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Debt Specialization within Profitability Sub-Groups: A New Perspective of Debt Structure Choices

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This paper empirically investigates how the degree of debt specialization varies because of profitability levels, affecting the organizational determinants and debt structure choices. Using a novel data of 419 firms from 2009 to 2015, we find a significant difference in the usage of debt types between the profitability sub-groups. Low profitable businesses incline more towards debt specialization than high profitable firms. However, short-term debts remain a prevalent source of borrowing regardless of profitability level for Pakistani companies. Our evidence also suggests that among the low profitability subsample, larger, riskier, growing companies with high expense ratios are more likely to be involved in the higher degrees of debt specialization, as compared to highly profitable businesses. Consistently, the preeminent reasons for debt specialization are information asymmetry, expected default risk, good reputation and accessibility to the debt market.

Keywords: debt specialization, profitability, organizational determinants, debt structure choices

There has been a sustained scholarly interest in understanding the heterogeneous nature of debt structure choices (Rauh & Sufi, 2010; Valta, 2016) especially, to relate them with strategic decisions (Khan, Qadeer, John, & Sheeraz, 2016). The composition of debts provides an insight of the firms' priority structure of either following debt specialization or diversification strategy. Colla, Ippolito, and Li (2013) were amongst the first who highlighted the strategic importance of debt specialization. Since now scholars like Hanssens, Deloof, and Vanacker (2016); Li, Lou, Otto, and Wittenberg-Moerman (2016); Povoa and Nakamura (2014) diverted their attention to identifying the reasons of its existence. The main reasons for following debt specialization strategy are to minimize default risk, information opaqueness (Tengulov, 2015), agency conflicts, restricted access to some segments of the debt market (Lemmon & Zender, 2010).

However, a small group of scholars conducted the comparative studies and scrutinize the causes of debt specialization between the sub-classes of different categorical variables. Colla et al. (2013); Rauh and Sufi (2010) examined the debt specialization across credit quality distribution, but

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their findings contradict. Colla et al. (2013) found unrated companies incline more towards specialization whereas Rauh and Sufi (2010) stated that these firms use diversified debt structure. Malik and Afza (2016) believe group affiliated firms have more pronounced tendency of specialization than unaffiliated companies due to the benefit of internal capital market and cross loan guarantees to the financial institutions.

Khan, Qadeer, and Rizavi (2017) found a higher degree of specialization among small companies than large ones. They state small corporations adopt it to curtail expected default risk, agency conflicts, scrimp down information asymmetry and because of the restricted entrance to some segments of the debt market, whereas large companies follow it to reduce operational risk, lower down flotation cost and because of good reputation. These scholars have distinguished the reasons for debt specialization between the categorical grouping but do not address the sustenance of distinct degrees of specialization within the sub-group firms that cause variations in financial, strategic decision making.

This approach yields divergent acumen of the subsistence of debt specialization within the sub-groups and resolves some puzzling results documented by comparative studies. Therefore, we are going a step forward and conduct a comparative study of the profitability sub-groups to answer the yet unexplored questions. Firstly, do high and low profitable firms pursue debt specialization strategy for same reasons and with similar intensity? Secondly, how this decision affects the selection of debt structure composition? Finally, what are the determinants of debt specialization?

This study enriches the capital structure literature by contributing in the new strands of debt structure choices in the following way: First, it provides a new insight to the debt structure choices by explaining how firms' differential access to the debt market impact the debt structure composition and heterogeneity decision. Second, previously very little work on the reasons of debt specialization is conducted especially on the categorical reasoning. This study extends the evolving debate by discriminating between the reasons of profitability sub-groups based on distinct degrees of debt specialization. In this way, it provides directions to the managers to understand why they follow debt specialization strategy in the presence of multiple debt instruments.

Third, it examines the impact of different degrees of debt specialization on the level of profitability. Previously, scholars like Colla et al. (2013), Khan et al. (2017) and Malik and Afza (2016) distinguish the existence of debt specialization between the categories of credit rating, size and business group affiliation. a. This study is moving a step forward and provides a new direction to the comparative studies.

Literature Review

Debt Types and Debt Specialization

Prior capital structure literature focuses on debt-equity choices (Kadapakkam, Meisami, & Wald, 2016) by considering all types of debt uniform (Vithessonthi & Tongurai, 2015). Researchers examine leverage, as a measure of the cumulative impact of all debt types and ignore its distinct features in the form of maturity, covenant provisions, interest rate and adjustment costs, essential to understanding the variation in firm performance with similar leverage ratios (Davydov, 2016). These unique aspects of debt types are helpful in designing priority structure composition that explains the financial strategy trends over time. Hanssens et al. (2016) believed firms' future debt policies are based on its initial policies, established at the time of starting up and remain consistent over time.

Povoa and Nakamura (2014) confirmed the presence of both strands; debt specialization or diversification and argued that choice of debt largely depend on the organizational accessibility to the financial market. Consistently, Barclay and Smith (1995) found 26% companies employ single priority debt class while 3% go for diversified debt structure. Colla et al. (2013) confirmed the tendency of debt specialization among two-thirds of their sample firms which are highly dependent on the acquisition of senior bonds and notes. Johnson (1997) and Rauh and Sufi (2010) supported the presence of debt specialization in almost three-fourth firms which rely at least on two types of loans.

Khan et al. (2016) asserted the existence of debt specialization among 67% Pakistani firms on the short terms debts whereas Malik and Afza (2016) affirmed that 85% Pakistani firms mainly reliant on long-term secured and other non-current liabilities. All these scholars have confirmed the existence of debt specialization among their sample firms, but till now no study has addressed the variations in the tendency of specialization within grouping organizations that can influentially impact the deb structure choices. The current research is aimed to discuss the presence of a differential degree of specialization within organizations.

Reasons for Debt Specialization

The organizational preference for a distinct debt type is also linked with a specific reasoning. Bank debts are highly prioritized due to the benefit of a collateral provision that reduces asset substitution activities and is helpful in settling down agency conflicts, therefore, preferred on public debts (Meneghetti, 2012). Private debts are less information sensitive, having monitoring and renegotiable benefits (Morellec, Valta, & Zhdanov, 2015); and are beneficial in making effective liquidation decisions (Lin, Ma, Malatesta, & Xuan, 2013). While public bonds are obtained as a tool to resolve information asymmetries (Johnson, 1997).

Firms specialize in secured and short-term debts to reduce agency cost (Alderson, Bansal, & Betker, 2014). Short-term debts further act as a useful monitor that eliminate information asymmetry (Diamond, 1991) and underinvestment issues (Barclay & Smith, 1995). All these justifications leading towards the organizational objective to minimize cost and maximize benefits of debts; merely to achieve optimal debt structure. Consequently, debt specialization strategy is also followed to decrease bankruptcy cost, agency conflicts, information collection and monitoring costs and restricted access to the debt market (Colla et al., 2013; Khan et al., 2016). Poor accounting quality firms having few investment and debt financing opportunities, face high fluctuation in stock prices are ambitious to follow this strategy (Li et al., 2016; Tengulov, 2015).

Recently, Khan et al. (2017) describe the discriminating causes for the presence of debt specialization in a comparative study of size grouping. They confirm debt specialization exists among small companies for the similar reason discussed earlier, but larger companies use it to curtail operational risk, decline flotation cost and because of good reputation. The differential causes for debt specialization provides a new dimension to explore the reasons for debt specialization through a similar categorical grouping. We, therefore, conducted the present study to find out the causes of debt specialization within profitability sub-groups because of distinct degrees of specialization.

Determinants of Debt Specialization

The characteristics of the firms may vary when they borrow from a distant source of financing. Pessarossi and Weill (2013) argue that growing companies, with unique products and lower credit supply, prefer bonds. Persistently, Krishnaswami et al. (1999) and Denis and Mihov (2003) advocate the profitable, larger and high credit quality firms with more tangible assets be more likely

to issue bonds. Whereas growing, small, riskier, young, good credit rating firms with high volatile earnings (Liu, 2006) preferred traditional private debts like bank loans (Arena, 2011; Kaya, 2012). Firms preferring nonbank private debt maintain high cash ratio, face lower equity risk, fewer investment opportunities (Liu, 2006) and high growth opportunities (Ojah & Manrique, 2005). Small firms prefer short-term debts due to restricted access to bond market and high fixed cost associated with long-term debts (Beattie, Goodacre, & Thomson, 2006).

Contemporary corporate finance research suggests that diversified financing choices also exert different effects on the determinants of debt specialization. A study by Colla et al. (2013) suggested that new, small, unrated firms, with the relatively low level of profitability, leverage and tangibility pursue debt specialization strategy. Khan et al. (2016) believed the degree of specialization is highest among small, regulated, low leveraged and group affiliated firms. On the contrary, Povoa and Nakamura (2014) and Tengulov (2015) claimed that larger, profitable and rated companies with low business risk and leverage ratio, high growth opportunities and asset tangibility are mostly dependent on debt diversification strategy.

Khan et al. (2017) conducted a comparative study and described the discriminating characteristics of the firms involved in debt specialization in the categories of size (small and large). They claim to grow, unaffiliated companies with high default probability and low sale quality follow debt specialization strategy from the small firm sample. Whereas from the large firm sample regulated, low profitable companies having longer asset maturities and high volatile earnings seek for this approach. This empirical evidence suggests ultimate variations in the predictors of debt specialization among distant categorical variables and provides us the basis to find out the different determinants of debt specialization as well between the profitability groupings that further lead to identifying the reasons for its existence.

Method

Data Collection and Sample Description

To answer the above research questions, unbalanced panel dataset, extracted from balance sheet analysis reports of State Bank of Pakistan has been utilized. The sample of 419 firms listed at Pakistan Stock Exchange during 2009 to 2015, is selected by following criteria: First, we exclude financial companies (1351 firm-year observations) because they are substantially different regarding capital structure and accounting practices. Second, we delete 83 firm-year observations for missing data; Third 27 firm-year observations are eliminated, having total assets and debts zero. Finally, remove outliers (28 firm-year observations) by winsorizing all continuous variables up to 0.5^{th} upper and lower percentiles and end up at 2795 firm-year observations.

This study is intended to find out the degree of debt specialization within the profitability sub-groups of the organizations. For that purpose, we further evaluate 33^{rd} and 67^{th} percentile to segregate the low and high profitable firms. We followed the criteria of Gonzalez (2014) and Khan et al. (2016) who divided continuous variables like profitability, leverage, size, growth into lower and upper quartiles for comparison purpose. However, we used percentiles instead of quartiles to extend the range of the groups and ended up with low profitable firms (923) fall below 33^{rd} percentile while highly profitable companies (955) fall above the 67^{th} percentile.

Variables and Measurements

Following Hanssens et al. (2016) the dependent variable (debt specialization) is measured by using Herfindahl-Hirschman Index (HHI).

$$HHI= \{[(SSD/TD)^2 + (OSD/TD)^2 + (LSD/TD)^2 + (LUND/TD)^2 + (DEB/TD)^2 + (OLD/(TD)^2] - (1/6)\}/(1 - (1/6))$$

HHI is calculated based on all six debt types: short term secured debts (SSD), short term other debts (OSD), long term secured debts (LSD), long term unsecured debts (LUND), debenture (DEB), and other long term debts (OLD), employed by Pakistani organizations. Its value varies between 0 and 1 both inclusive. The highest value of HHI is the indication of greater degree of debt specialization while 0 show firms' priority for including all debt types in equal proportion.

The primary determinants of debt specialization include size which can be measured by either asset or sale (Li et al., 2016). Titman and Wessels (1988) argue that use of either of the measures not affect the parameter estimate of their structural model. However, this study adopts the logarithm of total assets (Leary, 2009) as a measure of size to test for robustness and to control possible heteroscedasticity and ensure linearity in the data because there may be the rapid changes in the volume of sale but the value of assets remains stable over the years.

Age is the time in years since the company announces its first IPO (Povoa & Nakamura, 2014). Cash holding is the ratio of a company's cash and cash equivalent assets including short-term investment to total assets (Tengulov, 2015). Leverage is measured as a ratio of total debt to book value of assets (Denis & McKeon, 2012). Asset tangibility measures the collateral level that organizations have when they pursue debt financing. It is calculated as a ratio of fixed and tangible assets including inventory to total assets (Booth, Aivazian, Demirguc-Kunt, & Maksimovic, 2001). Earnings volatility is measured by dividing standard deviation of annual profit before tax and depreciation over average assets.

Default risk is measured based on Altman Z-Score that indicates the credit strength of the organization. It is a metric which combines five quantifiable financial indicators to predict the financial position of the organization (Albring, Khurana, Nejadmalayeri, & Pereira, 2011). Sales growth is the logarithm of sale (Morellec et al., 2015) to see the year to year changes in the sale (Albring et al., 2011). The logarithm of sale is often used as a proxy for size (Carey, Post, & Sharpe, 1998). That is why this study adopts year to year changes in the sale as a measure of sale growth. Operating expenses ratio is the ratio of operating expenses to net sale that indicates the proportion of net sale consumed as operating costs available to meet financial and other costs (Colla et al., 2013).

Results and Discussion

Descriptive Statistics

Table 1 exhibit the descriptive information about two main sub-groups. The tests of differences (t-test and Wilcoxon test) are evident of the significant variations in the characteristics of sample firms based on profitability. On average, highly profitable companies are growing (12.1%), larger (3.54 million), holding more cash (7.5%), but they are not different regarding age (almost 22 years). While low profitable firms are having a high leverage ratio (71.8%), tangibility (7.4%), expense ratio (18%), earning volatility (11.3%) but their probability of default remains lower than the highly profitable firms.

The total sample results including the characteristics of both sub-classes, describe that generally, sample firms are larger with almost 3.2 million assets and the average age of 21 years. These firms are holding approximately 6% cash and 7% tangible assets, 6% leverage ratios with high-risk ratios; 10% earnings volatility and 13% default risk, having low growth rate (6%) and high expense ratio 15%. Overall, the values of standard deviation (<1), skewness (<4) and kurtosis (<4) for all variables show that there is no severe discrepancy in the data and results are reliable.

Existence of Debt Specialization

Table 2 caters new evidence for the existence of debt specialization between sub-groups of profitability. Thresholds are calculated as the fraction of firm-year observations in the sample that attains a considerable amount of loan from a specific source of financing. We include a broad range of thresholds from 10% to 90% to acme preference of the firms.

Table 1

Sample Overview: High and Low Profitable Firms

		Size	Age	Cash Holding	Leverage	Asset Tangibility	Earnings Volatility	Default Risk	Sale Growth	Expense Ratio
Profitability–Low	Mean	2.751	21.672	0.036	0.718	0.739	0.113	0.597	-0.017	0.180
Obs. (923)	Median	3.063	23.000	0.007	0.806	0.807	0.069	0.511	-0.005	0.073
	Std. dev.	0.526	0.633	0.093	0.266	0.222	0.131	1.101	0.401	0.284
	Min.	-1.066	1.000	0.001	0.001	0.001	0.001	-2.781	-1.000	-1.132
	Max.	35.787	32.000	1.000	0.999	1.000	0.774	4.672	1.555	1.893
	Skewness	2.754	-0.945	3.168	-1.182	-1.461	2.920	0.392	0.351	2.704
	Kurtosis	2.014	0.321	4.900	0.451	1.792	3.544	1.221	1.201	3.500
Profitability–High	Mean	3.538	21.954	0.075	0.562	0.664	0.097	1.821	0.121	0.127
Obs. (955)	Median	3.620	23.000	0.022	0.587	0.711	0.071	1.858	0.116	0.062
	Std. dev.	0.916	1.000	0.120	0.283	0.203	0.094	1.335	0.312	0.194
	Min.	-1.699	32.000	0.001	0.001	0.001	0.001	-2.979	-0.983	0.000
	Max.	5.397	7.478	1.000	0.999	0.999	0.738	4.660	1.623	1.896
	Skewness	-1.061	-0.972	2.873	-0.164	-0.867	3.165	-0.664	-0.025	2.538
	Kurtosis	2.782	0.494	2.668	-1.174	0.278	3.642	1.099	2.273	2.985
Overall	Mean	;	21.853	0.057	0.635	0.695	0.101	1.274	0.064	0.146
Obs. (2795)	Median	3.379	23.000	0.013	0.698	0.749	0.068	1.232	0.063	0.065
	Std. dev.	0.253	0.516	0.111	0.283	0.215	0.112	0.333	0.359	0.234
	Min.	-1.699	1.000	0.001	0.001	0.001	0.001	-2.979	-1.000	-1.132
	Max.	35.787	32.000	1.000	0.999	1.000	0.774	4.672	1.623	1.896
	Skewness	3.639	-0.975	3.955	-0.576	-1.078	1.215	-0.064	0.071	3.536
	Kurtosis	3.612	0.450	2.142	-0.848	0.767	2.589	0.159	1.613	3.347
Test of Differences	t-test	15.189***	0.929**	9.296***	-14.133***	-8.803***	-3.408***	25.110***	9.428***	-5.311***
between Samples	Wilcoxon Test	8.333***	0.882**	5.302***	7.521***	6.303***	1.369**	12.856***	6.726***	2.541***

* P < 0.1, ** P < 0.05, *** P < 0.01

Results specify that low profitable businesses show more inclination towards debt specialization strategy than high profitable companies that support the claim of Tengulov (2015) who state profitable businesses prefer diversified types of debt. The test of differences (t-test and Wilcoxon test) support our notion that there is a difference in the usage of debt by the sub-groups. Low (High) profitable firms 93% (89%) acquire more than 30% loan from a single debt type. 66%

(14%) low profitable businesses attain more than 40% (80%), while 62% (10%) high profitable companies get more than 40% (80%) loan from a single source of financing.

Table 1

Categorical Thresholds Analysis

Thresholds	Category	Types of Debt						Total
		SSD	OSD	LSD	LUND	DEB	OLD	
10%	Low	0.259	0.258	0.336	0.259	0.371	0.420	1.903
	High	0.266	0.244	0.355	0.355	0.638	0.380	2.238
20%	Low	0.217	0.195	0.241	0.198	0.207	0.228	1.286
	High	0.222	0.201	0.236	0.222	0.138	0.218	1.237
30%	Low	0.178	0.143	0.159	0.158	0.155	0.137	0.929
	High	0.177	0.154	0.157	0.170	0.103	0.129	0.891
40%	Low	0.137	0.109	0.111	0.117	0.103	0.083	0.661
	High	0.133	0.120	0.102	0.099	0.086	0.089	0.629
50%	Low	0.097	0.091	0.071	0.092	0.060	0.060	0.472
	High	0.092	0.095	0.072	0.061	0.017	0.060	0.398
60%	Low	0.058	0.071	0.039	0.073	0.043	0.029	0.313
	High	0.058	0.075	0.036	0.050	0.017	0.049	0.284
70%	Low	0.033	0.059	0.027	0.050	0.034	0.022	0.225
	High	0.033	0.054	0.019	0.027	0.000	0.038	0.171
80%	Low	0.016	0.044	0.012	0.037	0.017	0.011	0.137
	High	0.016	0.039	0.011	0.014	0.000	0.023	0.104
90%	Low	0.005	0.031	0.002	0.015	0.009	0.010	0.073
	High	0.004	0.018	0.011	0.002	0.000	0.014	0.048
Test of Differences between Samples	**t-test**	0.394**	1.533**	-0.264**	-7.691***	-2.527**	5.740***	1.392***
	Wilcoxon Test	1.095**	1.986**	0.904**	3.827***	0.315***	4.279***	1.621***

* P < 0.1, ** P < 0.05, *** P < 0.01

Debt Specialization Within Profitability Sub-Groups

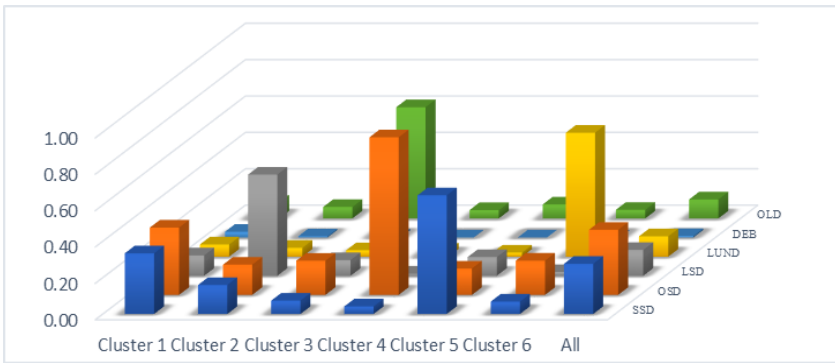
After confirming the presence of debt specialization, we need to check the degree of debt specialization occurrence within profitability sub-groups. Despite following the criteria of Colla et al. (2013) and Khan et al. (2016) who believe organizations obtaining 85% or 75% loan from a single debt type are called specialized firms. We have divided the degree of specialization from low to very high spectrum, describing as Low (41-55%), Moderate (56-70%), High (71-85%) and Very High (86-100%). We use cluster analysis for this purpose which is a grouping technique that combines the firms having identical characteristics within the cluster but different from other clusters.

First, we explain the graphical presentation of cluster analysis shown in Figure 1 (a, b, c) that presents firm-year observations, assembled per the priority debt structure of the organizations. These figures are plotted based on mean ratios of all the debt type included in the clusters, the total debt ratios for each debt type are also included for comparison purpose only. Fig. 1(a) show that high degree of specialization takes place in cluster 1 where firms sole relies on other short-term debts. In

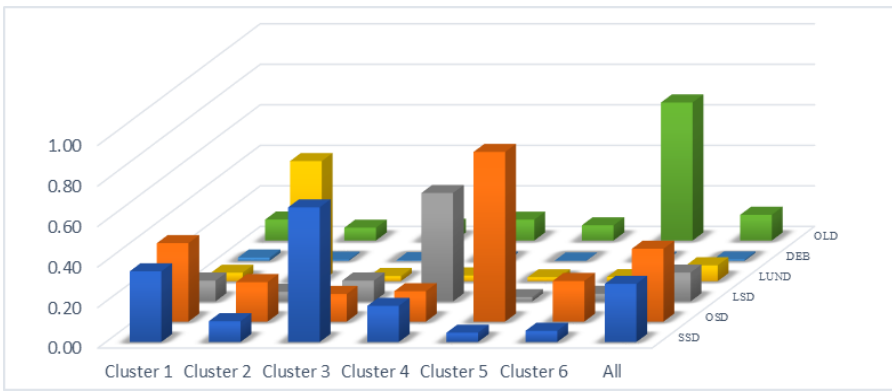
cluster 6, long-term debts dominate, short-term secured debts got a prominent place in cluster 5, companies depend on other long-term debts in cluster 3 and cluster 2, long-term secured debts remain favorites among the sample firms. In contrast, cluster 1 shows the preferences of the firm on at least two types of debt (short-term secured and other short-term debts.

Fig. 1(b) describe the trends of specialization among high profitable firms. The degree of specialization is less pronounced among these firms. Debt specialization takes place in cluster 1 where firms exclusively borrow from other short-term debts. In cluster 2, other long-term debts; in cluster 4 short-term secured debts and cluster 3 long-term secured debts remain the prevalent source of financing among high profitable firms. The results of total samples are also included for comparison purpose that presents the fusion of both profitability grouping results. However, one notable fact about the debt structure of Pakistani firms is that they either predominantly specialize in other short-term debt or include it on a second priority basis in their debt structure.

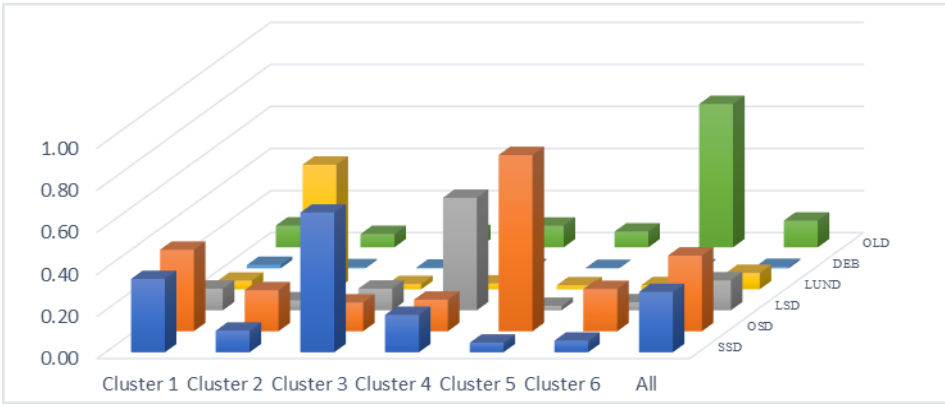
Figure 1. Usage of debt types within profitability sub-samples



(a) Low Profitable Firms



(b) High Profitable Firms



(c) All Profitable Firms\

Table 3 reports the variation in the degree of specialization (48-87%) among all the firms for both profitability sub-groups and the whole sample firms for comparison purpose. We observe overall 67% of low and 64% of highly profitable companies are involved in debt specialization. However, in some clusters degree of specialization is very high or high as in cluster 4 of Panel A, debt specialization is 87%, in cluster 1 of Panel B is 81% and even in cluster 5 of Panel C is 84%, but all the sample firms specialize in other short-term debts. Whereas in some clusters low degree of debt specialization existed as in cluster 1 (56% borrow long-term secured debts), in cluster 5 (48% lend long-term unsecured debts) and in cluster 4 (54% lend long-term secured debts) for low, high and total profitable firms respectively.

In cluster 3, 4, 6 moderate degree of debt specialization prevails where low profitable firms specialize in another long-term, short-term secured and long-term unsecured debts respectively. High profitable companies, adopt a low, moderate and high degree of debt specialization where they specialized in long-term secured, short-term secured and other long-term respectively in cluster 3,4,2. In all these clusters, the second priority debt is short-term debts either short-term secured or other. Even when both the sub-groups firms go for debt diversification strategy, also rely on short-term debts jointly (Low:70%; High:76%; Overall: 74%).

Table 2

Cluster Analysis for Profitability Groupings

Panel A. Low-Profit Firms

Cluster	Debt Types						HHI	Obs.
	SSD	OSD	LSD	LUND	DEB	OLD		
1	0.333	0.370	0.112	0.067	0.032	0.085	0.227	214
	[0.355]	[0.368]	[0.087]	[0.000]	[0.000]	[0.068]	[0.196]	
2	0.159	0.166	**0.556**	0.049	0.006	0.063	0.338	147
	[0.132]	[0.148]	[0.518]	[0.000]	[0.000]	[0.027]	[0.295]	
3	0.073	0.188	0.086	0.036	0.005	**0.612**	0.440	62
	[0.001]	[0.171]	[0.002]	[0.000]	[0.000]	[0.530]	[0.381]	
4	0.042	**0.866**	0.011	0.033	0.001	0.046	0.762	223

	[0.000]	[0.928]	[0.000]	[0.000]	[0.000]	[0.000]	[0.840]	
5	**0.653**	0.145	0.103	0.023	0.001	0.077	0.425	165
	[0.635]	[0.131]	[0.070]	[0.000]	[0.000]	[0.040]	[0.368]	
6	0.068	0.188	0.020	**0.682**	0.000	0.047	0.532	112
	[0.000]	[0.158]	[0.000]	[0.689]	[0.000]	[0.008]	[0.432]	
All	0.276	0.358	0.142	0.112	0.008	0.105	0.456	923
	[0.222]	[0.253]	[0.024]	[0.000]	[0.000]	[0.031]	[0.377]	

SSD = Short Term Secured; OSD = Short Term Other; LSD = Long Term Secured; LUND = Long Term Unsecured; DEB = Debenture; OLD = Other Long Term Debts

Table 3. —*Continued*

	Panel B. High-Profit Firms								Panel C. Complete Sample Firms							
Cluster	Debt Types						HHI	Obs.	Debt Types						HHI	Obs.
	SSD	OSD	LSD	LUND	DEB	OLD			SSD	OSD	LSD	LUND	DEB	OLD		
1	0.050	**0.806**	0.028	0.009	0.001	0.106	0.647	238	0.349	0.388	0.103	0.041	0.016	0.104	0.233	630
	[0.000]	[0.811]	[0.000]	[0.000]	[0.000]	[0.065]	[0.622]		[0.364]	[0.393]	[0.081]	[0.000]	[0.000]	[0.077]	[0.215]	
2	0.059	0.198	0.033	0.003	0.003	**0.704**	0.549	93	0.102	0.195	0.047	**0.592**	0.006	0.063	0.435	249
	[0.000]	[0.186]	[0.000]	[0.000]	[0.000]	[0.674]	[0.452]		[0.045]	[0.180]	[0.000]	[0.550]	[0.000]	[0.014]	[0.351]	
3	0.182	0.145	**0.534**	0.017	0.001	0.120	0.323	142	**0.664**	0.137	0.103	0.025	0.003	0.068	0.437	662
	[0.166]	[0.126]	[0.520]	[0.000]	[0.000]	[0.080]	[0.268]		[0.644]	[0.128]	[0.073]	[0.000]	[0.000]	[0.035]	[0.395]	
4	**0.677**	0.128	0.104	0.023	0.003	0.065	0.451	181	0.178	0.150	**0.535**	0.028	0.006	0.103	0.322	435
	[0.663]	[0.126]	[0.075]	[0.000]	[0.000]	[0.038]	[0.410]		[0.160]	[0.136]	[0.508]	[0.000]	[0.000]	[0.059]	[0.268]	
5	0.132	0.221	0.073	**0.484**	0.005	0.091	0.319	86	0.045	**0.838**	0.021	0.019	0.002	0.075	0.705	617
	[0.100]	[0.227]	[0.019]	[0.407]	[0.000]	[0.043]	[0.209]		[0.000]	[0.857]	[0.000]	[0.000]	[0.000]	[0.016]	[0.705]	
6	0.369	0.394	0.096	0.028	0.007	0.106	0.240	215	0.055	0.201	0.038	0.020	0.005	**0.682**	0.521	202
	[0.382]	[0.397]	[0.071]	[0.000]	[0.000]	[0.078]	[0.230]		[0.000]	[0.176]	[0.000]	[0.000]	[0.000]	[0.645]	[0.432]	
All	0.280	0.377	0.140	0.052	0.003	0.148	0.430	955	0.287	0.360	0.142	0.078	0.007	0.127	0.438	2,795
	[0.236]	[0.303]	[0.039]	[0.000]	[0.000]	[0.072]	[0.373]		[0.242]	[0.272]	[0.039]	[0.000]	[0.000]	[0.054]	[0.368]	

SSD = Short Term Secured; OSD = Short Term Other; LSD = Long Term Secured; LUND = Long Term Unsecured; DEB = Debenture; OLD = Other Long Term Debts

Table 4

Tendency of Specialization Across Organizations

Debt Types	Low Profitable Firms				High Profitable Firms				Overall Sample			
	Low (41-55%)	Moderate (56-70%)	High (71-85%)	Very High (86-100%)	Low (41-55%)	Moderate (56-70%)	High (71-85%)	Very High (86-100%)	Low (41-55%)	Moderate (56-70%)	High (71-85%)	Very High (86-100%)
SSD	0.478	0.622	0.763	0.945	0.476	0.624	0.764	0.932	0.476	0.623	0.763	0.939
	[0.475]	[0.615]	[0.763]	[0.952]	[0.473]	[0.625]	[0.761]	[0.934]	[0.474]	[0.621]	[0.761]	[0.938]
	131	**103**	**52**	**21**	**142**	**94**	**52**	**36**	**428**	**284**	**163**	**71**
OSD	0.485	0.619	0.759	0.974	0.471	0.632	0.773	0.950	0.476	0.628	0.767	0.963
	[0.486]	[0.619]	[0.752]	[1.000]	[0.467]	[0.638]	[0.771]	[0.961]	[0.475]	[0.633]	[0.763]	[0.991]
	91	**52**	**41**	**112**	**114**	**103**	**47**	**60**	**289**	**214**	**163**	**312**
LSD	0.472	0.608	0.765	0.915	0.478	0.612	0.771	0.933	0.473	0.611	0.780	0.942
	[0.471]	[0.598]	[0.773]	[0.919]	[0.474]	[0.595]	[0.768]	[0.938]	[0.471]	[0.597]	[0.597]	[0.940]
	67	**35**	**23**	**12**	**47**	**36**	**12**	**15**	**171**	**100**	**50**	**21**
LUND	0.480	0.648	0.782	0.947	0.457	0.659	0.754	0.936	0.471	0.653	0.774	0.943
	[0.479]	[0.642]	[0.789]	[0.954]	[0.450]	[0.684]	[0.744]	[0.931]	[0.470]	[0.662]	[0.757]	[0.947]
	29	**19**	**16**	**18**	**25**	**15**	**10**	**5**	**67**	**52**	**34**	**37**
DEB	0.485	0.622	0.786	0.803	0.490	0.000	0.000	0.000	0.474	0.634	0.786	0.804
	[0.485]	[0.602]	[0.779]	[0.803]	[0.490]	[0.000]	[0.000]	[0.000]	[0.472]	[0.617]	[0.779]	[0.804]
	1	**4**	**3**	**1**	**2**	**0**	**0**	**0**	**4**	**5**	**3**	**2**
OLD	0.479	0.642	0.773	0.963	0.459	0.636	0.786	0.976	0.464	0.632	0.782	0.970
	[0.478]	[0.645]	[0.789]	[0.997]	[0.452]	[0.672]	[0.787]	[1.000]	[0.459]	[0.636]	[0.787]	[0.947]
	30	**12**	**7**	**12**	**41**	**31**	**16**	**30**	**93**	**54**	**28**	**51**
All	0.480	0.627	0.771	0.925	0.472	0.527	0.641	0.788	0.497	0.630	0.775	0.927
	[0.479]	[0.617]	[0.776]	[0.953]	[0.470]	[0.631]	[0.764]	[0.936]	[0.472]	[0.627]	[0.762]	[0.944]
	349	**225**	**142**	**176**	**371**	**279**	**137**	**146**	**1047**	**709**	**441**	**494**

Tendency of Specialization Across Organizations

Table 4 explains the trend of debt specialization across organizations by dividing the degree of specialization in low to very high levels. We have calculated the mean [median] values of the firm-year observations that fall within a defined scale for each of the degrees of debt specialization. For example, (41-55%) describing low, (56-70%) refer to moderate, (71-85%) including high and (86-100%) indicating very high propensity of specialization. We also include some firms in each level for profitability grouping as well as for total sample to provide a better understanding of the tendency of debt specialization across organizations.

The results show that low profitable firms have more declivity towards debt specialization in both high and very high categories as compared to top profitable companies. 176(146) and 142(137) Low (High) profitable firms involve in very high and high degrees of specialization respectively. The firm-year observations for the low and moderate degree of specialization are greater in highly profitable companies 39% and 29%. Short-term debts dominate in both profitability grouping and total sample at all levels of specialization. However, in case of long-term debts, long-term secured debts remain a favorite source of financing for low profitable firms while other long-term debts gain the prominent place among the highly profitable companies in Pakistan.

Determinants of Debt Specialization

To find out the determinants of debt specialization for profitability sub-groups, we need to employ the ordered logistic model which is suitable for dichotomous dependent variables, allowing for more than two (ordered) response categories (Cameron & Trivedi, 2010). To check the variation in specialization within profitability subgroups, first, we must assign the codes to each defined scale based on HHI. The greatest value of HHI is the indication of the highest degree of debt specialization while 0 means no specialization. The codes are allocated as 0 for no specialization (< 40%), 1 for low (41-55%), 2 for moderate (56-70%), 3 for high (71-85%) and 4 for very high (86-100%). We then apply ordered logistic model because dependent variable (HHI) has more than two categories with the meaningful sequential order (Cameron & Trivedi, 2010). The estimated equations of the ordered logistic models extracted from Table 5 are written below:

For Low Profitable Firms

$$S_1 = .004X_1 - .012X_2 - 1.309X_3 - .164X_4 - .521X_5 + .095X_6 + .049X_7 + .002X_8 + .234X_9 \quad (1)$$

For High Profitable Firms

$$S_2 = -0.112Y_1 - .003Y_2 - .055Y_3 - .360Y_4 - .591Y_5 - 1.017Y_6 - .166Y_7 - .052Y_8 - .664Y_9 \quad (2)$$

For Complete Sample Firms

$$S_3 = -0.447Z_1 - .007Z_2 + 2.568Z_3 - 1.823Z_4 - 1.816Z_5 + 1.966Z_6 + .001Z_7 - .343Z_8 - .126Z_9 \quad (3)$$

These equations estimate the score 'S' as a linear function of X's, Y's and Z's (Hamilton,

2012). In Table 5, we can only interpret the signs not magnitude of the coefficients. In the low profitability, sub-group, large, risky, growing firms with high expense ratios are more likely to be in the higher degrees of debt specialization as compared to top profitable companies. However, new companies with low cash holdings, leverage ratio, and asset tangibility adopt debt specialization strategy for both profitability grouping.

Table 5

Ordered Logistic Models for Profitability Sub-Groups

Variables	Low		High		Overall Sample	
	Model 1		Model 2		Model 3	
	Coef.	S.E	Coef.	S.E	Coef.	S.E
Size	0.004***	[0.039]	-0.112***	[0.067]	-0.447***	[0.044]
Age	-0.012***	[0.008]	-0.003***	[0.007]	-0.007**	[0.005]
Cash Holding	-1.309**	[0.728]	-0.551***	[0.514]	2.568***	[0.461]
Leverage	-0.164**	[0.246]	-0.360**	[0.227]	-1.823***	[0.165]
Asset Tangibility	-0.521***	[0.286]	-0.591***	[0.298]	-1.816***	[0.199]
Earnings Volatility	0.095***	[0.444]	-1.017**	[0.597]	1.966***	[0.335]
Default Risk	0.049**	[0.064]	-0.116*	[0.049]	0.001*	[0.038]
Sale Growth	0.002***	[0.149]	-0.052**	[0.181]	-0.343**	[0.117]
Expense Ratio	0.234*	[0.233]	-0.664**	[0.326]	-0.126**	[0.189]
cut1	-0.135	[0.369]	-1.158	[0.449]	-3.214	[0.289]
cut2	0.652	[0.369]	-0.255	[0.449]	-2.168	[0.285]
cut3	1.058	[0.370]	0.226	[0.456]	-1.643	[0.284]
cut4	1.436	[0.372]	0.753	[0.452]	-1.110	[0.283]
LR Chi-Square	11.220**		16.510**		701.130***	
No. of Observations	923		955		2795	
Pseudo R2	0.004		0.005		0.099	

* P < 0.1, ** P < 0.05, *** P < 0.01

The marginal effect for both profitability sub-groups are also evaluated to predict the degrees of specialization (No, Low, Moderate, High, Very High) within firms. Table 6 complements the findings of Table 5 by stating large high profitable companies with higher risk, growth rate, and expense ratios are more likely to be involved in lower categories of debt specialization in contrast to small low profitable companies. The level of significance may deviate at different degrees, but the direction of relation remains similar.

Table 6

Ordered Logit Marginal Effect Across Distinct Degrees of Specialization

Variables	Degree of Specialization among Low-Profit Firms					Degree of Specialization among High-Profit Firms					Degree of Specialization among Overall Sample				
	No	Low	Mod.	High	V. High	No	Low	Mod.	High	V. High	No	Low	Mod.	High	V. High
Size	0.001**	0.000**	0.000**	0.000**	0.001**	0.028**	-0.007***	-0.005***	-0.005***	-0.011***	0.111***	-0.032***	-0.022***	-0.019***	-0.038***
	[0.010]	[0.002]	[0.001]	[0.001]	[0.005]	[0.016]	[0.004]	[0.003]	[0.003]	[0.006]	[0.011]	[0.004]	[0.003]	[0.002]	[0.004]
Age	-0.003**	-0.001**	-0.000**	-0.000*	-0.002*	-0.001***	-0.000**	-0.000**	-0.000**	-0.000***	-0.002**	-0.001***	-0.000**	-0.000***	-0.001**
	[0.002]	[0.000]	[0.000]	[0.000]	[0.001]	[0.002]	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]
Cash Holding	0.325*	-.060**	-0.050**	-0.046**	-0.169**	0.136*	-0.034**	-0.025***	-0.025***	-0.053***	-0.637***	0.186***	0.127***	0.109***	0.216***
	[0.181]	[0.034]	[0.028]	[0.026]	[0.094]	[0.127]	[0.032]	[0.024]	[0.023]	[0.049]	[0.115]	[0.035]	[0.025]	[0.021]	[0.040]
Leverage	0.041*	-.008***	-0.006***	-0.006***	-0.021***	0.089***	-0.022***	-0.017***	-0.016***	-0.034***	0.452***	-0.132***	-0.090***	-0.077***	-0.153***
	[0.061]	[0.011]	[0.009]	[0.009]	[0.032]	[0.056]	[0.014]	[0.010]	[0.010]	[0.022]	[0.041]	[0.015]	[0.010]	[0.009]	[0.015]
Asset Tangibility	0.130*	-.024***	-0.020**	-0.018***	-0.067**	0.146*	-0.036***	-0.027***	-0.026***	-0.056***	0.450***	-0.131***	-0.090***	-0.077***	-0.153***
	[0.071]	[0.014]	[0.011]	[0.010]	[0.037]	[0.074]	[0.019]	[0.014]	[0.014]	[0.029]	[0.049]	[0.017]	[0.012]	[0.010]	[0.018]
Earnings Volatility	-0.024*	0.004***	0.004***	0.003**	0.012***	0.252**	-0.062*	-0.047*	-0.046**	-0.097**	-0.488***	0.142**	0.097***	0.083***	0.166***
	[0.110]	[0.021]	[0.017]	[0.016]	[0.057]	[0.148]	[0.037]	[0.028]	[0.027]	[0.057]	[0.083]	[0.026]	[0.018]	[0.015]	[0.029]
Default Risk	-0.012*	0.002*	0.002*	0.002*	0.006**	0.029*	-0.007*	-0.005	-0.005	-0.011*	0.000*	0.000*	0.000*	0.000	0.000*
	[0.016]	[0.003]	[0.002]	[0.002]	[0.008]	[0.012]	[0.003]	[0.002]	[0.002]	[0.005]	[0.009]	[0.003]	[0.002]	[0.002]	[0.003]
Sale Growth	-0.001***	0.000**	0.000**	0.000**	0.000**	0.013***	-0.003**	-0.002**	-0.002**	-0.005***	0.084**	-0.025***	-0.017**	-0.014**	-0.029**
	[0.037]	[0.007]	[0.006]	[0.005]	[0.019]	[0.045]	[0.011]	[0.008]	[0.008]	[0.017]	[0.029]	[0.009]	[0.006]	[0.005]	[0.010]
Expense Ratio	0.058*	.011**	0.009*	0.008*	0.030*	0.164*	-0.041**	-0.030**	-0.030**	-0.063**	0.031**	-0.009*	-0.006**	-0.005**	-0.011**
	[0.009]	[0.003]	[0.009]	[0.003]	[0.060]	[0.081]	[0.020]	[0.015]	[0.015]	[0.031]	[0.047]	[0.014]	[0.009]	[0.008]	[0.016]

**** P < 0.1, ** P < 0.05, *** P < 0.01***

Possible Explanations for Debt Specialization

The possible reasoning for following debt specialization strategy is: to minimize expected default risk, information asymmetry, good reputation and accessibility to the debt market.

High profitable firms adopt debt specialization strategy due to good build in reputation and greater accessibility to the debt market with lower debt covenants (Sufi, 2009). Larger and mature firms with high growth opportunities are in a good negotiation position with the lender. Therefore, they can select the debt instrument under their motive of cost minimization, i.e., go for debt specialization strategy. Also, Denis and Mihov (2003) stated that if the firms have built up access to a particular source of financing then generally they will acquire it again. However, the negative relation between sale growth, earnings volatility and default risk with debt specialization also explain that highly profitable firms confront less default risk, agency conflicts, and information asymmetry.

On the contrary, the low profitable firms adopt debt specialization strategy to reduce their probability of default and information asymmetry. Their high expense ratio, default risk, and volatile earnings are leading them towards liquidation risk. If these companies added a new loan in their debt structure, then the creditor will demand additional covenants for that due to security purpose which created conflicts of interest among different claim holders (Li et al., 2016). These clashes turn out to

be more severe at the time of financial crisis, when the demand for additional covenants become necessity specifically for the high leveraged, low profitability firms having high chances of default (Lou & Otto, 2015). Therefore, these organizations shifted towards debt specialization strategy.

Low profitable firms face high information asymmetry. Size and asset tangibility is used as a proxy for information asymmetry (Rajan & Zingales, 1995). Small businesses with low asset tangibility are more inclined towards debt specialization. These companies voluntary present themselves for monitoring (Denis & Mihov, 2003) to reduce information asymmetry (Chemmanur & Fulghieri, 1994). Sometimes they are required to be monitored if they are involved in some suspicious activities like asset substitution that make them incredulous among different stakeholders (Meneghetti, 2012). So to reduce their information collection and monitoring cost, they will prefer to follow debt specialization strategy.

Conclusively, the present study confirms the existence of debt specialization within profitability sub-categories based on discriminating degrees of specialization. We also provide theoretical and empirical grounds to support our notion, but we acknowledge that our test cannot clearly discriminate among the reasoning of debt specialization. For instance, size is used as a measure of information asymmetry for low profitable firms and the same variable can be adopted to explain the accessibility from companies towards debt market. Similarly, growth opportunities can be used as a proxy for asymmetric information, and at the same time, it can be acted to measure the agency conflict. Therefore, we are looking forward to the future researchers to build up instrumental variables that differentiate the causes of debt specialization.

Conclusion

This study identifies the determinants of profitability sub-groups based on distinct levels of debt specialization for all non-financial publicly traded firms during 2009-2015. There are four key findings of the paper. First, the results document a significant difference in the usage of debts between the profitability grouping. Low profitable firms show more inclination towards debt specialization strategy than high profitable companies. Second, variation in the intensity of specialization also existed within the profitability sub-groups. Low profitable companies are more associated with the highest declivity of debt specialization whereas, among the top profitable companies, the low and moderate tendency of debt specialization is found. The firms' choices of debt structure also vary because of this difference, but short-term debts remain prominent in both categories; 65% low and 68% high profitable Pakistani firms specialize in short-term debts.

In case of long-term debts, long-term secured debts remain a favorite source of financing for low profitable firms while other long-term debts gain the prominent place among the highly profitable companies in Pakistan. Third, small, top profitable companies with low-risk level, growth opportunities, and expense ratios are more likely to be involved in top categories of debt specialization in contrast to more modest low profitable companies. However, there is no difference in the age, level of cash holding, leverage ratios and asset tangibility of the businesses following debt specialization strategy. All the new companies having low leverage ratios, cash holdings and tangible asset prefer debt specialization strategy irrespective of their profitability grouping. Fourth, the leading reasons for following debt specialization strategy are good reputation and accessibility to the debt market for highly profitable firms while low profitable firms pursue it to reduce their information asymmetry and expected default risk.

Our findings underscore the need for future research on the strategic perspective of debt structure choices to find out more reasons for debt specialization between different profitability sub-groups. For that, we need to go beyond the traditional firm-level determinants and find out some new and unexplored organizational and non-organizational factors affecting debt specialization decision. Second, until now existence of debt specialization is unveiled among the categories of credit rating (Colla et al., 2013), size (Khan et al., 2017) and business group affiliation (Malik & Afza, 2016) but still more comparative studies are needed in other categories of variables like size, growth, regulation, etc. to analyse the influence of different degrees of debt specialization on organizational performance.

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