SECTOR-WISE ANALYSIS FOR DEBT MATURITY STRUCTURES IN SHARIAH-COMPLIANT AND CONVENTIONAL FIRMS OF PAKISTAN

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***ABSTRACT**: In this paper, we conduct sector-wise analysis, regarding debt maturity structures in various Shariah-compliant and conventional sectors of Pakistan. The objective of this research is to highlight the differences and similarities in the determinant variables of debt maturity structures and the managerial behaviour in decision making. To test our hypotheses this study uses regression fixed effect and random approaches by applying two models to explore two main objectives of the study, the determinants of debt maturity structure and managerial behaviour while deciding the debt maturity structure of various sectors. The findings demonstrate some differences and similarities in different determining variables of debt maturity structures in the Shariah-compliant and conventional sectors. We observed the difference in the managerial behaviour in deciding the debt maturity structure in the sectors consisting of Shariah-compliant and conventional firms. The results suggest that there exists self-interest factor in the managerial behaviour of most of the conventional sectors while deciding maturity of debt, whereas managerial behaviour is trustworthy in most of the Shariah-compliant sectors with some exceptions, thus proving the hypotheses of the study. This study may guide the investors, firms and policymakers while deciding fund management and can see the real picture of financial managers' behaviour from a broader perspective. The stakeholders can also arbitrate the determinants of debt maturity structure in the various sectors and the behaviour of managers. Therefore, the stakeholders may act or decide for the business investment accordingly.*

***KEYWORDS:** Debt maturity, managerial behaviour, conventional firms, Shariah-compliant firms*

1. Introduction: The shariah-compliance is the most important Islamic concept for which Islamic and financial institutions are taking interest to set unique market trends and instrumental growth of Islamic investment. At the beginning of the century, the Islamic capital market emerged and accelerated in recent years. The emerging impacts of Shariah firms give the growing market and participation to the ethical and religiously motivated investors resulting increase in stocks and capital markets (Omran2009). Otherwise, these investors would have found no such market to fulfil their needs according to their belief to avoid uncertain activities from a religious point of view. The ethically and religiously forbidden activities are such as *"gharar"* that is uncertainty or deceit, speculation or gambling (Elgari, 1993). Shariah-Compliant firms, thus, not only appeal Muslim investors but also have the potential to attract a large chunk of ethically thoughtful investors who would prefer to avoid evil industries (El Qorchi, 2005).

To serve the purpose of Islamic investors with Shariah-compliance concept in business, various Islamic countries of the world are following the Shariah principles. In Pakistan, companies are also operating under Shariah-principles. For the qualification of a company to be a Shariah-compliant firm different criteria are set. The debt ratio criterion for Shariah-compliant firms in Pakistan is up to 37%. This limit of debt ratio in the capital structure exerts the potential effect on the debt maturity structure of the firms. Some of the important properties of a Shariah-compliant firm have realized as the essential features of choosing the debt maturity structure in the literature of finance. Therefore, we choose the area of this study

to find out the essential influencing features of debt maturity structure in the sectors of Pakistan following Shariah-compliance as well as the conventional approach. The matching principle can be applied for the Shariah firms until their borrowing capacity is under the level of maximum debt ratio according to Shariah screening guidelines. Hence, knowing the importance of this area of study, we explore and compare the debt maturity determining factors in Shariah-compliant and conventional sectors of Pakistan.

Noticeably, most of these studies have been carried out in the developed world with very little is known about the less developed countries (LDCs), where firms are not as free to choose the maturity structure of their choice due to the underdeveloped financial and capital markets. This leads us to a question as to which factors affect the firm's debt maturity choices given the constraints faced by these firms in LDCs. Recent research has also focused on the effect of religion on corporate debt maturity structure. Current research indicates a significant relationship between religion and capital structure choices of firms. For example, see Baxamusa and Jalal (2014), Gunn and Shackman (2014). Despite the presence of the Shariah principles which govern the capital structure of Shariah-compliant firms and make them different from conventional firms, there appears a lack of research comparing Shariah-compliant and conventional firms on various aspects of their capital structure and debt maturity structure.

The context of this study is to investigate the debt maturity structure in Shariah-compliant and conventional firms for the firms in Pakistan. Although extensive research has also been carried out on developed countries for conventional firms, no single study exists which examine trustworthiness in the managerial behaviour in financial decisions of Shariah-compliant firms, therefore; this research may connect the religious factor in the corporate finance decisions. Our research, therefore, is a maiden attempt to investigate the managerial trustworthiness in the financial decision making of Shariah-Compliant firms, in the light of Islamic principles. Therefore, developing countries, especially Pakistan being an Islamic state is having a considerable dearth of studies on the non-financial sector from a Shariah perspective. The context of our study is Pakistan thus it will not be suitable to generalize her with other countries.

Importance of the study The importance of debt maturity structure in the capital and other financial decisions arises from several reasons. Firms may time debt maturity to their asset structure to avoid untimely and forced liquidation of its assets (Diamond, 1991). The choice of debt maturity may also signal the earning's quality of firms to outsiders (Flannery, 1986). Agency issues within the firm may also be addressed through varying debt maturity structure of firms (Miller, 1977). Debt maturity gains importance also in considering issues like financing flexibility, the cost of financing, and refinancing risk. Diamond (1991) explains the notion of maturity concerning cash flows attached to the firm's assets and financial obligations like debt. The debt is short term if it falls due before the project's cash flows begin to arrive. This suggests that maturity is a phenomenon of cash flow timing rather the calendar year. This paper is further outlined as follows. The next section tow describes the literature review, section three discusses the methodology part of the study, and section four is all about the analysis of various sectors for Shariah-compliant sectors and conventional sectors. The fifth and last section provides the conclusion of this study.

2. Literature Review Thus, the inclusion of debt in capital structure has long been recognized as a tool to mitigate agency conflicts between shareholders and managers (Jensen

and Meckling, 1976, (Grossman & Hart, 1982). In the same vein, the debt maturity structure is also considered to align otherwise conflicting interests of managers with shareholders (Myers 1977; Barclay and Smith 1995). In financing decisions, managers have the discretion not only to determine the debt level in the capital structure but also to choose the duration of borrowing. As a result, choice of debt and its maturity are themselves subject to potential agency costs (Datta et al. 2005, Berger, 2005).

The choice of debt maturity is rarely made in isolation for a host of un ignorable reasons. Short-term maturity, for example, has lower agency-related costs than longer maturity. Lowering maturity could forestall underinvestment or overinvestment tendency among managers. One of the important outcomes of borrowing for the short term is its effectiveness in building systematically repetitive monitoring mechanism that puts management's interest well aligned with those of shareholders'. Thus, the debt maturity structure has a direct link with the monitoring frequency of the firm by investors. Given the fact that management decides most of the times to form amount, timing and maturity structure of financing, only the management with its interests strongly linked owners' would prefer short-term debt. In contrast to this, in most of the cases, self-serving managers having misaligned interests would entrench themselves by borrowing longer-term to retain their autonomy and avoid frequent monitoring. However, Myers (1977) argues that managers with some positive news not yet publicized might borrow for a shorter period to enable them to capitalize on markets factoring in the effect of good news on financing cost. Hence, Myers contends that unless managers have some incentive, it is less likely that they choose the maturity structure that serves the best interests of the owners voluntarily. Under their prerogative, therefore, managers are least likely to choose maturity structure that exposes them to the undesirably more rigorous and frequent inspection of the debt markets. The inherent managerial preference of self-serving managers for minimum monitoring thus might lead to suboptimal choice for debt maturity structure within the firm against the interest of shareholders (Datta, Iskandar Datta Mal., & Raman, 2005).

Debt maturity structure and managerial behaviour According to finance literature, the conflict between managers and owners arise due to the level of leverage and duration of leverage. It is a well-known fact that along with capital structure or debt, managers also manipulate the debt maturity structure or maturity choice by controlling the timing of maturity of the debt. The managers use debt maturity as a tool for their self- interest, despite they are assumed to make optimal financing choices to maximize the value of the firm and owners. Nevertheless, managers may not choose the value-maximizing debt maturity voluntarily unless they are offered some incentives to align with the interests of owners. Conspicuously, at their discretion managers create agency problem. As a result, choice of debt and its maturity are themselves subject to potential agency costs (Datta et al. 2005, Berger, 2005).

In financing decisions, therefore, managers have the discretion not only to determine the debt level in the capital structure but also to choose the duration of borrowing. The self- interested managers with lower or no equity ownership avoid external pressure by debt markets arising from frequent monitoring and thus prefer to issue long-maturity debt. Frequent monitoring occurs when managers issue short-term debt. Shorter maturities help shareholders monitor the management more efficiently and effectively and hence saves the firm a good deal in monitoring costs (R. Rajan & Winton, 1995).

Increased managerial ownership helps align the interests of owners and managers and mitigate agency problem. The higher level of the interest matching decreases the agency cost generating from long-term debt and less monitoring by self- interested managers. For this reason, the equity ownership provides an incentive to the managers to choose debt maturity that can provide frequent monitoring (Datta et al 2005). Hence, short-term maturity has lower agency-related costs than longer maturity thus can be used as a highly effective tool to monitor management (Stulz, 2000). Researchers believe that one of the important outcomes of borrowing for a short term is its effectiveness in building systematically repetitive monitoring mechanism that puts management's interest well aligned with those of shareholders'. So the debt maturity structure has a direct link with monitoring frequency of the firm by the underwriters, investment bankers, investors, and lending institutions. In this scenario, shorter maturity forces firms to interact with debt markets frequently, which tighten the monitoring process by the credit rating agencies, lending institutions, and capital markets.

Under their prerogative, therefore, managers are least likely to choose maturity structure that exposes them to the undesirably more rigorous and frequent inspection of the debt markets. The inherent managerial preference of self-serving managers for minimum monitoring thus deviate from value-maximizing debt and might lead to suboptimal choice for debt maturity structure within the firm against the interest of shareholders. Therefore, managers tend to issue long-term debt rather short term. Authors argue that the conflict over the debt maturity structure arises between owners and managers due to their inherent preference of self- interest to be monitored less (Datta, et al 2005). Given the fact that management decides most of the times about funds and maturity structure of financing, only the management with their interests strongly linked with the interest of owners would prefer short-term debt. However, in most of the cases, self-serving managers having misaligned interests would entrench themselves by borrowing longer-term to retain their autonomy and avoid frequent monitoring. On the other hand, Myers (1977) argue that managers with some positive news not yet publicized might borrow for a shorter period to enable them to capitalize on markets factoring in the effect of good news on financing cost. Hence, Myers contends that unless managers have some incentive, it is less likely that they choose the maturity structure that serves the best interests of the owners voluntarily.

Giving the evidence of managerial self- serving behaviour, Datta et al (2005) found that managerial ownership is inversely related to debt maturity indicating that with the increase of ownership proportion managers align their interests with shareholders and issue big proportion of short-term debt and vice versa. According to Diamond's (1991) liquidity risk has a direct relation with debt maturity; therefore, debt maturity increases with the liquidity risk. So the same outcome is drawn by Datta et al (2005) who claim that managers with lower ownership choose longer maturity debt even when liquidation risk is low confirming the relationship between liquidity risk and the choice of debt maturity. Other studies also capture the managerial self-serving element such as Guedes and Opler (1996) document that good investment grade firm borrows short-term debt. They maintain that the firm managers issue long-term debt probably to avoid the costly liquidation risk. Similarly, growth firms tend to avail short- term debt while the large firms with lower credit ratings prefer longer-term debt (Barclay and Smith 1995). To see the fact managers in high-quality firms issue short-term debt and managers in low-quality firms borrow long-term debt (Kale and Noe 1990). García-Teruel & Martínez-Solano, (2010) maintain that managerial ownership and the long term debt

have a positive relationship between each other at the low level of managerial ownership and at a high level of managerial ownership, it is negatively related. They conclude that when firms are smaller and burdened with more debt, they prefer long term debt. Additionally, the authors elaborate that firms usually do not consider tax effects while making decisions about debt maturity but try to avoid term premium on the interest rates.

Some studies on Shariah-Compliant - firms In the literature, capital structure is studied at a greater extent for conventional firms as compared to the Shariah firms. However, recently the volume of research has increased from the Islamic perspective. Despite that the considering specific area of agency theory or principal-agent relation, the research in the area of corporate finance (i.e. ownership structure and capital structure in the non-financial sector is scant (Ahmed, 2007; Gunn, 2014). Some studies that focus on the shariah-compliant concept can be reviewed as under.

Haron and Ibrahim (2012) investigate the target capital structure, the speed of adjustment and the Determinants of target capital structure of Shariah-compliant firms in Malaysia. Hassan, Shafi, and Mohamed (2012) found that Shariah-compliant companies' debt ratio investigation suggests that both Shariah-compliant and conventional firms have different factors to be considered in deciding the capital structure. Moreover, Shariah-compliant firm's agency issue is studied mostly in the Islamic banking sector by different authors such as Archer, Karim, and Al-Deehani (1998), Sarker (1999), Aggarwal and Yousef (2000), Chapra and Ahmed (2002), Grais and Pellegrini (2006), (Hagendorff, Collins, & Keasey, 2007), Safieddine (2009), Aljifri and Kumar Khandelwal (2013) and others.

The other studies on the Islamic area are done by Pratomo and Ismail (2006). Aljifri and Kumar Khandelwal (2013), Gunn and Shackman (2014) study on Similarly, Baxamusa and Jalal (2014) study the effect of religion on capital structure. In another study on managerial deceptiveness through earnings management, Farooq, AbdelBari, and Haniffa (2015), Farooq and Tbeur (2013) Omran and Pointon (2004) and Skinner and Soltes (2011), Sadeghi (2011), Othman, Thani, and Ghani (2009), Ousama and Fatima (2010) Kiliç, Merve et al (2014) Zainal, Zulkifli, and Saleh (2013) and Katper et al., 2015; 2017; 2018) studied different areas and concepts for Shariah-compliant firms such as capital structure, debt maturity structure, ownership structure, managerial behaviour and trustworthiness, role of manager and firm performance. Hence, in the literature, despite the good number of studies on shariah globally there is no such study on the sector-wise analysis for Shariah-compliant along with conventional business concept in this area.

3. Methodology In this research, the quantitative empirical study is conducted for analyzing the various sectors of Pakistan. The data were collected from Pakistan stock exchange as a secondary source. This research is based on the two different samples from Shariah-compliant firms and non-Shariah-compliant firms according to the availability of information.

Sample: The sample is based on Shariah-compliant and conventional firms listed on Pakistan Stock Exchange, for five years from 2013. Two regressions are estimated for all firms and conventional firms.

Hypothesis development

A. H0: There is no difference in the determinants of debt maturity structure in the sectors of Shariah-compliant and conventional firms of Pakistan

H1: There is a difference in the determinants of debt maturity structure in the sectors of Shariah-compliant and conventional firms of Pakistan

B. H0: There is no difference in the managerial behaviour for deciding debt maturity structure in the sectors of Shariah-compliant and conventional firms of Pakistan

H1: There is a difference in the managerial behaviour for deciding debt maturity structure in the sectors of Shariah-compliant and conventional firms of Pakistan

Model and variable explanation

A. Objective 1: Sector-wise analysis is made for determinants of debt maturity structure in the Shariah-compliant and conventional firms. Model one is used for the measurement of the 1st objective of the study in the sectors given the next section.

Model 1: $DEMAT_{it} = \beta_o + \beta 1\ Size_{it} + \beta_2 Growth_{it} + \beta_3\ Asset\ Maturity_{it} + \beta_4\ Operating\ Cycle_{it} + \beta_5 Tangibility_{it} + \beta_6\ Profitability_{it} + \beta_7 Risk_{it} + \beta_8\ Tax\ rate_{it} + \beta_9 NDTS_{it} + \varepsilon_{it}$

Variables defined:

DEMAT is debt maturity which represents the long term debt in the firm

Size is the total assets of the firm's assets.

Growth is sales growth each year.

Asset maturity is the ratio of net fixed assets over depreciation.

Tangibility is the ratio of net property plant and equipment to total assets.

Profitability is earnings before interest and taxes by total assets.

The risk is the standard deviation of the firm's return on assets over 5 years.

The tax rate is the effective tax rate for the firm worked out as the ratio of the tax bill and taxable income.

NDTS is non-debt tax shield which is a ratio of depreciation to total assets.

***B. Objective 2*:** The second objective is probing trustworthiness in the managerial behaviour while deciding debt maturity structures in the sectors of Shariah-compliant and conventional business.

Model 2: $DEMAT_{it} = \beta_o + \beta_1\ Managerial\ Ownership_{it} + \beta_2\ Size_{it} + \beta_3\ Growth_{it} + \beta_4\ Asset\ Maturity_{it} + \beta_5\ Operating\ Cycle_{it} + \beta_6\ Tangibility_{it} + \beta_7\ Profitability_{it} + \beta_8\ Risk_{it} + \beta_9\ Tax\ Rate_{it} + \beta_{10}\ Non\text{-}Debt\ Tax\ Shield_{it} + \varepsilon_{it}$

Variables defined:

DEMAT is debt maturity which represents the long term debt in the firm

Managerial Ownership is a fraction of managerial ownership in firm i equity, Size is the natural log of total assets

Size is the total assets of the firm's assets.

Growth is sales growth each year.

Asset maturity is the ratio of net fixed assets over depreciation.

Tangibility is the ratio of net property plant and equipment to total assets.

Profitability is earnings before interest and taxes by total assets.

The risk is the standard deviation of the firm's return on assets for 5-years.

The tax rate is the effective tax rate for the firm worked out as the ratio of the tax bill and taxable income.

NDTS that is tax shield in non-debt tax saving is a ratio of depreciation to total assets.

Technique: For this sector-wise analysis, we apply OLS regression as well as a fixed effect and random effect approach to compare the similarities and dissimilarities among Shariah-compliant and non-shariah firms sector-wise.

4. Sector-wise analysis and discussion The sector-wise analysis for objective 1 by using model one is given below

Model 1: $DEMAT_{it} = \beta_o + \beta 1\ Size_{it} + \beta_2 Growth_{it} + \beta_3\ Asset\ Maturity_{it} + \beta_4\ Operating\ Cycle_{it} + \beta_5 Tangibility_{it} + \beta_6\ Profitability_{it} + \beta_7 Risk_{it} + \beta_8\ Tax\ rate_{it} + \beta_9 NDTS_{it} + \varepsilon_{it}$

Shariah-compliant firms (Chemical) According to the fixed effects model, Shariah-compliant firms, in the chemical sector the size is negatively and significantly related to the dependent variable debt maturity. This also shows large firms tend to issue short-term debt. The growth shows inverse relation to debt maturity but insignificant in this sector. Similarly, assets maturity, operating cycle, tangibility, profitability, risk, tax rate and non-debt tax shield are insignificant and pose no relation with dependent variable debt maturity in the chemical sector.

Shariah-compliant firms (Miscellaneous) There is a positive and significant relation between size and debt maturity in Shariah-compliant firms for the miscellaneous sector. According to agency theory, the agency cost is higher for small firms. Moreover, the control on these costs can be possible with the help of short-term financing. This predicts that there should be a positive relationship between debt maturity structure and size of the firm. Similarly, the positive relationship is suggested by the hypothesis of information asymmetry. Moreover, the access of smaller firms to capital market becomes difficult due to fix flotation costs of long-term securities this also suggests a positive relationship between the size and debt maturity structure of the firm. The result is consistent across various studies in the literature (Barclay and Smith, 1995; Guedes and Opler 1996; Stohs et al. 1996; Cai et al. 2008). The findings report that the size is a significant factor in deciding debt maturity as larger firms tend to issue longer-term debt. However, growth, asset maturity, profitability and tax rate are negative and insignificant. While the operating cycle and non-debt tax shield are positive but insignificant. Conversely, tangibility is positively and significantly correlated with the debt maturity in the two Shariah-compliant and conventional samples. This result is consistent with Krich et al. (2012). Also, the risk is positive and significant in Shariah-compliant sample performing a substantial relationship with the dependent variable debt maturity consistent with (Krich et al. 2012).

Conventional firms (Miscellaneous) The fixed-effects model suggests that size, growth, asset maturity, operating cycle, tax rate and non-debt tax shield are insignificant in the conventional firms of the miscellaneous sector. However, tangibility is positively and significantly related to the dependent variable 'debt maturity' indicating that more tangible firms avail longer-term debt. The findings are consistent with Krich et al. (2012).

Profitability is also positively and significantly related to the debt maturity showing that conventional profitable firms in the miscellaneous sector prefer longer-term debt. The results are consistent with Deesomsak et al. (2009), they argue that positive relationship specifies that profitable firms have higher taxable income, and thus receive greater tax benefits from long-term debt. The risk is negatively and significantly related to debt maturity. This result is also consistent with (Guedes and Opler (1996) and Stohs & Maur (1996).

Shariah-compliant firms (Oil & Gas) The size and growth in Shariah-compliant firms of the oil & gas sector have an insignificant relationship with the debt maturity. The result is alike to that of Shariah-compliant companies in the automobile sector. However, asset maturity, operating cycle, profitability, risk, and NDTS are negatively related to the dependent variable. It is important to note that, the tangibility and tax rate are indifferent to the debt maturity in this sector.

Shariah-compliant firms (Cement) Size is positively but insignificantly related to the

dependent variable in Shariah-compliant firms of the cement sector. As well, asset maturity, operating cycle and risk are negative but insignificant in the Shariah-compliant firms of the cement sector. While the profitability, tax rate, and NDTS are positive and insignificant in this sector. Growth has also positive and insignificant relation with dependent variable debt maturity. The findings of the study are comparable to the findings various studies (Billett et al., 2007; Kim et al., 1995; Stohs and Mauer, 1996; Cai et al., 1999 and Hart & Moore 1995). They mentioned that firms tend to use long-term debt to control managers' incentives in investing for negative NPV projects.

Find Table: 1 and 2 as annexure.

Shariah-Compliant Firms (Automobile) Fixed effect illustrates that in the Shariah-compliant firms of the automobile sector, the size, asset maturity, operating cycle, profitability, risk, and NDTS are insignificant having no relation to debt maturity in this sector. Similarly, the growth variable is negative but insignificant. Parallel to the findings, Diamond's (1991) predicts that growth opportunities are insignificantly or positively related to debt maturity. Profitability is also indifferent in this sector of Automobile.

Conventional firms (Sugar) The conventional firms in the sugar sector show a positive and significant relationship with debt maturity. Growth is positive and significantly correlated showing its importance in the choice of corporate debt maturity. The debt maturity increases with growth opportunity of the firm suggesting a positive relationship as growing firms use long-term debt. The result of the sugar sector finds a positive and significant relationship between asset maturity and debt maturity structure. It provides evidence that firms with long-term asset maturity tend to have long-term debt. Thus the results for our sample of conventional firms are consistent with the number of studies[1]. The sugar sector also shows that profitability is insignificant having no relation with debt maturity consistent with the findings of Krich et al. (2012). Likewise, the tangibility is positively and significantly correlated with the debt maturity in the conventional firms of the sugar sector also consistent with Krich et al. (2012).

In the case of risk, in conventional firms of this sector, the results are parallel to the overall conventional sample. The finding is positive but insignificant suggesting no relationship between risk and debt maturity structure. Also, the tax rate is positive but insignificant in conventional firms in this sector. The result is similar to the results of the overall conventional firm sample suggesting that tax rate has no relation with the dependent variable 'debt maturity'. The results are consistent with the findings of Korner (2007).

Conventional firms (Textile) In the conventional firms of the textile sector size, asset maturity, risk, tax rate and non-debt tax shield are insignificant showing no effect on debt maturity. However, the operating cycle and tangibility exert a negative and significant effect on debt maturity. The growth has a positive but insignificant relationship with the dependent variable. This indifferent behaviour of growth for debt maturity decision is also documented by various authors[2] consistent with Hart and Moore's (1995). They argue on overinvestment that firms tend to use long-term debt to control managers' incentives to invest in negative

[1] (Myres (1977); Stohs and Mauer (1996); Korner (2007); Khemaies (2010); Shah and Khan (2009); Cai et al. (2008); Guedes and Opler, (1996); and Antoniou et al., (2006)).

[2] Billett et al (2007), Kim et al (1995) and Stohs and Mauer (1996) for US firms and by Cai et al, (1999) for Japanese companies.

NPV projects. It may be that the underinvestment problem is of less concern for the firms in our sample than overinvestment inefficiencies.

However, the operating cycle is negative and significantly related to debt maturity. It is argued that a high ratio of an operating cycle will show that the firm may need short-term financing to support sales because this variable is measured as the ratio of sales to fixed assets (Demirguc-Kunt and Maksimovic 1999). Tangibility is negatively and significantly associated with the debt maturity in conventional firms of textile sector converse to the conventional firms studied by (Katper et al,2017) thus the variable is behaving differently in sector analysis. It shows that in the textile sector conventional firms avail longer-term debts on relatively lesser fixed assets. They may avail insecure long-term financing and do not use much collateral for long-term borrowing. Profitability has a positive and significant relation with debt maturity converse to results of (Katper et al, 2017) but similar to conventional firms in the miscellaneous sector and equivalent to (Deesomsak et al. 2009).

Sector-wise analysis for managerial behaviour in the debt maturity structure of conventional and Shariah firms

This section describes the sector-wise analysis for objective two by model 2. The dependent variable in this objective is 'debt maturity structure' and the main explanatory variable is 'managerial ownership' (ownership structure). The model is run to explore the element of self-interest (or trustworthiness) in the behaviour of managers in Shariah-compliant and conventional firms for debt maturity structures among various sectors through the following method.

Objective 2 managerial behaviour and debt maturity

$$\textit{Model 2: } DEMAT_{it} = \beta_o + \beta_1\, Managerial\ Ownership_{it} + \beta_2\, Size_{it} + \beta_3\, Growth_{it} + \beta_4\, Asset\ Maturity_{it} + \beta_5\, Operating\ Cycle_{it} + \beta_6\, Tangibility_{it} + \beta_7\, Profitability_{it} + \beta_8\, Risk_{it} + \beta_9\, Tax\ Rate_{it} + \beta_{10}\, Non\text{-}Debt\ Tax\ Shield_{it} + \varepsilon_{it}$$

The following sectors are analysed according to the availability of the secondary data on the Pakistan Stock Exchange.

Shariah-compliant firms (Chemical) The model of this objective, through a fixed effect approach excitingly tests that managerial ownership in Shariah-compliant firms of the chemical sector has no relationship with the dependent variable 'debt maturity'. The results are consistent with the study of (Katper et al, 2017). Thus the hypothesis of this study is proved corresponding to the results of their research in 2017. The managers do not exert any effect on long and short term debt maturity for their interests. Therefore, they may be said as trustworthy. Size also behaves the same as in the study of (katper et al, 2017) in their sample of Shariah-compliant firms.

Shariah-compliant Firms (Miscellaneous) In Shariah-compliant firms of the miscellaneous sector, according to fixed effect, the managerial ownership is positively and significantly related to the dependent variable debt maturity. It shows that the managers of Shariah-compliant firms in this sector may exert influence on the debt maturity structure. Moreover, they may decide longer or shorter maturity for the debt in the capital structure. Longer-term maturity may be preferred when the proportion of managerial ownership increases. Hence, the results in this sector are different from the findings of Katper**,** N. K., Madun, A., & Syed, K. B. S. Tunio, M.N. (2017) Shariah-compliant firm sample questioning the trustworthiness in the managerial behaviour.

Conventional firms (Miscellaneous) For the conventional firms of the miscellaneous sector,

the random effect approach establishes that the managerial ownership variable is positive and significant. It shows that with the increasing proportion of the shares of managers, the debt maturity also elongates. It indicates that the managerial ownership influences the decision-making according to their motives as hypothesized. The results are similar to the previous study by Katper**,** N. K., Madun, A., & Syed, K. B. S. Tunio, M.N. (2017) conventional firms' findings. Therefore, it is consistent with their opinion and proves our projection/hypothesis.

Shariah-compliant firms (Automobile) For Shariah-compliant firms in the automobile sector, the random effect inaugurates that explanatory variable is insignificant. This result is also consistent with the results of our above-mentioned sample of Shariah-compliant firms in various sectors. The findings prove our hypothesis true about Shariah-compliant companies. It indicates that in the automobile sector, managers in Shariah-compliant firms do no exploit the debt maturity structure by making a variation in the debt maturity level with the change in owner equity proportion. Therefore, the ownership structure is indifferent with the debt maturity duration showing the trustworthy behaviour of managers of Shariah-compliant firms.

Shariah-compliant firms (Oil & Gas) The fixed effect indicates that result regarding managerial ownership in Shariah-compliant sector of the oil & gas sector is converse to the results of previous studies on an individual sample of Shariah-compliant firms. The finding of this sector shows that managerial ownership is positive and significant that may exert an effect on the debt maturity in the capital structure. Thus, with the increasing ownership, the managers influence on the debt maturity choice. Moreover, due to the positive relationship, it may be inferred that firm managers may avail debt with longer debt maturity by increasing their ownership proportion and vice versa according to their objectives.

Shariah-compliant firms (Cement sector) The random-effect model for the Shariah-compliant firms of the cement sector shows that the main explanatory variable is insignificant demonstrating no influence of managerial ownership on the debt maturity structure of these firms. It means the decision about availing longer-term debt or shorter-term debt is not prejudiced by the change in the managerial ownership structure of the firms. The debt maturity structure is independent of the managerial self- interest behaviour.

Conventional firms (Sugar sector) Similar to the previous study sample of conventional firms, the results of the conventional firms of the sugar sector show that the managerial ownership variable is significant according to the fixed model. This also justifies our hypothesis and results are consistent with our regression tests and other robust tests to prove the validity of the argument. This result shows that the managers with a variation of their ownership in conventional firms influence the choice of debt maturity structure according to their self-interests.

Conventional firms (Textile) According to the random effect, the main explanatory variable 'managerial ownership' in the conventional firms of textile sector is significant. The variable has a positive relationship with a dependent variable, so it seems that managers exert influence in the choice of debt maturity structure. As their ownership increases, they choose the longer-term debt maturity structure and avail the long term debt more than shorter-term debt. They may decide according to their interests, thus proving our hypothesis true.

5. Conclusion

The sector-wise analysis assesses the differences and similarities of the individual sector. For the sectors of both Shariah-compliant and conventional firms, the research found that there are some similarities and differences.

Sector-wise analysis for the determinants of debt maturity

For the shariah-compliant **chemical sector, size is** negatively and significantly related with the dependent variable debt maturity implying that larger the firm, lower the long term debt financing. Conversely, positive and significant relation between size and debt maturity in Shariah-compliant firms for the **miscellaneous sector, while** size, growth, asset maturity, operating cycle, tax rate and non-debt tax shield are insignificant in the **conventional miscellaneous sector.** However, tangibility is positively and significantly related to the dependent variable 'debt maturity' indicating that more tangible firms avail longer-term debt. **Profitability** is also positively and significantly related to the debt maturity showing that conventional profitable firms in the miscellaneous sector prefer longer-term debt. The findings report that the size is a significant factor in deciding debt maturity as larger firms tend to issue longer-term debt consistent with agency theory. Risk is positive and significant in Shariah-compliant chemical sector. The **conventional firms in the sugar sector** show a positive and significant relationship of growth with debt maturity. The debt maturity increases with growth opportunity of the firm suggesting a positive relationship as growing firms use long-term debt. Tangibility is positively and significantly correlated with the debt maturity in the conventional firms of the sugar sector. In the **conventional firms of the textile sector** size, asset maturity, risk, tax rate and non-debt tax shield are insignificant showing no effect on debt maturity.

Sector-wise analysis for managerial self-interest and debt Maturity

In objective two of the study, the dependent variable is 'debt maturity structure' and the main explanatory variable is 'managerial ownership'. Managerial ownership for **Shariah-compliant firms of the chemical sector, the automobile sector and Cement sector** shows no relationship with the dependent variable 'debt maturity'. The results are consistent with the study of (Katper et al, 2017) and the managers do not exert any effect on long and short term debt maturity for their interests. Therefore, they may be said as trustworthy. In the **miscellaneous Shariah-compliant and conventional** and Shariah **OIL & Gas** sectors, and **conventional textile sector and conventional Sugar sector** the managerial ownership is positively and significantly related to the dependent variable debt maturity. It shows that the managers of Shariah-compliant, as well as conventional sectors of mentioned sectors, may exert influence on the debt maturity structure. Moreover, they may decide longer or shorter maturity for the debt in the capital structure. Longer-term maturity may be preferred when the proportion of managerial ownership increases showing different behaviour than previous studies. It shows that with the increasing proportion of the shares of managers, the debt maturity also elongates. Thus, with the increasing ownership, the managers influence on the debt maturity choice. Conclusively, the findings show that most of the conventional sectors' managers may prefer self-interest. However, most of the Shariah-compliant sectors' managers do not influence and avoid their self-interest.

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Table 1: Sector-wise analysis for determinants of debt maturity structure in the Shariah-compliant and conventional firms

Model 1: $DEMAT_{it} = \beta_o + \beta 1\ Size_{it} + \beta_2 Growth_{it} + \beta_3\ Asset\ Maturity_{it} + \beta_4\ Operating\ Cycle_{it} + \beta_5 Tangibility_{it} + \beta_6\ Profitability_{it} + \beta_7 Risk_{it} + \beta_8\ Tax\ rate_{it} + \beta_9 NDTS_{it} + \varepsilon_{it}$

Variables defined: Size is the total assets of the firm's assets. Growth is sales growth each year. Asset maturity is the ratio of Net fixed assets over depreciation. The tax rate is the effective tax rate for the firm worked out as the ratio of the tax bill and taxable income. Profitability is earnings before interest and taxes by total assets. The risk is the standard deviation of the firm's return on assets over a 5-year period. Tax shield in non-debt tax saving as a ratio of depreciation to total assets. Tangibility is the ratio of net property plant and equipment to total assets.

Sector	SIZE	GROW	Assetmat	OPCYCL	TANG	PROFIT	RISK	Tax rate	NDTS	C	R-squared	Hausman
Chemical	-0.555***	-0.000	0.015	-0.001	-0.177	-0.009	-0.009	0.114	-4.926	9.439***	0.984	(F.E) 94.917***
	(-8.051)	(-0.891)	(1.179	(-0.081)	(-0.424)	(-1.129)	(-1.288)	(1.586)	(-1.156)	(8.205)		(0.000)
Miscell (SH)	0.039**	-0.000	-0.000	0.0003	0.444***	-0.003	0.012***	-0.0004	0.082	-0.546**	0.3023	(R.E) 15.646*
	(2.446)	(-0.210)	(-0.222)	(0.344)	(3.807)	(-1.306)	(3.535)	(-0.194)	(0.312)	(-2.252)		(0.074)
Miscell C	0.065	0.000	0.000	0.000	0.471***	0.011***	-0.014**	-0.000	0.115	-0.921	0.811	29.485***
	(1.032)	(0.538)	(-0.285)	(0.320)	(3.375)	(3.414)	(-2.615)	(-0.480)	(1.501)	(-0.959)		(0.000)
Oil & gas (SH)	0.106	-0.002	-0.007**	-0.0263**	-0.525	-0.028**	-0.038**	-0.000	-6.925*	0.039	0.994	(F.E)302.95***
	(0.612)	(-1.901)	(-2.616)	(-3.305)	(-0.634)	(-4.707)	(-3.755)	(-1.701)	(-2.016)	(0.013)		(0.000)
Cement (SH)	-6.530	0.012	-0.166	-18.03	-103.910**	0.082	-0.853	1.482	536.170	189.572	0.221	(R.E) 9.163
	(-0.790)	(0.391)	(-0.197)	(-1.293)	(-2.633)	(0.099)	(-0.692)	(0.084)	(1.308)	(1.138)		(0.422)
Automob (SH)	0.010	-0.000	-0.000	-0.000	0.278***	-0.000	0.001	-0.011*	-0.167	-0.168	0.993	(F.E)14.913**
	(0.844)	(-1.457)	(-0.882)	(-0.820)	(4.662)	(-0.862)	(1.606)	(-1.980)	(-0.674)	(-0.838)		(0.037)
Sugar C	0.119	0.001**	-0.002	0.001	0.295**	0.003	0.012	0.068	0.002	-1.740	0.797	(F.E)57.699***
	(1.310)	(2.900)	(-0.965	(0.276)	(2.594)	(0.585)	(1.438)	(0.736)	(0.741)	(-1.242)		(0.000)
Textile C	-0.034	0.000	0.000	-0.047***	0.330**	0.008**	0.005	-0.000	0.177	1.085	0.837	(F.E)19.074**
	(-0.761)	(0.543)	(1.4196)	(-3.872)	(-2.275)	(2.268)	(1.646)	(-0.080)	(1.620)	(1.601)		(0.024)

Note: SH= Shariah-Compliant, C= Conventional, F.E= Fixed effect is selected, R.E= Random effect is sele

Table 2: Sector-wise analyses for the managerial behaviour in the debt maturity structure of conventional and Shariah-compliant firms

Objective 2 : Model 2: $DEMAT_{it} = \beta_o + \beta_1 Managerial\ Ownership_{it} + \beta_2 Size_{it} + \beta_3 Growth_{it} + \beta_4 Asset\ Maturity_{it} + \beta_5 Operating\ Cycle_{it} + \beta_6 Tangibility_{it} + \beta_7 Profitability_{it} + \beta_8 Risk_{it} + \beta_9 Tax\ Rate_{it} + \beta_{10} Non\text{-}Debt\ Tax\ Shield_{it} + \varepsilon_{it}$

Variables defined: DEMAT is debt maturity which represents the long term debt in the firm. Managerial Ownership is a fraction of managerial ownership in firm i equity, Size is the natural log of total assets. Size is the total assets of the firm's assets. Growth is sales growth each year. Asset maturity is the ratio of net fixed assets over depreciation. Tangibility is the ratio of net property plant and equipment to total assets. Profitability is earnings before interest and taxes by total assets. The risk is the standard deviation of the firm's return on assets over a 5-year period. The tax rate is the effective tax rate for the firm worked out as the ratio of the tax bill and taxable income. NDTS that is tax shield in non-debt tax saving is a ratio of depreciation to total assets.

Sector	**MO**	**SIZE**	**GROW**	**Asset mat**	**OPCYCL**	**TANG**	**PROFIT**	**RISK**	**Tax rate**	**NDTS**	**C**	**R square**	**Hausman**
Chemical	-0.000	-0.56***	-0.000	0.016	0.000	-0.157	-0.010	-0.008	0.118	-5.196	9.515***	0.984	82.129***
	(-0.381)	(-7.696)	(-0.875)	(1.163)	(0.041)	(-0.359)	(-1.148)	(-1.108)	(1.569)	(-1.161)	(7.862)		(0.000)
Miscell (SH)	0.003**	0.033	0.000	0.000	0.001	0.639***	0.003	0.003	-0.000	-0.145	-0.600	0.849	20.707**
	(2.286)	(0.644)	(0.248)	(0.373)	(1.083)	(3.662)	(0.968)	(0.684)	(-0.116)	(-0.520)	(-0.764)		(0.023)
Miscell (NS)	0.004***	0.077**	0.000	0.001	-0.005	0.282	0.000	0.000	-0.001	0.134	-1.124**	(0.2783	12.444
	(3.088)	(2.357)	(1.333)	(1.083)	(-1.257)	(1.179)	(0.221)	(0.108)	(-0.546)	(0.650)	(-2.272)		(0.256)
Oil and gas	0.016*	0.093	-0.001	-0.007**	-0.023**	-0.431	-0.031***	-0.037	-0.000*	-4.653	0.089	0.997	193.024***
	(2.579)	(0.781)	(-1.775)	(-3.578)	(-4.281)	(-0.759)	(-7.294)	(-5.352)	(-2.085)	(-1.852)	(0.043)		(0.000)
Cement	0.022	6.440	0.011	-0.200	-18.181	-104.12**	0.082	-0.842	1.755	539.04	188.55	0.221	10.080
	(0.105)	(-0.765)	(0.372)	(-0.219)	(-1.281)	(-2.604)	(0.098)	(-0.673)	(0.098)	(1.297)	(1.116)		(0.433)
Automobile	0.000	0.000	0.000	-0.000	----	0.331***	0.001	0.001	---	0.116	-0.053	0.432	13.304
	(0.104)	(0.040)	(0.355)	(-1.162)		(4.734)	(1.447)	(0.683)		(0.246)	(-0.218)		(0.101)
Sugar (NS)	0.009***	0.053	0.001***	-0.001	0.005	0.224*	0.005	0.014	0.009	0.002	-1.057	0.8423	19.661**
	(6.081)	(0.549)	(3.079)	(-0.520)	(0.738)	(1.860)	(0.815)	(1.628)	(0.099)	(0.739)	(-0.715)		(0.003)
Textile (NS)	0.004**	0.056	-0.000	0.000	-0.070	0.641	0.019*	0.000	0.003	-0.150	-0.786	0.149	4.117
	(2.175)	(1.072)	(-0.514)	(0.292)	(-1.611)	(1.344)	(1.874)	(0.011)	(0.090)	(-0.388)	(-0.775)		(0.941)

Note: SH= Shariah-Compliant, C= Conventional, F.E= Fixed effect is selected, R.E= Random effect is selected.