	0.454	0.303	0.076	0.037	0.012	0.118	0.518
Cement	0.279	0.172	0.285	0.101	0.021	0.142	0.262
Mineral products	0.252	0.302	0.163	0.099	0.000	0.184	0.335
Motor Vehicles, Trailers and auto parts	0.426	0.387	0.029	0.021	0.002	0.135	0.571
Fuel and energy	0.207	0.283	0.282	0.098	0.006	0.124	0.821
Information, communication and transport	0.395	0.245	0.119	0.101	0.011	0.129	0.376
Coke and refined petroleum products	0.412	0.304	0.129	0.008	0.002	0.145	0.734
Paper, paperboard and products	0.106	0.405	0.175	0.125	0.000	0.189	0.476
Electrical Machinery and apparatus	0.231	0.494	0.076	0.095	0.007	0.097	0.455
Others	0.098	0.461	0.125	0.092	0.008	0.216	0.519

HHI value elaborates the DS trends across all industries. HHI high value shows the presence of a higher degree of DS across the firms. The fuel and energy sector shows the highest HHI value of about 82%, followed by coal and refined petroleum products firms stood second with about 73% HHI value. HHI value is higher than 50% in sample industries (food products), manufacturing firms, Auto firms (motor vehicles), trailers and auto parts, and other industries. From the remaining eight industries, HHI value is more than 40% in three different sectors. These results affirm that the DS strategy is being followed in Pakistani firms.

In short, we see commonly six types of debts are used in the Pakistani public limited companies, but short-term debts are more vital and ranked higher among other types of debts. On the other hand, secured long-term debts have more vitality and common than long-term unsecured debts. Our analysis results of cross-sectional and time-series support our argument.

Multivariate regression analysis is used to provide evidence in favour of essential predictors of DS. Due to the fractional nature of HHI, Tobit regression models (1–3) are applied, shown in Table 7, while for Excl75, which is a categorical variable and binary in nature, Probit regression models (4–6) are employed. Size, age, asset tangibility and business group affiliation present negative while earning volatility reported a positive relationship with HHI and Excl75, which remains consistent in all six models. To measure the asymmetric information, size is used because this indicates the firm's ability of debt re-payment on the principle of going concerned. The size of the firm is positively correlated with the goodwill of the firm and reduces information asymmetry.

**Table 7.** Multivariate evidence on debt specialization.

Variables	HHI (1)	HHI (2)	HHI (3)	Excl75 (4)	Excl75 (5)	Excl75 (6)
Size	−0.135 *** [0.004]		−0.161 *** [0.003]	−0.319 *** [0.028]		−0.357 *** [0.024]
Age	−0.018 * [0.010]		−0.068 ** [0.009]	−0.053 ** [0.105]		−0.139 * [0.124]
AT	−0.439 *** [0.018]		−0.340 *** [0.017]	−1.374 *** [0.120]		−0.975 *** [0.142]
Grow	0.0002 ** [0.000]		0.002 *** [0.000]	−0.001 [0.001]		−0.001 [0.001]
BGA	−0.035 *** [0.011]		−0.041 ** [0.006]	−0.236 *** [0.068]		−0.249 *** [0.072]
EV	0.146 *** [0.0361]		0.281 ** [0.027]	0.867 *** [0.212]		0.512 ** [0.107]
Lev	−0.651 *** [0.019]		−0.549 *** [0.015]	−0.921 *** [0.271]		−0.754 *** [0.112]
Rating		−0.119 *** [0.041]	−0.137 ** [0.021]		−0.367 *** [0.085]	−0.275 *** [0.072]
DM		−1.251 *** [0.045]	−0.271 *** [0.012]		−1.518 *** [0.081]	−1.435 *** [0.105]
TR		−0.001 * [0.003]	0.002 ** [0.001]		−0.012 * [0.009]	−0.011 * [0.009]
FR		−0.003 *** [0.003]	−0.008 *** [0.005]		−0.007 *** [0.019]	−0.021 *** [0.059]
ICR		−1.624 *** [0.728]	−0.412 ** [0.271]		−2.314 *** [0.591]	−2.438 *** [1.217]
Constant	1.015 *** [0.021]	0.179 *** [0.082]	1.127 *** [0.051]	1.449 *** [0.306]	−0.126 *** [0.048]	1.982 *** [0.310]
Pseudo R <sup>2</sup>	0.997	0.592	0.887	0.185	0.087	0.179
Model	Tobit	Tobit	Tobit	Probit	Probit	Probit

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

In models 1 and 4, organizational characteristics are included, which show that DS strategy is more vital for relatively mature and big firms, and their inclination is more to it. These findings are persistent to the results of [Khan et al. \(2016\)](#), who believe that the higher cost of monitoring and information collection discourage companies from thinking of switching from one type of financing to another. The asset tangibility and DS negative relationship indicate the higher bankruptcy cost. Simultaneously, the negative association with business group affiliation is evident that group affiliated company increases the accessibility of the organization towards external debts. In models 2 and 5, we added leverage and found firms with higher leverage ratios use multiple debt sources for financing. In models 2 and 6, debt market determinants are added that show credit-rated companies with more significant debt maturities and high financial and interest coverage ratios adopt the DS strategy.

## 5. Discussion

In the quest to extend the ongoing debate on why firms adopt DS strategy, we brought in new evidence to add to the critical mass. There are three main findings of the current study. Firstly, the existence of DS strategy across firms is confirmed empirically using cluster analysis. The results confirm the reliance on one type of debt in about 61% of the companies predominantly. In comparison, [Colla et al. \(2013\)](#) found the presence of DS among 85% of the organizations. The short-term debts again dominate over time and industry, followed by secured long term and other long-term debts. [Li et al. \(2016\)](#) study state that short-term debts are higher than long-term obligations, which may be possible due to restrictive covenants imposed by the creditors. In Pakistan, the debenture market is in developing stages, and due to this potential limitation, only about 5% of total borrowing from companies consists of debentures.

Secondly, the results in [Table 3](#) unveil that about three-fourth of the Pakistani firms must include short term debts in their debt structure. These debts constitute a relatively high proportion of total debts and remain the primary source of financing for the managers. One possible reason would be due to the underdeveloped market for long-term debts in the emerging economies like Pakistan or may be due to the lower cost of short-term debts ([Alipour et al. 2015](#)). [Fan et al. \(2012\)](#) claim that if the companies existed in corrupt countries where weak legal system is prevailing, they prefer short-term debts over long-term debts. By looking at long-term debts, approximately 75% of the firms use unsecured or other long-term debt for their financing needs. However, the importance of short-term debt remains intact, but long-term debt is a popular financing source.

[Brunnermeier \(2009\)](#) believes that one of the primary reasons for building up financial fragility is the reliance on short-term loans. Firms face difficulty coping up with the financial crisis, particularly during the period of financial distress, and ultimately go bankrupt. Third, the findings of the study indicate that small, new, and growing companies are more inclined towards DS strategy. Whereas mature, group-affiliated, credit-rated companies contain a high leverage ratio, asset tangibility with less debt maturity, use diversified debt structures.

The current study may present wider theoretical and practical implications. First, it helps to understand the impact of existing borrowing trends of the debt market on the financing choices of the organizations. Second, as the Pakistani corporate sector managers have complete sway over the financing decisions, this study induces them to rethink the strategic perspective of the debt structure choices by keeping in mind the cost and benefits appended with each debt type. Third, time-series and industrial trend analysis specify the continuous dependence of Pakistani firms on the short-term debts that suggest the development and facilitation of the long-term debt market. The financial institutions must expand and advance the capital and debt market and provide alternative and cheap financing sources to the firms.

## 6. Conclusions

This study significantly addresses an essential issue of debt structure composition. It considers it vital to understand how DS plays its role in forming and designing a financial strategy for the firms. Collectively, there are four major outcomes of this study: (1) The cluster analysis confirms the presence of DS strategy across the industry. About 61% of the companies borrow at least one kind of debt, and this confirmation comes from our cross-sectional and time series analysis. (2) From debt ranking, the short-term debt is the most preferred and dominant, then secured long-term and lastly, other unsecured long-term debts. (3) A large, mature, rated, group affiliated, and low-leveraged company is inclined to DS strategy. Whereas large, mature, group affiliated, credit-rated companies contain a high leverage ratio, many tangible assets with less debt maturity, and low financial ratios use diversified debt structures. (4) Credit rating, debt maturity, financial and interest coverage ratios serve as the main determinants of the debt market, which are significantly associated with the measures of DS. The potential explanation for employing DS strategy is to: economize default risk, monitoring costs, operational risk, flotation costs and limited ingress to the debt market.

### *Limitations and Research Directions*

Cognizant of the remarkable contribution, the present study also experiences certain limitations that are necessary to be addressed to enhance the scope of the study. First, although we employ the data of all the listed non-financial companies of PSX from 2009 to 2018, we still consider our data based on a relatively shorter time series. We could not include preceding data as reporting of debt types for companies was not mandatory before 2009, so this was out of questions to fetch DS data for all 419 firms. We are looking forward to future researchers to include more comprehensive time-series data and examine the trends of specialization over time and industry. Second, this study is the verdict of the existence of DS, but the tendency of specialization varies across the organization. It opens a new avenue for researchers to categorically divide the tendency of specialization and explore the existence of specialization across each category.

Third, the data for the current study is mainly extracted from the balance sheet analysis report of joint-stock companies by the State Bank of Pakistan, which has divided debts into six broader categories. At the same time, researchers like [Hanssens et al. \(2016\)](#), [Lou and Otto \(2015\)](#) and [Tengulov \(2015\)](#) employed particular types of debt. Therefore, it is recommended that future researchers segregate debts into more specific types to analyze the impact of identified factors and provide some new insight into the DS strategy. Fourth, although this study explains the effect of debt market predictors on the DS decision of the organization, there may be more related to organizational and non-organizational predictors that can influence corporate financial strategic choices. Future researchers must explore these predictors to explain why DS takes place?

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## Abbreviations

DS	Debt specialization
EV	Earnings volatility
EBIT	Earnings before interest and tax
HHI	Herfindahl–Hirschman index
Lev	Leverage
SSD	Short-term secured debts
Size	Size
Rating	Credit rating
OSD	Short-term other debts
Age	Age
DM	Debt maturity
LSD	Long-term secured debts
AT	Asset tangibility
TR	Tax ratio
LUND	Long-term unsecured debts
Grow	Growth
FR	Financial ratio
DEB	Debenture
BGA	Business group affiliation
ICR	Interest coverage ratio
OLD	Other long-term debts

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