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Peer Effects on Capital Structure Decisions: Empirical Evidence from Selected Listed Companies of DSE

Abstract

In the dynamic landscape of corporate finance, the effect of social dynamics on decision-making processes is a subject that deserves closer examination. This study attempts to capture effects of peer firms on capital structure decisions on listed firms of DSE from Food and Allied, Power and Fuel, Cement and Ceramic sectors during 2014-15 to 2021-22. We have used industry median leverage to measure peer firm's capital structure decision. Results of Fixed effects model using a panel of 280 firm-year data suggest absence of peers' effects on capital structure decisions of firm. The key variable of interest - industry median Total Debt ratio (TDR), Short term debt ratio (STDR) and long term debt ratio (LTDR) ratio have positive but statistically insignificant effects on firm's TDR, STDR and LTDR respectively. Consequently, this study rejects the peers' influence on capital structure decisions, concluding that capital structure is independent of peer dynamics. The finding further reveals cash generating efficiency and liquidity to be negatively associated with leverage. Asset growth rate exhibits significant positive association with leverage. Firms possessing more tangible assets prefer long term debt. Debt servicing capacity has significant positive effects on STDR. Total assets growth rate is positively associated with debt. The findings suggest that Bangladeshi managers emphasize on firm-specific aspects when making capital structure decisions. They should prioritize the firm's strengths, opportunities, risks, weaknesses, conditions, and strategy over peer decisions.

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1. Introduction

Debt financing decisions of firms involve receiving cash in advance in exchange of allocating a portion of future cash flows off the equity holders. As every firm desires to have an optimal balance between debt and equity, in corporate finance, one of the most discussed areas is optimal capital structure both theoretically and empirically. The capital structure Policy is a key to maximize the shareholders' value, risk allocation and the control of the firm.

An appropriate capital structure promotes performance of the individual firm, facilitates the sustainability of the firm and finally, expedites the accomplishment of strategic goals. Many theories have been suggested such as Relevancy of capital structure, Agency theory of Capital structure, Pecking order theory choosing sources of fund, Market timing theory etc. Modigliani and Miller (1958) presented argument on the relevance of capital structure to firm value. There are existence of the cost of financial distress and bankruptcy. After considering these two costs, Scott (1977) suggested optimal capital structure can be found by interchanging the gain from tax shield and related financial distress costs of using debt financing. However, till now,

no certain rules or theory suggests the firm exactly what is the appropriate level of leverage in their capital structure. As a result, managers attempt in several ways to approach the optimal debt-equity ratio.

If we consider the existing researches, both empirical and theoretical, in the area of corporate financing or capital structure decisions, we find that the researchers have assumed the financing decisions independent of their peers. It means that firms decide on their financing issues based on their needs, tax rate, incentives and other firm specific factors. As a result, in most of the cases, the influence of peer firms on financing decisions has remained ignored.

However, recent studies show the evidence of peer effects on corporate financial decisions making. Survey revealed that the CFO of firms considered peer firms as an important factor for deciding own capital structure (Graham and Harvey, 2001). Later on, an empirical study of Frank and Goyal (2009) revealed the median debt ratio of the industry as an essential factor that determines the firm's capital structure. Following that, Leary and Roberts (2014) extended their study to identify policy interdependence from industry leverage effect. They also indicated that firms, which are smaller, non-rated, and non-dividend paying, as well as financially constrained and led by less experienced and lower-paid managers, are expected to emulate their more established industry counterparts. Thus, peer effects arise from the desire for learning and the motivation to establish a reputation in the field, organization, or industry. After the initial attempts to address peer effects on individual firms, Popadak (2013) analyzed the dividend changing event and concluded that managers change the level (amount) and timing of dividend payment of their firm based on that of their industry peer firms. Also, evidence of peer effects have been found in the area of corporate social responsibility (CSR) activities, Investment decisions, Cash holding decisions, dividend payout policy etc.

Due to the lack of harmony in findings of capital structure determinants around the world, researchers feel the necessity of empirical analysis in the context of specific institutional settings or country (Lima, 2010). Furthermore, managerial model that are developed in western countries guides to poor business decisions when applied in different institutional context (Lagoarde-Segot, 2013). Hence, it is necessary to revisit the concept of peer effects on capital structure from the context of Bangladesh. Studies of capital structure (e.g., Chowdhury, 2004; Hossain and Hossain, 2015; Lima, 2010) have remained constrained to the firm specific factors and testing different theories in Bangladesh. To our best knowledge, impact of peer firms' decisions on capital structure remains untouched in the empirical studies on capital structure in Bangladesh. Compared to the established theories of capital structure, this novel phenomena has remained uninvestigated also in other least developed and developing countries. As a result, there is lack of evidence on whether the managers in Bangladesh consider the capital structure of their peer firms or firms of their industry while deciding and adjusting the capital structure of their own firms. If they do so, this decisions is no longer independent of peers and actions of peers will affect the firm. On the other hand, if the evidence doesn't support the presence of peer effects on capital structure, individual firms will not respond to their peers rather they will set

their own decisions considering the firms specific factors. To answer this question and provide empirical evidence, this study inspects the peer pressure effects on capital structure from the perspective of Food and Allied, Power and Fuel, Cement and Ceramic sectors in Bangladesh. The unique contribution of this paper is assessment of peer pressure impact on capital structure in Bangladesh and thus extending the existing analysis from firm specific factors to industry specific factor.

2. Industry Overview

Consumer goods industry is quite large and quickly growing in the country. By consumer goods, we mean those goods that will not be used for further productions. That means, goods that are ready to be consumed by the final consumer are consumer goods. FMCG segment of those consumer goods that are sold quickly at lower cost. There are 21 listed firms in this sector. Private consumption is directly linked to this sector. FMCG have a short life span. This category is known for its low margin characteristics. Products of this sector can be categorized as Food and beverage, personal care and health care. Power and Fuel Sector of Dhaka Stock Exchange (DSE) consists of power generating and distributing firms, fuel importers and distributors, gas distributors and some other firms. There are 23 listed firms in the DSE under this sector. Power sector is getting top priority for its role in the development of the country. At present, electricity production capacity is 26,550 MW while maximum production is 15,604 MW. Bangladesh is going to enter the nuclear power era through the Rooppur power plant. By 2041, it wants to have 60,000 MW production capacity with 40% based on clean sources.

Initiation of the ceramic industry in this country was in the 1960s. According to the industry analyst, there are around 70 manufacturers in the ceramic industry of Bangladesh who are fulfilling around 90% domestic demand. Three main categories of ceramic products are Tableware, sanitary ware and Tiles. Cement is one of the most demanded construction materials in this modern era. Since the development of civilization, different types of construction materials have been used by the people. Cement is used to bind the other ingredients like sand, brick and mortar. According to the fortune business insights, the global cement industry was USD 340 billion in 2022 which is likely to reach USD 481 billion in 2029.

3. Theoretical Discussion

Researchers have proposed various theories for understanding the mechanism behind the decisions of capital structure. One of the most renowned theories is the MM proposition on the relevance of capital structure. Modigliani and claimed in 1958 that in the absence of tax, cost of transaction and if individual investor can borrow at similar cost of firms, the firm value doesn't depend on the combination of debt and equity fund in capital structure. So, capital structure is not relevant. In 1963, they incorporated tax and argued that gain or benefits that arises from interest tax shield contributes to the firm value. Hence, the value of firm increases when debt is incorporated into capital structure. The findings suggest the firm to use a capital structure entirely composed of debt funds. The static trade off theory attempts to approach optimal debt level by balancing debt and equity. Maximization of firm value is feasible at optimal capital structure. Lower cost of borrowed funds

reduces overall cost of capital but increase the risk of the enterprises. Under this model, firm value is adjusted for tax benefits as well as for financial distress.

Agency theory emphasized on minimization of agency cost to achieve optimal capital structure (Jensen and Meckling, 1976). They suggest reducing of the cost due to agency conflicts by means of increasing managerial ownership in the firm or by enhancing the contribution of debt fund to control perquisites consumption of managers. Jensen (1986) asserted that managers, with an excess amount of free cash, are likely to invest those cash into matured or ill-advised projects which result in decrease of shareholders wealth. Managers are unlikely to limit the growth to optimal level. They utilize the funds to grow above the optimum level. Managers' compensation is positively linked to firm growth, hence there are incentives to grow the firm as much as possible. However, growth above the optimal level isn't expected by the shareholders of the firm. So, they try to minimize the conflicts**.** Myers and Majluf (1984) proposed a new model for sourcing fund under some assumptions. They asserted the absence of optimal capital structure. The manager of a firm follows a hierarchy of choice or preferences for collecting new fund contingent on the cost of fund from different sources. As internal sources have no cost of funds other than opportunity cost, managers prefer retain earnings to equity and debt issuance respectively. However, the dissimilarities among large public, private and small public firms need to be recognized (Frank and Goyal, 2009). Private firms depend on internally generated and retained funds and debt typically while large listed firms utilize corporate bonds and retained earnings where small public firms rely on equity issuance for raising capital. Choice of debt is subject to direct cost of transaction and cost of bankruptcy. Stated by Ross (1977), due to information asymmetry, managers adopt leverage as a means of signaling to the market regarding of superior performance in upcoming days which will result in higher cash flows to firms. Managers seek debt funding when they perceive the firm as undervalued and opt for equity funding in inverse conditions.

Researchers have used different terminology for peer pressure effects such as herd behavior, mimicking, social interaction etc. Studies that investigated causes of peer effects have suggested several theories on peer effects. Banerijee (1992) proposed Information-based theory to explain social learning, also known as herd behavior, using the concept of information cascade. An information cascade happens if someone obtains new knowledge from the acts of their predecessors to the extent that they reasonably imitate their peers while ignoring their private signal. In case of financial decisions, Information cascade arises because the managers don't know exactly how to formulate optimal capital structure, the procedure of setting up optimal capital structure is uncertain, costly and time consuming. Thus, to decide on debt-to-equity ratio, the firm may choose to follow peer firms or the leader. This is a rational behavior for managers to exhibit when they are herding due to information distortion, which can result in both good and bad performance. The second trigger that leads to rational herding is reputational fear. When the manager is uncertain about his/her ability, he/she is likely to follow the peer managers. If the decision leads to unsuccessful outcome,

market will not penalize the manager's reputation because all peer managers have made same mistake. On the contrary, if the uncertain manager choose a different path and become unsuccessful, market will penalize that manager's reputation considering him/her as a low ability manager (Scharfstein and Stein, 1990). This approach of managers is also known as sharing-the-blame effect. Oruç and Şen (2009) suggested the propensity of decision makers to steer clear of distress and regret could encourage them to adopt capital structures of industry peers. As a result, corporations will be better prepared to absorb failure when all of their peers make poor decisions than they will be to tolerate failure when their peers succeed. In this way, concern for reputation fuels manager's tendency to follow their peers. When an investment manager's pay is based on his performance compared to the peers, the manager will receive lower compensation if peers outperform the manager. In that case, he/she is more likely to follow the benchmark. Thus this relative performance measurement and compensation policy offers incentives to the managers to mimic their peers' capital structures. Reputation and compensation concern lead to herding behavior of manager (Oruç and Şen, 2009). Lieberman and Asaba (2006) explained the imitation of peers focusing on rivalry. To preserve competitive position while alleviating rivalry, firm can mimic its peers. Choosing a different strategy is risky as the success of that strategy is uncertain. On the contrary, mimicking the strategy of peers brings legitimacy and uncertainty. This concept is extended to the issue of leverage which is recognized as source of competitive advantage. The Social Learning Theory developed by psychologist Albert Bandura highlights the role that imitation, modeling, and observational learning play in influencing behavior. People gather knowledge from direct experience and through observation and imitation of other's action. Through observational learning process, managers observe the action (capital structure) and consequences (success or failure) of peers. Replication of financial policy of old and successful firms by newer firm, as reported by Adhikari and Agarwal (2018), can be explained by observational learning process. Also, 'old and successful' firms can be considered as 'model' as newer firms learn from their actions and reward (vicarious reinforcement). For these reasons, researchers use this social learning theory of Bandura (1977) to explain peer effects.

4. Literature Review

4.1 Traditional literature of capital Structure

4.1.1 Bangladesh Perspective

Researchers have explored the area of capital structure from the perspective of Bangladesh. Their focus is on different theories or model of capital structure such as MM Theory, Agency conflicts etc. Among them, Chowdhury (2004) is the pioneer. His study attempted to find the determinants of capital structure focusing on agency theory of capital structure. Cross sectional study on Japanese and Bangladeshi firms during two periods of 1989 to 1994 and 1995 to 2000 revealed that Bangladeshi firms' capital structure can be explained by agency theory as bankruptcy cost has significant negative impact and agency -debt has significant positive influence on debt ratio. Among other variables, profitability and operating leverage have significant negative effects

on debt ratio. Lima (2010) studied the listed Pharmaceuticals companies from DSE to explore their capital structure. The study included the agency cost of equity, growth rate of the enterprise, Degree of operating leverage, risk of bankruptcy, tangibility of assets and capacity of servicing debt as potential explanatory variables of the Debt ratio. Findings from Multiple regression disclosed that all six variables were significant for capital structure and theory of agency cost as well as static trade off can describe the pattern of capital structure in Bangladesh.

Hossain and Hossain (2015) examined the capital structure theories on 74 manufacturing listed companies from Dhaka Stock Exchanges (DSE) during 2002 to 2011 by employing PCSE and random effect (RE) model. They reported positive effects of managerial ownership on leverage ratio. Firms' growth rate, DSC, tax shield, cost of financing, available free cash, dividend and cost of agency generate negative effects on debt ratio. The findings support the prominence of both pecking order (preference of internal fund over external equity and debt fund) and trade off theory. Study of Siddiqui (2012) on 24 NBFI during 2006 to 2008 revealed that Firms' growth, DSC, liquidity condition, age, and size can explain LTDR. The study explained STDR by firms' size, liquidity and operating leverage. Among others, Alom (2013) reported positive effects of MB (market value to book value) ratio and negative effects of collateral (tangibility of assets), profitability and liquidity on debt ratio after studying 44 firms listed in DSE during 2004 to 2011. Also, the study didn't find significant effects of dividend and firm size on debt ratio. Jahan (2014) reported after studying 9 textiles enterprises during 2008 to 2012 that profitability and tangibility have negative effects on debt ratio.

4.1.2 Global Perspective

Traditional firm specific, macro-economic variables are subject matter of capital structure study around the world. Findings have unveiled several firm specific factors as key for determining the capital structure in those. However, findings of those studies are not universal. Bancel and Mitto (2004) reported after surveying managers from 16 European countries that managers are concerned regarding dilution of earnings and financing flexibility while issuing common shares or debt securities. Legal environment or conditions of a country is a key determinant of debt financing. Psillaki and Daskalakis (2008) examined SME's capital structure through a cross country analysis on firms of Greece, France, Italy, and Portugal. The findings reflected that firm size has positive impact and tangibility, profitability, risk is negatively related to leverage. Overall, individual company specific features are more prominent than individual country specific features in determining capital structure. Study on UK firms during 1998-2012, it was concluded that the affiliation between managers' ownership and firms' debt ratio is non-monotonic (Sun, Ding, Guoand Li, 2016). In contrast, the association between institutional investors' ownership and debt ratio is positive. Their findings were crucial in the field of ownership structure, financing and capital structure. In China, Hu, Yao and Zhou (2020) investigated the capital structure of 599 non-financial and non-real estate corporations for the period of 2007 to 2016. Findings from PSTR and multiple regression model stated that with concentrated ownership, firms can achieve optimal capital structure with higher debt level. Also, the ideal capital structure

varies across industry. Study on listed Australian firms in SIRCA during 1999 to 2012 revealed leverage, tangibility, MB ratio and size move in similar direction but profitability has inverse association with leverage (Li and Islam, 2019). Sikveland and Zhang (2020) reported from panel regression output that firms' profitability lower the debt level. Their study on the Salmon farming industry of Norway during 2001 to 2014 further revealed that listed companies are expected to count on non-debt fund as the listing of firms and leverage have negative connection. Also, asset structure (tangibility) is positively related to the leverage level. Their findings are crucial for cyclical industries. During the period of 2003-2014, Allini, Rakha, McMillan and Caldarelli (2018) examined market timing hypothesis and pecking order on a sample of listed Egyptian firms. Their results proposed that most profitable corporations are less probable to adopt outside financing for meeting fund demand. When there is deficit or requirement for external financing, equity is issued. Thus Egyptian firms follow revised pecking order theory. In India, findings of a study by Handoo and Sharma (2014) on 870 listed firms during 2001 to 2010 revealed that profitability, size, cost of debt fund. Debt ratio increases with Debt servicing ability as well as tax rate. Tangibility and size of firm have statistically significant positive effects on debt ratio. Overall, studies from different countries and sectors provide diverse insights on capital structure. Different factors exhibited diverse influence on leverage across different context.

4.2 Peer Pressure

Peer pressure is the impact of a group on individual members of that group's behavior, so that the individuals are more likely to do what everyone else does. Given the established effects of peers on a range of corporate practices, as discussed by Malik et al. (2018), it is plausible to infer that a firm's decisions regarding its capital structure may also be influenced by the choices made by its peer group. Gao and Zhang (2018) found that managers are more likely to manipulate accounting information if he/she believes that peer managers are manipulating. When rewards are associated with performance, managers are likely to manipulate to win the rivalry. If the manager perceive its rival as manipulator, he/she is like to manipulate more to compete with the rivals in terms of rewards. When one firm invests in internal control, it reduces own manipulation as well as mitigates manipulation pressure on peer firms. In the area of corporate governance, a study of John and Kadyrzhanova (2008) on US public firms has revealed that decisions to take anti-takeover policy (ATP) are positively influenced by the measures taken by their peers and importance of excellent corporate governance is most in the scenario where the peers have good corporate governance. ATP makes acquisition costly and its effects on preventing takeover depends on availability of relatively cheaper alternatives (un-entrenched peers). When one firm adopt ATP, its peers may feel pressure to also adopt APT to avoid being the attractive and cheaper alternative for potential acquirer. Foroughi, Marcus, Nguyen, and Tehranian (2021) also confirmed the influence of peer pressure in adoption of anti-takeover policies of firms.

Banking industry is highly competitive and saturated. Hence, maintaining competitive advantage is a much needed aspect. As CSR is seen as a strategy to enhance

bank's reputation and to bring competitive advantage, it conveys a positive signal to all stakeholders. Hence, banks are reasonably expected to follow the CSR activities of their peers and response accordingly (Malik, Mamunand Amin, 2018). Using this argument, Malik et al. (2018) investigated peer effects on CSR practices of firms and their long term influence on performance in banking industry of Bangladesh during 2002-2011. Defining peer banks based on size and operations, average CSR expenditures of peers was found as a significant determinants of CSR expenditures while non-peer group's CSR expenditures was insignificant. Research conducted in China by Yang, Ye and Zhu (2017) during 2008 to 2015 revealed that if there is a dissimilarity in CSR activities within a group of firms, stakeholders and the general public will put pressure on that particular firm to raise CSR performance. Voluntary disclosures activities are also influenced by peer pressure. Lin, Mao and Wang (2018) documented that availability of information (through management disclosure) facilitates corporate transparency and reduce monitoring costs which in turns result in increased liquidity of stocks by attracting quasi-indexers. It also contributes to the transparency of information environment. This improved information environment brings in cheaper capital and reduces financing costs. This cheaper capital brings competitive advantage in product market. To maintain competitiveness, peer managers react to such action. They strategically make more disclosure to improve own information environment and remain competitive for capital.

Grennan (2019) disclosed effects of peer firms on dividend policy after conducting research on US firms from the NYSE, the NASDAQ and the American Stock Exchange during 1975-2011. If the peer changes dividend, firms increase their dividend disbursements by 15%. Firms accelerate the average time taken in order to change dividend roughly by 1.5 quarters due to their peers. On the contrary, share repurchase didn't show any peer effects. To conclude, peer interdependencies accounts for twelve percent dividend payout. In USA, study conducted by Adhikari and Agarwal (2018) found evidence of peer pressure on firms' dividend payout policy i.e., share repurchase and dividends from a sample of non-utility non-financial companies in USA during 1965 to 2010. If Firms confront greater competition in product market, operate in an improved information environments the peer effects is more prominent. Newer and smaller firms' dividend payout policy are significantly influenced by peers of similar age and size. Their findings also confirm the theory of imitation based on rivalry that firms imitate their competitors or peers in order to sustain competitive parity.

4.3 Peer pressure and Capital Structure

Frank and Goyal (2009) endeavored to understand peer effects on leverage decisions. Their study on the US firms on Compustat during 1950 to 2003 included industry median leverage, size, profitability of corporations, risk factors, assets' quality, tax, credit rating, inflation etc. The regression output revealed industry median leverage as a key determinant of firms' capital structure. Firm conducting operations in industry with high leverage are likely to have high leverage. Among other factors, Tangibility of assets (assets' quality or nature), size of the individual firm and expected inflation have significant positive effects on leverage while profitability and MV

to BV ratio (market opportunities) have significant negative impact on leverage. Additionally, dividend-paying companies typically have low debt levels.

Leary and Roberts (2014) conducted a seminal research regarding peer effects and capital structure in the USA during 1965 to 2008 on 9,126 unique firms from 217 industries. They used Book leverage, market leverage, changes in leverage (book), and changes in leverage (market), issuance of equity instruments, and issuance of debt instruments as dependent variables. The study revealed vital role of peers in corporate capital structure decision. Small and less prosperous entities are more responsive to the large and more successful peers. But the successful and larger firms are not responsive to the smaller and less prosperous peers. Among the firm specific factors, sales, assets' tangibility, MB to BV ratio, firm's profitability and equity shock were found as significant where peer firms' equity shock and profitability were found crucial for capital structure.

A study covering 87 industries from 47 countries including USA of Francis, Hasan and Kostova (2016) attempted to assess when the peer matters. They included sales (log), MV to BV ratio, market and book value based leverage, EBITDA to sales and net PPE to assets as firm specific and peers specific factors where GDP growth, equity market size, debt market size, credit, inflation, protection, disclosure, creditors right etc. the findings show that peers are important for capital structure decision. The variation in peer firms' leverage can explain 5.57% variation in market leverage ratio and 3.86% disparity in book leverage. Among the firm specific factors, equity shock and profitability have negative effects on leverage and MV to BV ratio, tangibility and sales have positive impact on debt ratio. Macroeconomic factors - inflation has positive and GDP growth rate exhibits negative association with leverage. In (2019) examined asymmetric peer effects on leverage choice in the USA within the period 1988 to 2014, emphasizing the manufacturing sector and utilizing data spanning at least 10 years. The study employed a fixed effects model and IV approach. Presence of asymmetric or uneven peer effects was concluded from the study. Firms respond to over or under leverage as a response to their peers. Over-Levered firms adjust (reduce) leverage faster when their peers experience negative equity shock than when the peers experience positive equity shock. On the other hand, under-levered firms' adjustment of leverage also increases monotonically with peer equity shock.

Harford, Klasa and Walcott (2009) investigated the merger and acquisitions of US firms during 1980 to 2000 to understand the association between target leverage for the target firm and financing the deal. They found that acquirers set target debt ratios based on those factors. When there is deviation from target debt ratio, they bring it back to target by adjusting the deals. When the bidders' debt ratio exceeds that of the targets, the deal is settled through equity issuance. The study argued the presence of a target TDR and the firm's effort to achieve that. While determining the target debt ratio, managers consider the industry median leverage.

In China, peer effects and firms' financial structure were studied on sample of all non-financial firms of 'A' category in SSE and SZSE during 2000-2013. Capital structure, size, growth, Profitability

and liquidity were used as explanatory variables from firm specific and peer firms perspective. Employing an IV model and fixed effect IV model, the study concluded capital structure to be affected by that of peer firms. Among firm specific factors, leverage increases with firm's size and growth. It falls with liquidity and profitability. Also, it concluded that maturity of long term loan and long term liability are affected by those of peer firms while short term loan and liability are unaffected (Zhong and Zhang, 2018).

In Italy, Orlando (2018) studied the peer effects on capital structure which included 29,067 companies from 84 industries during 2008 to 2016. The study included size, profitability, growth, tangibility as firm specific factors and peer leverage (financial debt to total assets), size (log- Sales), profitability, growth and quality of assets as industry specific factors. Employing a time-industry fixed effect model, tangibility, size and growth opportunities have positive effects on leverage. Profitability is inversely associated with debt ratio. Peer leverage was statistically significant as a determinant of capital structure along with peer profitability.

In Malaysia, Ayaz (2019) examined 169 Malaysian firms listed under manufacturing sectors during the period of 2011 to 2016. It was reported that the firm doesn't make their financing decision in isolation rather peer firms' decisions affects firm's decision. Capital structure and profitability exhibits non-linear relationship. Once the firm reaches its optimal stage, growth opportunities and debt ratio exhibit inverse association with profitability.

In Pakistan, a study on randomly selected 40 firms from 4 industries during 2007 to 2012 was conducted by Amin, Hashmi and Saeed (2016). Fixed effect regression model was employed and the research findings revealed that peer leverage has insignificant positive influence on capital structure decisions. Thus, the authors didn't find the effect of peer capital structure decisions on firm capital structure. However, contradictory results were reported by Anwar, Hassan and Hameed (2019) in Pakistan. Their study on 13 non-financial sectors of Karachi stock exchanges during 2005-2015 included Peer leverage, peer market to book ratio, profitability, tangibility, size as well as firm specific MV to BV ratio, profitability, tangibility or assets' quality, firm's size. GMM model for panel regression was employed using one period lag of explanatory variables. The findings suggest that peer leverage is the most influential factor determining the capital structure.

Table 4.1: Literature Review

Capital Structure Literature – Bangladesh Perspective			
No.	**Detail of Article**	**Variables**	**Findings**
1	Dr. A.A. Mahboob Uddin Chowdhury (2004) – Capital Structures Determinants: Evidence from Japan and Bangladesh	Debt ratio, agency equity, agency debt, bankruptcy risk, growth rate, profitability, operating leverage	Bankruptcy risk (-), operating leverage (-), profitability (-) agency debt (+) affect leverage.

2	Mahabuba Lima (2010) - An Insight into the Capital Structure Determinants of the Pharmaceutical Companies in Bangladesh	Debt ratio, agency cost of equity, growth rate, operating leverage, bankruptcy risk, tangibility ratio, DSC	Growth rate (+), operating leverage (+), tangibility (+) and DSC (+) bankruptcy risk (-) agency cost of equity (-) affect leverage.
3	Md. Imran Hossain and Md. AkramHossain (2015) - Determinants of Capital Structure and Testing of Theories: A Study on the Listed Manufacturing Companies in Bangladesh	TDR, LTDR, ownership, Growth rate, profitability, Liquidity, DSC ratio, Dividend, Agency cost, tangibility.	Profitability (-), Growth rate (-), Tangibility (-), DSC (-), FCF (-) and dividend (-) and managerial ownership (+) affect leverage.
4	Khairul Alom (2013) - Capital Structure Choice of Bangladeshi Firms: An Empirical Investigation	Leverage, liquidity, dividend payment, MV to BV ratio, profitability, size, tangibility	Liquidity (-), collateral (-), profitability (-), MV_to_BV ratio (+) have effects on leverage.
5	Nusrat Jahan (2014) - Determinants of Capital Structure of Listed Textile Enterprises of Bangladesh	Total debt ratio, profitability, size, growth tangibility,	Tangibility (+), profitability (+) have effect on leverage.
6	Sayla Sowat Siddiqui (2012) - Capital Structure Determinants of Non-Bank Financial Institutions (NBFIs) in Bangladesh	TDR, STDR, LTDR, age, firm size, OL (operating leverage), profitability, liquidity, DSC ratio, growth rate.	DSC (-), liquidity (-), OL (-), size (+) and growth rate (+) positively drive TDR.
	Capital Structure Literature –Global Perspective		
1	Ji Sun, Li Ding, Jie Michael Guo and Yichen Li (2016) - Ownership, capital structure and financing decision: Evidence from the UK	Leverage (book and market), managerial share ownership, institutional ownership, profitability, tangibility, MV to BV ratio, sales growth, dividend, non-debt tax shield	Institutional and managerial ownership (+), tangibility (+), profitability (+), Non-debt tax shield (+), MB ratio (-), sales growth (-) rate have impact on leverage.
2	Alessandra Allini, Soliman Rakha, David G. McMillan and Adele Caldarelli (2018) - Pecking order and market timing theory in emerging markets: The case of Egyptian firms	Net Debt issue, net equity issue, financial deficit, book value of debt, market based debt, market Size, tangibility, profitability, MB ratio.	Revised pecking order is adopted by firms. Tangibility (+), profitability (-), Size (+) affects leverage. Equity issuance is preferred to debt issuance for external financing.
3	Maria Psillaki and Nikolaos Daskalakis (2009) - Are the determinants of capital structure country or firm specific?	Debt Ratio, asset Structures, size, growth profitability, risk.	Size (+), tangibility (-), profitability (-) and risk (-) affect leverage. Around the world, firm specific factors are key determinant of leverage rather than the country specific factors.

4	Franck Bancel and Usha R. Mittoo (2004) - Cross-Country Determinants of Capital Structure Choice: A Survey of European Firms	Questionnaire on country's legal and institutional environment was used.	Financial flexibility and EPS dilution are main issues to be considered while issuing debt or equity. Institutional environment is more important than the legal environment.
5	Anshu Handoo and Kapil Sharma (2014) - A study on determinants of capital structure in India	TDR, LTDR, STDR, profitability, growth, tangibility, size, cost of debt, liquidity, financial distress cost, tax rate, DSC, Age	Profitability (-), size (-), tax rate (-), DSC (-) tangibility (+) and growth rate (+) influence debt ratio.
6	Larry Li and Silvia Z. Islam (2019) - Firm and industry specific determinants of capital structure: Evidence from the Australian market	Leverage, MV_to_BV ratio, tangibility, profitability, size, industry specific factors – growth rate, profit margin ratio, beta, market competition, P/E ratio, tobin's Q , GDP contribution	Size (+), MV to BV ratio (+), tangibility (+) and profitability (-) has negative effects on leverage. Among industry factors, GDP contribution and Tobin's Q are significant.
7	Marius Sikveland and Dengjun Zhang (2020) - Determinants of capital structure in the Norwegian salmon aquaculture industry	Long term debt ratio, short term debt ratio, total debt ratio, liquidity ratio, return on Sales, growth rate, asset structures (fixed assets to total assets), asset size.	ROS (-), assets' size (-), listing status (-) and assets structures (+) have impact on TDR.
	Peer Effects – Literature Review		
1.	Mahfuja Malik, Md ALMamun and Abu Amin (2018) Peer pressure, CSR spending, and long-term financial performance	CSR, net Income, interest income and expenditures, total assets, management expenditures, ROS, loans, deposits, no. of employees and branches	Peer CSR is a significant determinants of CSR expenditures. CSR expenditures has positive impact on profitability.
2.	Shenggang Yang, Heng Ye and Qi Zhu (2017) - Do Peer Firms Affect Firm Corporate Social Responsibility?	CSR, peer CSR, leverage, growth opportunities, size of board, profitability, MB_to_BV Ratio	Peer CSR expense is significant determinants of CSR disbursements decision of individual firm.
3.	Yupeng Lin, Ying Mao and Zheng Wang (2018) - Institutional Ownership, Peer Pressure, and Voluntary Disclosures	Peer size, return volatility, earnings volatility, peer RandD expenditures, equity-debt issuance, industry Size	Peer effects affect voluntary disclosure decisions and the effects increases with institutional ownership.
4.	PingyangGao and Gaoqing Zhang (2018) - Accounting Manipulation, Peer Pressure, and Internal Control	Mathematical model based methodology has been used without real data.	Perceived manipulation of peer firms influences manipulation of firm's financial statements.

5.	Kose John and DalidaKadyrzhanova (2008) - Peer E§ects in Corporate Governance	Governance index, anti-takeover provisions, size, age, capital investment, tobin's Q, leverage, cash flow, cash holdings, Interest coverage ratio, RandD expenditures, advertisement, ROA, managerial ownership	Adoption of anti-takeover provisions is influenced by decision of peer firms. Good governance of peers also create pressure for good governance in firm level.
6..	PouyanForoughi, Alan J. Marcus, Vinh Nguyen and Hassan Tehranian (2021) - Peer Effects in Corporate Governance Practices: Evidence from Universal Demand Laws	Governance provisions, board experience, CEO duality, board compensation, cash compensation, free cash flow, Assets, book leverage, RandD expenditures, ROA, firm age	Adoption of anti-takeover provisions is influenced by peer effects.
7.	Binay K. Adhikari and AnupAgrawal (2018) - Peer Influence on Payout Policies	Firm Specific and peers' dividend payment, sales growth, Size, MV_to_BV, profitability, RandD, equity risk	Smaller and newer firms' dividend payout policy is shaped by peer effects. In a competitive market, greater degree of peer effects is experienced.
8.	Jillian Grennan (2019) - Dividend payments as a response to peer influence	Dividend yield, repurchase yield, profitability, firms' life cycle, MV_to_BV ratio, leverage (book measured), tangibility, cash flow to capital, idiosyncratic risk, institutional ownership, investment to capital	Firms hurry up the required time to alter dividend by about 1.5 quarters and raise disbursements of dividend by 16% due to peer changes od dividend policy. Stock repurchases show no peer effects. Investors expects peer effects as well. Overall, 12% of total dividend is due to peer effects.
Peer Effects on Capital Structure - Literature Review			
1.	Mark T. Leary and Michael R. Roberts (2014) - Do Peer Firms Affect Corporate Financial Policy?	Leverage, peer leverage, profitability, tangibility, sales, book to market ratio, equity shock	Peer firms are vital for determining the financial policy of a firm. Smaller and less successful firms are influenced by larger and more successful peer firms.
2	Murray Z. Frank and Vidhan K. Goyal (2009) - Capital Structure Decisions: Which Factors Are Reliably Important?	Industry median leverage, tangibility, MV_to_BV Ratio, profitability, inflation (Expected)	Median leverage ratios of the respective industry has a significant consequence on leverage of individual firm.

3	Jarrad Harford, Sandy Klasa and Nathan Walcott (2009) - Do firms have leverage targets? Evidence from acquisitions.	Industry median leverage, tangibility, size, MV_to_BV Ratio, profitability, bankruptcy risk, uniqueness of firm, sales expense to sales	Acquirer set a target debt ratio based on industry leverage and other firm specific factors. Then they adjust the deal to match actual leverage level to target level.
4	Bill B. Francis, Iftekhar Hasan and Gergana L. Kostova (2016) - When do peers matter? : A cross-country perspective.	Sales (log), market to book ratio, market leverage, book leverage, EBITDA to sales, net PPE to assets, inflation, GDP growth	5.57% variation in market leverage ratio and 3.86% deviation in book leverage can be explained by the deviation in peer firms' leverage.
5	Tianli Zhong and Tianyu Zhang (2018) - "Peer effects" in capital structure decision of Chinese firms-empirical investigation based on Chinese a-share listed firms	Peer capital structure, size, growth, profitability, liquidity, STDR, LTDR, TDR	Capital structured decisions are affected by peer firms' capital structure. Changes in capital structure can be explained by that of peer firms. Maturity of LTD can also be explained by those of peer firms.
6	Giulia Orlando (2018) - Peer effects on capital structure: evidence from the Italian market	Peer leverage, size, profitability, tangibility, growth opportunity	Industry leverage (+), Size (+), tangibility (+), growth opportunities(+), profitability(-) have effect on leverage.
7	Muhammad Ayaz (2019) - The effect of peer firms determining firm capital structure: evidence from manufacturing in Malaysia	Peer leverage, profitability, growth opportunity	Firms respond to peers' capital structure choices. There exists a non-linear association between profitability and capital structure and growth opportunities.
8	Maria Amin, Shujahat Haider Hashmi and Muhammad Bilal Saeed (2016) - Impact of peer firms on capital structure of firm: Evidence from Pakistan	Peer leverage, equity shock, tangibility, market to book ratio, profitability.	Peer MV_to_BV ratio, tangibility, profitability affect corporation's financing decisions. Firm specific factors - profitability affects capital structure. Peer leverage has insignificant influence on capital structure.
9	Muhammad Mudassar Anwar, Arshad Hassan and Filza Hameed (2019) - Peer Effect in Firms' Financial Decision Making: Evidence from Corporate Capital Structure	Peer leverage, profitability, MV_to_BV ratio, tangibility, size, stock market performance, interest rate	Peer leverage was found to be the most influential determinants of capital structure. Stock market performance and interest rate were also found significant.

10	Hyun JoongIm (2019) - Asymmetric peer effects in capital structure dynamics	Equity shocks, leverage (book), leverage (market), industry leverage, MV_ to_BV ratio, tangibility, profitability, firm size, depreciation, RandD expense.	There exist asymmetric peer effects between over-levered and under-levered enterprises. 'U' shaped relationships exist between over-levered firms' adjustment and peer equity shocks. Under-levered firms adjustment

5. Methodology

5.1 Hypothesis Development

The hypothesis of peer firms' influence on firm's decision is grounded in the tendency to imitate the activities or behavior of peers to achieve legitimacy or reduce uncertainty. Empirical studies (e.g., Frank and Goyal, 2009; Leary and Roberts, 2014, Malik et al., 2018) supports the idea of peer firms exerting influence on various aspects of business decisions. However we acknowledge that findings may vary across different institutional settings or context, country and region (Lima, 2010; Lagoarde-Segot, 2013). This study wants to explore the issue from the context of Bangladeshi firms. Frank and Goyal (2009) have made two interpretations on variation of leverage across industries. In one interpretation, they have argued that managers of firms use median leverage ratio of their respective industry as a standard for their firm and adjust their capital structure based on that benchmark. The second argument claims that firms of an industry face some common forces like the nature of competition, regulations, nature of assets, business risk etc. which influence their financial policies and decisions. Driven by this mechanism, we argue that influence of peer firms extends to capital structure choice of firms.

H_1=There is significant positive relationship between peers' capital structure and firm's capital structure.

5.2 Data Sources and Sample Size

We have used secondary data gathered from DSE and audited annual reports of sample firms for 7 years from 2015-16 to 2021-22. Out of non-financial sectors of DSE, we have selected the Food and Allied, Power and Fuel, Cement and Ceramic sector for this study. We have excluded financial sectors as they are considered to be different from others. Inclusion of larger number of peer firms (listed firms from a particular sector) provides a more comprehensive understanding of industry dynamics and potential influence of peers on capital structure. Hence we have considered availability of data of listed firms under those sectors, understanding of industry and time constraints while determining sectors and time period for this study. Firms, that were not listed during above mentioned period and data was unavailable, have been omitted. To control the impact of outliers, we have winsorized the data at 5% level.

Table 5.1: Sample

Sector	Listed Firms in Sector	Selected Firms from Sectors	Number of Years	Total Observations
Food and Allied	21	12	7	84
Power and Fuel	23	16	7	112
Cement	7	7	7	49
Ceramic	5	5	7	35
Total	56	40	7	280

Author's Calculation

5.3 Specification of Model

This study employs three models based on different measurements of leverage or capital structure. Along with serving the purpose of checking robustness, each model represents specific financing decisions. Both STDR and LTDR based model check whether the decisions on maturity of debt are influenced by their peers (Zhongand Zhang, 2018). Here is the basic contemporaneous model based on that of Frank and Goyal (2009)-

$$\text{Leverage}_{i,j,t} = \alpha + \beta_1 \text{ Peer Leverage}_{-i,j,t} + \beta_2 \text{Control Variables}_{i,t} + u_i + \varepsilon_{it}$$

After adding the key variable of interest and other control variables to the model, we get the specific model for this study

Model 1: Total Debt Ratio

$$TD_Assets_{i,t,j} = \alpha + \beta_1 Peer_TDR_{-i,j,t} + \beta_2 MB_ratio_{i,t} + \beta_3 OCF_ratio_{i,t} + \beta_4 Asset_growth_{i,t} + \beta_5 ISC_{i,t} + \beta_6 tangibility_{i,t} + \beta_7 Int_Cost_{i,t} + \beta_8 ROA_{i,t} + \beta_9 L_age_{i,t} + \beta_{10} L_size_{i,t} + \beta_{11} Liquidity_{it} + u_i + \varepsilon_{it} (5.3.1)$$

Model 2: Short Term Debt Ratio

$$STD_Assets_{I,t,j} = \alpha + \beta_1 \text{ Peer_STD}_{,-i,j,t} + \beta_2 MB_ratio_{i,t} + \beta_3 OCF_ratio_{i,t} + \beta_4 Asset_growth_{i,t} + \beta_5 ISC_{i,t} + \beta_6 \text{ tangibility}_{i,t} + \beta_7 Int_Cost_{i,t} + \beta_8 ROA_{i,t} + \beta_9 \text{ L_age}_{i,t} + \beta_{10} L_size_{i,t} + \beta_{11} Liquidity_{i,t} + u_i + \varepsilon_{it} (5.3.2)$$

Model 3: long Term Debt Ratio

$$LTD_Assets_{i,t,j} = \alpha + \beta_1 Peer_LTD_{-i,j,t} + \beta_2 MB_ratio_{i,t} + \beta_3 OCF_ratio_{i,t} + \beta_4 Asset_growth_{i,t} + \beta_5 ISC_{i,t} + \beta_6 \text{ tangibility}_{i,t} + \beta_7 Int_Cost_{i,t} + \beta_8 ROA_{i,t} + \beta_9 \text{ L_age}_{i,t} + \beta_{10} L_size_{i,t} + \beta_{11} Liquidity_{i,t} + u_i + \varepsilon_{it} (5.3.3)$$

5.4 Discussion of Variables

5.4.1 Dependent variables

To determine the leverage of a firm, book value measurement and market value measurement can be used. Book Value based approach uses value of Assets written in the books of accounts where Market Value based approach measures assets using value derived from the market. This study have adopted a book value approach in accordance with the methodology of Leary and Roberts (2014), Hossain and Hossain (2015) and Zhong and Zhang (2018). Also, the financial managers concentrate on book value measurement while deciding the leverage or capital structure for their firms (Graham and Harvey, 2001).

Table 5.2 : Variables

No.	Variable Name	Variable Definition	Calculation	Expected Sign
		Dependent Variable		
1	TDR	Total Debt ratio	Total Liabilities / Total Assets	
2	STDR	Short Term Debt Ratio	Short term debt / Total Assets	
3	LTDR	Long Term Debt ratio	Long Term Debt / Total Assets	
		Independent Variable – Key Variable of Interest		
1	Peer_TDR	Peer Total debt ratio	Median TDR of industry	+
2	Peer_STDR	Peer Short term debt ratio	Median STDR of industry	+
3	Peer_LTDR	Peer Long Term Debt Ratio	Median LTDR of the industry	+
		Control Variables		
1	Tangibility	Portion of Tangible assets	Long term Tangibles assets / Total Assets	+
2	ROA	Profitability	Operating Profit / Total Assets	-
3	L_Size	Firm's size	LN of Book Value of Assets	+
4	L_Age	Maturity of Firm	Natural logarithm of Age	-
5	Asset_Growth	Growth of Firm	Annual Changes in Total Assets	+
6	MB_Ratio	Market Value to book value Ratio (MV to BV ratio)	MV of Equity/ BV of equity	-
7	Liquidity	Current ratio	CA / CL	-
8	ISC	Interest Service Coverage ratio	EBIT/ interest Expense	+
9	Int_Cost	Cost of Debt Financing	Interest Expense / Total Debt	-
10	OCF_Ratio	Ability to generate operatingCash flow	OCF / Total Assets	-

1. Total Debt Ratio (TDR): TDR measures leverage which indicates the contribution of borrowed fund to the total assets. This ratio has been used as the key measurement of leverage in all literatures of capital structure. This study calculates TDR by

dividing the total liabilities of firms by total book value of assets which has been used by Leary and Roberts (2014), Frank and Goyal (2009), Hossain and Hossain (2015).

2. Short Term Debt Ratio (STDR): Short term debt are those liabilities that need to be settled within a year. This ratio (STDR to Assets) is used this ratio to break down the overall leverage of the firms based on their maturity. Zhong and Zhang (2018) used short term loans to total assets ratio as a measurement to assess whether peer affects debt financing maturity decisions of firms. STDR can be used to examine robustness as well as to assess peer effects on debt maturity decisions.

3. Long Term Debt ratio (LTDR): It reflects the share of long term loans in capital structure. Firms need long term financing to finance capital investment which are likely to generate return in the long run. In Bangladesh, bank loans and leasing companies are providers of long term debt as the bond market is not developed yet. Widely used as a measurement of leverage, Zhong and Zhang (2018) used LTDR as a measurement to assess whether peer affects debt financing maturity decisions of firms. This study includes the LTDR following the study of Handoo and Sharma (2014), Hossain and Hossain (2015), Frank and Goyal (2009).

5.4.2 Independent Variable

Key variable of interest: Peer Leverage

Following Frank and Goyal (2009), Peer Firms' leverage for firm 'i' in year 't' from sector 'j' has been defined as the median debt ratio of firms of that sector j in year t. An alternative measurements for peer firms leverage characteristics would be the average leverage of industry (Francis et al., 2016).

1. Peer Debt ratio: The key measurement of peer leverage or capital structure decision is Debt ratio measured by book value approach. Peer debt ratio will be used against the firm debt ratio to assess peer effects. Frank and Goyal (2009) used both market and book value approach of debt ratio while this study employs only book value based debt ratio. Based on their findings, this study anticipates a positive association between the firm TDR and peer firms' TDR.

2. Peer STDR: This ratio measures the leverage ratio of peer firms. As a potential determinant of debt maturity decisions in the short term, Zhong and Zhang (2018) used this measurement in their study. Following that, I have included it in this study. Based on their findings, we expect a positive association between Firm's STDR and peer STDR.

3. Peer LTDR: The peer firms' long term debt use characteristics is measured by this ratio. Zhong and Zhang (2018) used it to assess the peer effects on debt maturity decisions while Frank and Goyal (2009) used this ratio to check robustness of peer effects in capital structure. Following their findings, this study expect a positive association between firm's LTDR and peer LTDR.

Other than the key variable of interest, some additional firm-specific characteristics are included in this study as potential capital structure determinants.

1. Tangibility: Tangible assets refers to assets with physical presence like PPE, buildings, furniture etc. These assets are easier to value compared to intangible assets. Hence, tangibility of the assets reduces the financial distress. Due to lesser projected cost of financial distress and less conflict between lenders and

managers (agency conflicts), positive association is predicted between assets' tangibility and use of leverage. Tangible assets are preferred collateral for loans, thus it facilitates debt financing. Hence, firms investing in tangible assets are expected to utilize a more leverage than the firms spending in RandD and SGandA (Frank and Goyal, 2009). Lima (2010), Jahan (2014), Allini et al. (2018) described positive association between tangibility and leverage ratio.

2. Profitability: Profitability has been measured as Return on Assets (ROA). Profitable firms can utilize interest tax shields more than unprofitable firms. Also, agency conflicts arise when firms generate and accumulate free cash flow. To control that, debt financing might be a mechanism. As a result, profitable firms might have higher leverage. However, the relationship isn't so straightforward. Based on pecking order, firms favor retained funds due to risk and cost over external funds. Hence, when a firm generates funds internally, it is more likely to use that first rather than external financing (Frank and Goyal, 2009). Empirical studies of Chowdhury (2004), Hossain and Hossain (2015) and Alom (2013) have reported inverse effects of profitability on leverage. Here, we make the assumption that profitability and leverage usage are inversely related.

3. Firm Size: Total assets (log) is adopted as the firm size (Frank and Goyal, 2009). Large and diversified firms have more predictable earnings with lower risk of distress. Debt related agency cost is less for larger and reputed firms in the debt market. Hence, following the theory of trade off, larger corporations are expected to use a higher level of leverage. In reality, Siddiqui (2012) and Allini et al. (2018) reported positive influence of size on leverage ratio. However, Chen (2003) and Handoo and Sharma (2014) reported inverse effects of firm size on leverage ratio. Despite the variations in findings, here we anticipate positive association between leverage and firm size.

4. Firm Age: Log of firm age has been used to represent maturity of firm. Argued by Siddiqui (2012), firms rely more on equity funds than debt funds as the firms get older – i.e.; mature. Again, as the firm becomes more mature, its investment opportunities continue to decline. At the same time, mature firms may have a large sum of funds in their retained earnings or other reserves which can finance investment needs. However, Frank and Goyal (2009) reported positive association between leverage and firm's maturity and argued that due to reputation in the debt market and stable cash flow, mature firms can raise debt funds at lower cost. This study expects an inverse association between firm's maturity and debt level.

5. Growth Rate: Growth has been identified as the annual changes in total assets. When a firm grows rapidly, its internally generated funds are insufficient to fuel its growth. As a result, growing firms rely more on debt financing. Pecking order theory advocates using retained earnings first to finance its investment. Then it goes for debt financing. Thus, a growing firm used higher leverage. However, there is evidence on revised or modified pecking order theory as conveyed by Allini et al. (2018) and Chen (2003) where firms prefer inter financing (retained earnings) and Equity funds over debt funds. Lima (2010) and Hossain and Hossain (2015) testified positive association between leverage and growth rate of firms.

6. MV_to_BV Ratio: According to Adam and Goyal (2008), MV_to_BV ratio is considered as the most dependable proxy of assessing growth opportunities. Market timing is the key here. However, rising stock prices might be the result of mispricing. But it brings the opportunity to the managers to raise equity funds conveniently. Leverage and MV_to_BV ratio are predicted to have a negative correlation if managers take advantage of the opportunity (Frank and Goyal, 2009). However, Li and Islam (2019) refuted the idea of market timing and exploiting the opportunities in the equity market as they reported positive association between leverage and MV_to_BV ratio.

7. Liquidity: Liquid assets within a company serve as a cushion against sudden need of fund. So when a firm has a significant amount of liquid assets, it will utilize that internal fund ahead of short or long term borrowings. Thus the argument is supported by concept of pecking order. In opposite to that, theory of trade off suggests that more liquid companies have greater ability to pay off obligations on time. Siddiqui (2012) and Alom (2013) reported an inverse effect of liquidity on leverage. Negative relationship is observed between leverage and free cash flow (Hossain and Hossain, 2015). Liquidity has been measured by current ratio.

8. OCF Ratio: Operating cash flow is the cash generated from day to day operation of business. OCF to total assets ratio measures the cash generating efficiency of firms. The more efficient a firm is in generating cash, the less it needs to depend on external financings. Theory of Pecking order postulates that companies use retained funds ahead of borrowed funds. Hence, this study expects inverse association between OCF ratio and leverage.

9. Debt Service Capacity (DSC): Debt service capacity shows a firm's capability to fulfill debt obligations out of its operating income. When a firm generates higher operating income, it can use that internally generated fund to meet its financing needs. After that, the firm will use external debt and equity financing. Hence, according to this argument, inverse association exists between debt service capacity and leverage. Following Lima (2010), interest service coverage ratio (EBIT/ Interest Expense) has been used as a proxy of debt service capacity.

10. Cost of Debt: Cost of debt has been calculated by interest expense divided by total debt. Debt funds are less costly than equity funds. But use of higher leverage increases the potential financial distress cost. In order to achieve the optimal capital structure, managers must weigh the advantages of the interest tax shield against the costs associated with financial distressy and bankruptcy.

5.5 Research Methods

This study employs a panel of 40 firms for 7 years. Panel data combines the properties of both cross section and time series. Firm specific variables are likely to have correlation among them. Hence, we need to check for collinearity. When the variance of residuals are not constant, there exists heteroscedasticity issues. As the range of the value of variables is large, variance is unlikely to be constant. It will violate the assumption of the model. If the value of a variable is correlated with its past value, there is an autocorrelation problem. There are some variables whose values increase or decrease gradually like age, total assets etc. (usually). So we

might face the autocorrelation issues in that case. Finally, as number of entities (firm) is larger than the time period (year) and time period is considerably small, unit root test is likely to be misleading. A micro panel is used in this study and for this type of panel, the unit root test has low power and there are chances that the test will conclude the panel as nonstationary when there is stationarity in the series (Karlsson and Löthgren, 2000). Hence, we have not included the unit root test here.

5.5.1 Multicollinearity

Multicollinearity states the situation where there is relationship between independent variables' pair. This scenario breaches the assumption of OLS. Statistical inferences will be less reliable if there is multicollinearity. Two different tests have been used to detect multicollinearity problems. In Pearson correlation matrix, if coefficient of correlation surpasses 0.8, then the pair has multicollinearity issues (Kennedy, 1985).Variance Inflation Factors (VIF) tests also measure the same problem. If the result of VIF test for a variable is exceeds 10, then there is a multicollinearity issue (Gujarati and Porter, 2008).

5.5.2 Heteroscedasticity

Another assumption of OLS is constant and finite standard errors of variables over a specific time period. It is called homoscedasticity. If the standard errors are not constant or finite, then heteroscedasticity problem arises. It reduces the precision of coefficients in regression analysis (Hayes, 2022). In this study Breusch Pagan test has been used. If value of p is smaller than benchmark of 5%, errors are not scattered evenly so data set isn't homoscedastic. In other word, the panel is heteroscedasticc and vice-versa. Null hypothesis of Breusch Pagan test is

H_0 = Constant variance (homoscedastic)

5.5.3 Autocorrelation

Independent errors is an assumption of OLS. Independent errors mean the error of one variable doesn't inform anything about the error of other variables. Using the Wooldridge test, this study searches for autocorrelation problems. In this test, if calculated value of P found to be lower than benchmark of 0.05, then the $H_0$is rejected. Autocorrelation problem doesn't exist at 1st order level. $H_0$of Woolridge test is

H_0: No first-order autocorrelation

5.5.4 Regression Analysis

Considering the findings of the preliminary tests including the Hausman test, this study will employ either FE (Fixed effect) or RE (Random effect) model. The test measures the consistency of the estimators. The Hausman'snull hypothesis claims the RE modelas appropriate. If researchers reject the null hypothesis, then they favor the fixed effect (FE) model. Null hypothesis of Hausman test is

H_0: Estimators are consistent

6. Data Analysis and Result Interpretation

We start analyzing the collected data with descriptive statistics which describes statistical properties of variables.

Table 6.1: Descriptive Statistics

	Mean	Median	Std. Dev	max	min	p75	p25	N
TDR BV	.5	.51	0.23	.997	.03	.67	.33	280
STD BV	.19	.12	0.21	.93	0	.3	.03	280
LTD BV	.08	.02	0.13	.71	0	.1	0	280
Median TDR	.51	.52	0.09	.84	.36	.54	.44	280
Median STDR	.19	.13	0.10	.48	.04	.26	.12	280
Median LTDR	.08	.06	0.04	.14	0	.12	.04	280
Age	27.76	23	14.19	72	8	37	18	280
Liquidity	1.88	1.25	2.04	15.74	.24	2.01	.89	280
Asset Growth	.09	.06	0.228	2.428	-.629	-.005	.158	280
Tangibility	.5	.51	0.22	.9	.01	.65	.36	280
OCF Ratio	.06	.05	0.09	.45	-.22	.1	.01	280
MB Ratio	19.57	7.38	42.65	354.2	.67	18.59	3.59	280
Asset Size MN	28,734	8,949	53,942	431,868	142.59	27,800	1,925	280
Market Cap MN	20,272	6,517	39,188	343,224	97.54	21,393	1,678	280
ROA	.08	.06	0.08	.45	-.18	.11	.03	280
Cost of Debt	.16	.08	0.41	3.44	0	.11	.05	280
DSC	375.7	3.51	4257	68,639	-72.59	12.96	1.56	280

Authors Calculation

Average debt ratio is 50% where median debt ratio is 51%. Maximum usage of borrowed fund in capital structure is 99%. Minimum 3% usage of borrowed fund or debt in capital structure has been observed. Top 25% firms' debt ratio is above 67%. On the contrary, firms sources 19% of their total capital using short term borrowing mechanism while long term debt is 8% of total assets. Peer TDR is 51% on average. Peer LTDR is 8% and STDR is 19% in the sample. Average maturity of the firms is 27 years. Average current ratio is 1.88 which indicates that firms maintain sufficient liquidity. Average assets growth of the sample is 9%. On an average, 50% assets are tangible in nature. This phenomena can be explained by the nature of industry that has been taken as a sample. Average cash generating efficiency of the firms is 5%. Growth opportunity has been found to be around 20 based on MV to BV ratio. On an average, firms have 28,734 million BDT equivalent assets while average market capitalization is 20,272 million BDT. Return on assets is 8%. Average cost of interest bearing debt is 16%. Debt service coverage ratio significantly biased by few

sample which uses very little amount of debt. By winsorizing the data at 5% level, this issue will be addressed.

This study follows two method to check the multicollinearity issue. 1st one is VIF (variance inflation factor) test. Following the suggestions of Gujarati and Porter (2008), value above 10 will be considered as the presence of multicollinearity.

Table 6.2 : VIF Test

1st Model		2nd Model		3rd Model	
	VIF		VIF		VIF
Median TDR	1.591	Median STD	1.145	Median LTD	1.595
L Cap	5.857	L Cap	5.883	L Cap	5.846
L Size	5.407	L Size	4.916	L Size	5.528
ROA	2.394	ROA	2.335	ROA	2.381
MB Ratio	2.234	MB Ratio	2.242	MB Ratio	2.239
L Age	2.221	L Age	2.182	L Age	2.202
Tangibility	1.835	Tangibility	1.853	Tangibility	1.836
OCF Ratio	1.769	OCF Ratio	1.753	OCF Ratio	1.755
Asset Growth	1.505	Asset Growth	1.309	Asset Growth	1.428
DSC	1.491	DSC	1.492	DSC	1.49
Cost of Debt	1.416	Cost of Debt	1.454	Cost of Debt	1.409
Liquidity	1.33	Liquidity	1.279	Liquidity	1.253
Mean VIF	2.421	Mean VIF	2.32	Mean VIF	2.413

Authors calculation

From the table of VIF test, evidence of multicollinearity in the data sets can't be found. However, only Asset size and market capitalization has higher value from VIF test but neither surpasses the benchmark level.

Table 6.3 : Correlation Matrix

Name of Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Median_ TDR	1.00													
(2) Median_ STD	0.47	1.00												
(3) Median_ LTD	0.49	-0.09	1.00											
(4) L_Cap	0.30	-0.18	0.40	1.00										
(5) MB_Ratio	-0.16	0.11	-0.14	0.24	1.00									

(6) OCF_ Ratio	0.10	-0.05	0.05	0.45	0.22	1.00								
(7) Tangibility	0.12	-0.12	0.14	0.13	-0.11	-0.04	1.00							
(8) Asset_ Growth	-0.21	-0.07	-0.12	0.20	0.26	0.03	0.19	1.00						
(9) Liquidity	-0.24	-0.15	-0.09	-0.13	-0.17	0.03	-0.06	-0.13	1.00					
(10) L_Size	0.42	-0.19	0.52	0.84	-0.00	0.29	0.12	0.25	-0.21	1.00				
(11) L_Age	-0.15	0.13	-0.14	0.06	0.50	-0.06	-0.44	0.16	-0.24	0.01	1.00			
(12) ROA	-0.01	0.00	-0.02	0.48	0.40	0.61	-0.13	0.02	-0.03	0.24	-0.01	1.00		
(13) DSC	0.07	-0.01	0.08	0.35	0.32	0.15	-0.14	0.01	0.06	0.25	0.27	0.26	1.00	
(14) Cost_of_ Debt	-0.05	-0.13	-0.01	0.06	0.05	0.14	-0.40	-0.11	0.04	0.05	0.21	0.02	-0.14	1.00

Authors Calculation

From the matrix, only one pair consisting of market capitalization and total assets exhibits strong correlation with 0.84. As these two variables are not key variable of interest for this study, I have decided to eliminate the variable L_Size from the study.

An assumption of ordinary least squares method is that the errors are constant that means the variance of residuals are equal over the time. This characteristics is called Homoscedasticity.

Table 6.4: breusch Pagan test

Model	Dependent Variable	chi2	Prob>chi2	Comment
Model 1	TDR	2.6e+31	0.0000	Heteroscedastic
Model 2	STDR	1.7e+33	0.0000	Heteroscedastic
Model 3	LTDR	17505.60	0.0000	Heteroscedastic

Authors Calculation

Here, null hypothesis of homoscedasticity is rejected at 0% level, hence, they are also heteroscedastic. Another assumption of OLS is absence of autocorrelation. In the presence of autocorrelation, the findings of regression model is unbiased but inefficient. To assess autocorrelation problem, this study employs Woolridge test

6.5 Table: Woolridge Test

Model	Dependent Variable	F(1, 37)	Prob>F	Comment
Model 1	TDR	16.013	0.0003	Autocorrelation
Model 2	STDR	54.039	0.0000	Autocorrelation
Model 3	LTDR	78.667	0.0000	Autocorrelation

Authors Calculation

In all model, the calculated value of p statistics is 0.00. Hence, at 1% level, H_0 of the Woolridge test is rejected. Null hypothesis states autocorrelation at 1st order level. Hausman test has been employed for each of the three model to determine which test should be used for the panel. The findings suggest fixed effect (FE) model to be used for all model.

Table 6.6: Hausman Test

Model	Dependent Variable	chi2(10)	Prob>chi 2	Comment
Model 1	TDR	73.38	0.0000	Fixed Effect is Preferred
Model 2	STDR	57.35	0.0000	Fixed Effect is Preferred
Model 3	LTDR	27.96	0.0018	Fixed Effect is Preferred

Authors Calculation.

Following table represents the outcome of regression analysis. *,**,*** indicates statistical significance at 10%,5% and 1% level respectively. Standard error are in parenthesis.

Table 6.7: Regression Output

	(1) TDR_BV	(2) STD_BV	(3) LTD_BV	Expected Sign
Peer_TDR	.177			+
	(.124)			
Peer_STDR		.06		+
		(.076)		
Peer_LTDR			.098	+
			(.101)	
Cost_of_Debt	-.089	-.075	-.13	-
	(.095)	(.097)	(.079)	
L_Cap	.028	.006	.002	+
	(.021)	(.012)	(.01)	
L_Age	-.022	.023	.006	-
	(.076)	(.086)	(.051)	
MB_Ratio	0	-.001	.001	-
	(.001)	(.001)	(.001)	
OCF_Ratio	-.137*	-.186***	-.022	-
	(.081)	(.067)	(.053)	
Tangibility	-.079	-.198*	.287***	+
	(.073)	(.104)	(.089)	
Asset_Growth	.019**	.012*	.007**	+
	(.008)	(.007)	(.003)	

Liquidity	-.079***	-.034**	.01	-
	(.017)	(.016)	(.009)	
DSC	.000	0.000*	0.00	+
	(0)	(0)	(0)	
ROA	-.399	-.01	-.066	-
	(.247)	(.211)	(.089)	
_cons	.03	.129	-.169	
	(.456)	(.248)	(.28)	
Firm Fixed Effect	Yes	Yes	Yes	
Industry Fixed Effect	Yes	Yes	Yes	
Significance of Model (Prob>F)	0.000	0.011	0.002	
Observations	280	280	280	
R-squared	.484	.225	.265	

Source: Authors Calculation

There are total 280 observations (firm-year) in this study. Both firm and industry fixed effect mechanism have been employed. Industry fixed effect will control the industry-specific effects (mentioned as common effects). By capturing the unobserved heterogeneity at the industry level, it allows us to isolate the impact of peer pressure.

1st model is significant at 1% level which estimates total leverage (TDR). Hence it can be concluded that employed model can explain the TDR better than a constant only model. Similarly, model 2 and 3 are significant at 5% and 1% level respectively. So both model of this study can fit the data better than the constant only model.

1st model can explain 48% variation in total debt ratio. On the other hand, model 2 can explain 22.5% variation in short term debt ratio and model 3 can explain 26.5% variation in long term debt ratio.

Peer Effects: This study assess the peer effects on capital structure. Peer effects has been measured as the median debt ratio of industry in a particular year. Here, in model 1, the findings suggest that there are positive effects of peer leverage on TDR of firm but the finding isn't statistically significant. The coefficient is 0.177. In model 2, the coefficient of peer STDR is 0.06 but the findings isn't statistically significant. In model 3, the value of the coefficient of peer LTDR is 0.098 but the findings isn't statistically significant. This study finds positive relationship between peer leverage ratio and firm's leverage and it is in agreement with the conclusions of Frank and Goyal (2009), Leary and Roberts (2014) etc. Positive association can be explained by the argument of Mudassar, Arshad and Filza (2019) that firms don't formulate their financing policy separately rather they are influenced by their peers. However, the positive association between peer leverage and leverage decisions of corporations are statistically insignificant. So, null hypothesis of this research can't be rejected and hence, there is no peer effects on capital structure decisions.

Contrary to prior studies, this study doesn't find the evidence of peer effects on capital structure. This findings is an

example of variation in the findings of capital structure determinants across countries. Existing literatures (e.g., Bancel and Mittoo, 2004) offer some explanation what causes differences in the determinants of capital structures across countries. When the existing evidence are from developed and developing countries (e.g., USA, China, Italy, Malaysia etc.), this study is from Bangladesh which belongs to least developed countries (LDC) group and expected to get promoted from this group in 2026. As the country and institutional settings vary between existing literatures and this study, differences in the institutional and legal environment arise. Such differences cause variations in the impact of a factor as a determinant of capital structure (Bancel and Mittoo, 2004). As focus of this study is solely on whether peer firms' capital structure influences individual firm's capital structure, we don't delve further into arguing why the study didn't find the evidence of the peer effects, as opposed to existing literatures. This topic may be subject of another study.

Cost of debt exhibits negative association with all measurement of leverage. The finding is statistically insignificant. But the negative association support the postulation of static trade off that cost and advantage of debt financing need to be traded off. The results of this study align with those of Hossain and Hossain (2015). L_Cap exhibits positive association with debt ratio. As the firms grow larger and larger, agency cost associated with debt becomes less prominent. Thus argued by static trade off theory, cost of debt financing gets smaller and firms use more leverage. This findings are consistent with Frank and Goyal (2009), Siddiqui (2012) etc. In contrary to their findings, the coefficient is statistically insignificant. Natural logarithm of age of firms which measures maturity exhibits mixed results with leverage ratios. However, the finding is statistically insignificant. Mixed signs have been found for MV_to_BV ratio which reflects growth opportunities. However, the finding lacks statistical significance.

OCF ratio exhibits significant negative relationship with leverage. 1% increase in the OCF ratio results in 13.7% reduction in TDR and 18.6% reduction in STDR. When a firm generates cash internally, it can use those funds to finance its needs. Thus, the result confirms the presence of pecking order in capital structure decisions of Bangladeshi firms. Tangibility exhibits negative association with TDR and STDR while revealing positive association with long term debt ratio. 1% increase in tangible assets is associated with 19.8% reduction in STDR and the finding is significant at 10% level. Also, 1% changes in tangible assets can explain28.7% changes in LTDR which is significant at 5% level. Usually, tangible assets are collateralized or mortgaged for securing debt with long term maturity while short term loans are issued based on borrowers reputation (in case of overdraft), inventories and other assets. Total liabilities includes many other debts that don't require support from collateral. Thus, the positive association is in line with Lima (2010), Jahan (2014), Sun et al. (2016), Allini et al. (2018) etc.

Asset growth rate exhibits significant positive relationship with debt ratios. 1% increase in assets growth rate is associated with 1.9% increase contribution of debt fund to total capital and 0.7% increase of LTDR. The findings is significant at 5% level. 1% increase in asset growth rate is associated with 1.2% increase in STDR

and the relationship is significant at 10% level. Finally, the findings confirms the outcome of Lima (2010) and Hossain and Hossain (2015). When a firm grows rapidly, its internally generated cash are not enough to meet the need of financings. Hence, they have to borrow from external sources. Current ratio exhibits significant inverse association with TDR at 1% level. 1% increase in current ratio lead to 7.9% reduction total debt ratio and 3.4% reduction in short term debt ratio. The findings provide evidence of pecking order in line with Siddiqui (2012) and Alom (2013).

Debt service capacity exhibits weak positive association with leverage. Firm with more operating income tends to use higher debt level. The findings is contrary to findings of Hossain and Hossain (2015). Finally, profitability, measured by Return on Assets (ROA) exhibits statistically insignificant relationship with leverage ratio. Argued in pecking order theory, profitable firm can retain and reinvest its earnings into business thus reducing need for debt financing. Thus the study confirms concepts of pecking order.

7.0 Conclusion

This study aimed to asses peer effects on capital structure from the perspective of Bangladeshi firms focusing on Food and Allied, Power and Fuel, cement and ceramic sector of DSE from 2014-15 to 2021-22. Key variable of interest is peer pressure measured by median industry leverage in this study. Fixed effect multiple regression analysis finds statistically insignificant impact of peer pressure in all models.

Among control variables, cash generating efficiency and liquidity exhibit statistically significant negative relationship with total leverage (total debt ratio). Growth of firm and debt level moves in the same direction and finding is statistically significant. Operating cash flow ratio, tangibility and liquidity exhibit statistically significant inverse association with STDR while Debt service coverage ratio and assets growth rate exhibits positive association with STDR and the finding is statistically significant. Model 3 reveals tangibility and LTDR moves together. Compared to the companies with less tangible assets, those with more tangible assets debt with longer-term maturity. Assets growth rate is associated with higher debt regardless of the maturity – i.e., in both long as well as short term maturity. The higher cash a firm can generate, the lower level of debt it takes which resembles pecking order theory.

This study brings significant policy implications for the managers and policy makers of firm. In the context of Bangladesh, this study assessed whether capital structure of peer firms, measured by industry median leverage, affects the individual firm's capital structure. The findings confirms, unlike the existing evidence from developed countries, that capital structure decision of a firm is independent of its peers. While deciding on capital structure, managers should focus on firms specific factors i.e., liquidity, growth, quality of assets, cash generating efficiency etc. They should consider prioritizing the strength, opportunities, potential risk, weakness, conditions of firm, strategy of the firm etc. A firm should adjust or balance its leverage solely based on the consideration of its own. Manager shouldn't be bothered about the capital structure of other firms from the industry. Nevertheless, understanding

industry dynamics is crucial as it can shape financing opportunities. Managers should have profound understanding of institutional and legal environments of the country (i.e., rules, custom, quality of institutions etc.) and how the firm is likely to interact with those. To conclude, managers in Bangladesh should emphasize on internal factors rather than being influenced by peers.

Considering the potential limitations of generalizing evidence from the context of other countries and institutional settings, this study lays the ground work for addressing influence of industry peers on capital structures in Bangladesh. Future study can expand the sample and period of time, include addition peer and firm specific factors and incorporate different methodologies. Macroeconomic considerations can be integrated into the analysis.

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