Leverage-Performance Interaction and Strategic Competition in a Product Market: An Empirical Analysis from Pakistan

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Abstract
This research explores a role of competition among rivals in leverage induced product market performance. The employed method of an inquiry is an empirical examination of 207non-financial firms listed on Karachi Stock Exchange over the period 1999-2013. Product market competition is characterized by rivals' response to a strategic move made by a firm and classified into Cournot and Bertrand Competition. A lack of response indicates a competition in strategic substitutes (Cournot), and a response with a similar strategy specifies a competition in strategic complements (Bertrand). The study uses Competitive Strategic Measure (CSM) to identify the type of competition in the examined industries. Consistent with (*Brander & Lewis*, *1986*)*, leverage enhances performance significantly when firms compete in strategic substitutes. The significant role of leverage, however, diminishes in determination of performance in industries where firms compete in strategic complements as predicted in (Dasgupta & Titman, 1998). The results remain qualitatively unchanged when subjected to robustness check. The findings are important extension to the international and indigenous evidence with implications for the real world practicing managers particularly in Pakistan.*
Key words: Leverage, Performance, Strategic Interaction, Cournot Competition, Bertrand Competition

Introduction

Capital structure concerns a mix of different sources of financing to finance a firm. The two major sources of financing are equity and debt. Both sources vary in terms of risk and control. Equity offers more control over a firm but carries a greater degree of variability in its returns. Debt has prior and predetermined claim on a firm's cash flows but offers limited controlling rights (Hillier, Ross, Westerfield, Jaffe, & Jordon, 2010). The literature on capital structure can be analyzed from several dimensions. The most debated strand of literature focuses on relating capital structure to financial stakeholders (shareholders and debt holders). The main line of research under this strand explores value relevance of capital structure through capital market perfections (Modigliani & Miller, 1958), and imperfections such as asymmetric information (Myers & Majluf, 1984), conflict of interest (Jensen & Meckling, 1976; Jensen, 1986; Stulz, 1990) and commonly known differential tax treatment for debt and equity. Till mid-1980s, the overwhelming focus of research remained on implications of financing decisions for financial stakeholders.

Later on, theoretical researchers (e.g. Brander & Lewis, 1986; Maksimovic, 1988; Dasgupta & Titman, 1998) started pondering on the interaction of capital structure and a firm's behavior and strategies in a product market. A product market strategy encompasses output, pricing, entry, exit, and quality decisions among others, which determine the firm's performance in a product market. The theories in this regard conditioned debt-performance interaction on a type of competition firms' face in a product market. Firms compete in strategic substitutes

(Cournot competition) or strategic complements (Bertrand competition) depending on how a firm's decision affects marginal profit of its rivals (Bulow, Geanakoplos, & Klemperer, 1985). Identifying the nature of strategic interaction among firms is indispensable for an empirical investigation of leverage-performance relation and validity of the relevant theories. This method of empirical examination, however, appears to be limited even in the international literature. Partly, the reason is the difficulty in constructing a practical measure to identify the type of competition existing in an industry. Seemingly, literature in Pakistan is limited on the topic. There is hardly a piece of indigenous research that explores a role of competition (Cournot or Bertrand) in gauging the impact leverage has on performance.

This study endeavors to fill the mentioned empirical gap. For this contribution, the study ascertains firms competing either in strategic substitutes or complements. Next, the firms are classified into Cournot and Bertrand samples, accordingly. Estimations are carried out separately for each sample to discover if leverage-performance interaction is different in one sample than in the other as the theories predict. The study reveals strategic interaction among firms as an important determinant of leverage-performance association. The implications of the findings, therefore, extend to practicing managers as well by guiding them on benefit of debt financing in a particular type of competition.

Organization of the paper follows as: Section 1 provides introduction to the topic, section 2 presents review of the literature, and section 3 discusses sampling, data, variables, empirical measure of competition, and methods of estimation. Section 4 discusses the estimation results with section 5 concluding this effort.

Review of Literature

At the outset it seems as if corporate financing decisions have nothing to do with product market decisions. The usual impression is that the two types of decisions involve different departments (Wanzenried, 2003). This impression is intuitive considering initial formulation of capital structure theory in a single-firm setting. Starting from Modigliani and Miller in 1958 till early 1980s, a large number of capital structure optimizing models precludes a possibility of utilizing debt as a strategic tool to influence or more accurately distort rivals' operating and investment choices. Unlike perfect competition, the usual assumption, a duopoly, as the simplest form of oligopolistic competition, presents a framework where the firm's own choices of strategic variables influence and are influenced by rivals' actions (Lyandres, 2006).

Using such a market structure, a seminal contribution comes from (Brander & Lewis, 1986).In their two-stage Cournot competition model, limited liability feature of debt incentivizes a firm to pursue a risky output strategy. It enhances return in a solvent state and deteriorates it in a bankrupt state when creditors own the firm. This increase in variance of profit, through commitment to a large output stance, is optimal for shareholders even if it distorts the firm's overall value optimization problem. Based on this parameterization, the theory shows that a unilateral increase in the firm's output, induced by a higher amount of debt in its capital structure, affects a reaction function of its rival which accommodates by decreasing its own output. Consequently, using financial leverage as a strategic tool, the levered firm increases its own output and gains at expense of its rival in equilibrium.(Maksimovic, 1988) incorporates collusion in the limited liability framework in a multi-period setting. He argues that benefits of collusion shrink to shareholders and accrue to creditors with increase in debt. Resultantly, a deviation from collusive behavior presents a lucrative choice to shareholders. The firm demonstrates aggression in the product market by increasing its output or reducing its price and

gains at the expense of its rivals. (Glazer, 1994) Analyzes collusion in debt maturity framework and reveals that a levered firm still cooperates if debt is due in distant future. With maturity approaching, however, deviation from a soft-play becomes more rewarding thereby inducing aggression to dominate its rivals and gain at their expense.

Apart from competitors as discussed above, theories also document implications of leverage for other product market participants such as customers, employees, and suppliers. Financial distress arising from leverage empowers a firm against its unionized employees. The employees' equilibrium pay-off is lower in liquidation than in a firm as a going-concern. Using liquidation as a threat, a levered firm can derive value by driving down an optimal wage of its unionized employees, secure price concessions from its suppliers, and obtain subsidized financing from a government (Bronars & Deere, 1991; Dasgupta & Sengupta, 1993). Financial distress also causes a firm to enhance its operating efficiency and strategy (Gilson, 1989; Ofek, 1993) and mitigates agency costs of equity via improved governance structure (Jensen, 1989). As a result, production cost reduces for a levered firm.

In all theories presented above, leverage benefits a firm in various manifestations including performance. Reinforcing a disciplining role of debt, (Phillips, 1995) records that operating margins have improved for recapitalizing firms in three industries out of total four. Interestingly, sales reductions have been recorded for the same firms. The explanation for the overall finding lies in financial distress acting as a disciplining measure. Before recapitalization, the firms had agency problems, which lead to output beyond the optimal level. Leveraged recapitalization aligned the interests of managers with those of shareholders, resulting into optimal reduction in output. Thus, losses in sales appear to be managers driven rather than competitors' or customers'. (Fosu, 2013) Supports Phillip's finding by documenting a favorable impact of leverage on firms' performance using South African data. The researcher attributes this finding to reduction in agency problems since South African firms are particularly prone to agency costs of equity due to their ownership structure that does not provide an adequate investor protection (Kantor, 1998). Bringing information asymmetries in perspective for start-up firms (Franck, 2008)produces an empirical evidence of debt leading to superior operating performance. The study shows that debt causes higher profitability and profitability growth for start-ups even though information asymmetries are larger between the start-ups and their lenders due to lack of their credit histories. (Mitani, 2014) analyzes a role of strategic interactions amongst firms to explore leverage-performance relation. As predicted by (Brander & Lewis, 1986) the evidence reports market share gain for levered firms engaged in Cournot competition.

Empirical evidence reveals that leverage also helps firm withstand competition and hurt its rivals in a product market. Busse (2002) unfolds that financially constrained firms have higher tendency to engage in price reductions, toughening the product market competition. Predicting aggressive behavior, as shown in (Brander & Lewis, 1986), the rivals have to accommodate and compromise their market share. Taillard (2008) also reports that rivals fail to take advantage of the unexpected increase in asbestos related liabilities of the firm. Such liabilities are accompanied by favorable restructuring, as predicted by (Jensen, 1989) which ultimately results into superior operating performance for the firm. (Hadlock & Sonti, 2012) demonstrates that an unexpected shock to a liability structure of a firm, in the form of asbestos litigation, act as a bad news for the firm's counterparts as evidenced by their negative stock reaction. The adverse stock reaction stems from shareholders' prediction of the asbestos tainted firm acting aggressively in the product market with enhanced governance mechanism. The debt makes a firm an aggressive competitor is further reinforced by (Phillips & Sertsios, 2013). Their finding shows that

financially distressed firm tends to reduce price in order to increase current market share and reduce quality to decrease current cash outflow. These actions are motivated by a dire need of the distressed firm to meet its obligations and avoid bankruptcy. Surprisingly, however, when bankruptcy is in process, then opposite occurs. That is, the firms attempt to improve quality. The later finding is attributed to an intuition that in bankruptcy interests of managers get aligned with those of creditors, who are anticipated to be new owners in near future. Keener in analyzing an effect of Leverage Buyout (LBO) on competitors, (Grupp, Rauch, Umber, & Walz, 2015) show that LBO results into reduction in revenue growth of LBO firms' rivals. Additionally, this negative effect is magnifying in the size of LBO. LBO firms also respond more aggressively to new entry or expansion from counterparts (Khanna & Tice, 2000).

Contrary to the line of argument presented above, an alternative strand of theoretical and empirical literature exists that portrays leverage as a culprit and detrimental to performance of a firm in a product market. (Titman, 1984) theorizes that customers are concerned about survival of a firm that produces unique or durable products or when a firm's product quality is significant but hard to observe prior to purchase such as prescription drugs. The liquidation of the firm deprives its customers to obtain future post-sale services and hence inflicts a cost upon them. Similarly, a financial distress can cause a firm to lower its product's quality and since it is unobservable prior to purchase, therefore, exposes customers to a risk of purchasing inferior quality at a full price. Customers will pass on these costs to the firm if it faces a threat of financial bankruptcy by demanding a reduction in price. (Maksimovic & Titman, 1991) suggests that financial distress can be equally costly for firms producing non-unique and non-durable goods if they can easily downgrade quality, quality is unobservable prior to purchase and the financial condition of a firm is observable.

Employees also suffer costs if a firm ceases to exist. Highly skilled employees enjoy a stronger bargaining position against financial distressed firm. As a compensation for possible liquidation, employees' share in firm's revenue is an increasing function of a firm's level of debt. Thus, higher the amount of debt, higher is the proportion employees demand and secure in firm's revenue/profit. The ultimate result is lower profitability, higher expenses, and more cash flows diverted to employees, and hence lower value of a firm (Sarig, 1998).Finally, like employees suppliers are also claimants on the firm's cash flows and hence affected by the survival of a firm. These effects are larger when suppliers have made firm's specific investment tailored to specific needs of the firm. To protect themselves against these costs, suppliers will charge higher prices or in the worst case may end business with the firm. For such firms financial distress originating from high leverage is costly (Banerjee, Dasgupta, & Kim, 2004) and explains the low level of leverage observed for some firms in practice even when cheaper financing is available.

Predation effect of debt also offers an interesting view. This extant theoretical literature has sprung from uplifting two important assumptions commonly made in the previous popular work. The first assumption is of perfect capital market, relaxing which permits asymmetric information to exist between a levered firm and its lenders. The second uplifted assumption is of perfect competition, which allows for impact firms can have on one another in a product market. Given this scenario, predatory theory shows that a firm choses leverage in a first-stage to mitigate agency concerns. This also subjects the firm to financial constraints. A financially strong rival, termed as the one with deep pocket or long-purse in the literature, has an incentive to initiate a predatory strategy such as price war to hurt the levered firm's operating performance. Acknowledging a presence of asymmetric information between the levered firm and its lenders, the underperformance deprives the levered firm from future financing in the second-stage even if

it is otherwise an efficient venture. It results into a liquidity constraint becoming even more binding for the levered firm. Consequently, the constrained firm's capability to exploit growth opportunities and invest in other market share building measures is severely compromised. The diminished capability of the constrained firm to withstand competition results into market share gain for the predator at the expense of prey (the constrained firm). Contingent upon the magnitude and duration of drop in price by the rival, even an exit of the levered firm can be induced (Telser, 1966; Poitevin, 1989; Bolton & Scharfstein, 1990; Kanatas & Qi, 2001).

The link between leverage and pricing behavior has been further modeled in (Chevalier & Scharfstein, 1996). The authors isolate markup component of price from its cost component to ensure that pricing behavior of the levered firm is constraint driven rather than cost. They argue that markups are countercyclical. In recession when operating cash flows are already low, a levered firm increases its markup via increase in its price to avoid bankruptcy even at the cost of future market share. Furthermore, the increase in price by the levered firm is more prominent when customers face higher switching costs, and the firm expects to extract less value from its assets in liquidation. Overall, leverage makes a firm less competitive and prompts predation from its rivals. This threat of predation is further increasing in the similarity of products and interdependent investment opportunities shared by the levered firm and its rivals (Chi & Su, 2016).

Producing empirical evidence on a link between debt and performance, (Opler & Titman, 1994) records a market share loss for levered firms producing specialized products or in concentrated industries. It indicates that the market share loss is customers' or competitors' driven. (Campello, 2003) finds the same negative association but only in the industries where rivals are conservatively financed, thus conditioning the effect of leverage on rivals' capital structure. The market share loss by the levered firm is also an inverse function of value assets generate in liquidation (Campello & Fluck, 2006). In an instance of industrial output contraction, leverage has adverse effect on sales growth and operating profitability (Rao, 2009). The negative impact of leverage on performance is also significant for an affiliated firm when its group is highly levered in times of crisis when outside financing is rare and firms have to rely on internal capital market (Kim, 2016).

(Chevalier , 1995b) empirically explores leverage-price interaction and finds that highly levered firms are more likely to exit industry when their less indebted rivals lower price. Supporting their underinvestment in market share hypothesis, Bolton and Scharfstein (1990) also reports inability of LBO firms to cut-down price even when recession has ended. Campello (2003) produces more direct evidence by using markup as a dependent variable instead of price. The study exhibits that all-debt industry has markup 42 percent greater than that charged by zero-debt industry in response to a 1 percent fall in GDP. Combined with Chevalier and Scharfstein's finding, this piece of evidence confirms that a higher price charged by a levered firm is constraint driven rather cost. The purpose is to enhance short-term cash flows at the expense of long-term market share, reinforcing the underinvestment postulation.

Empirical studies have also investigated the link between leverage, competition and predation. (Chevalier, 1995a) shows that leverage weakens LBO firms and hence softens product market competition as evidenced by new entry and expansion by LBO's rivals. Kovenock & Phillips (1997) registers leverage leading to plant closures for a levered firm on one hand, and enhanced investment from its rivals on the other. An exit is not only restricted to inefficient firms. Instead efficient but highly indebted firms are particularly targeted to induce their exit by a systematic reduction in price from less levered counterparts (Khanna & Tice, 2005). Such

predatory threats magnifies in similarity of products and shared future growth opportunities between the levered firm and its rivals. Finally, (Gustafson, Ivanov, & Ritter, 2015) argues that (Busse, 2002)'s and (Phillips & Sertsios, 2013)'s result of debt making a levered firm an aggressive competitor from airline industry are driven by a period of high-idle capacity. For a period characterized by less-idle capacity, the study reveals that leverage softens a levered firm and compels it towards cooperation and tacit collusion.

Research Methodology

Sample

The study utilizes financial data for a span of 15 years ranging from 1999-2013 and obtained from State Bank of Pakistan's (SBP) publication, "Balance Sheet Analysis of Stock Exchange Listed Firms". Till date, SBP is yet to publish a more recent volume. The study focuses only on non-financial sectors which have a formal count of 28 in the country. Applying at least four-firm criteria, following (Opler & Titman, 1994), 4 sectors are dropped which decreases the count to 24. The number of firms in the remaining 24 sectors is counted as 421. The study randomly choses 11 sectors that constitutes 45.8% of the total population in terms of sectors. A firm's selection within a sector requires removing financial distressed firms with negative shareholders' equity for most of the reporting period. In addition, a firm-year observation is deleted if it has a sales growth exceeding 200%, following (Campello, 2006). Applying this sampling criterion, the final sample contains 207 firms, with 2,386 firm-year observations, from the randomly selected 11 sectors which amount to 49.2% of the total population of 421 firms.

Variables

Sales Growth and Leverage

Debt can affect price-setting behavior of a firm which ultimately shapes its competitive position in a product market. That is why; previous research has looked into pricing decisions in relation to leverage. (Campello, 2006), however, argues that a role of debt is comprehensive and may manifest itself into other strategic choices made by a firm such as location or distribution network decisions. Furthermore, the combined effect of such strategic decisions including pricing is reflected in sales growth of a firm. Therefore, this study employs sales growth (SG) as a valid proxy of performance in a product market and constructs it as $(sales - sales_{t-1} / sales_{t-1})$. As a proxy for leverage, empirical research has mainly used two measures. The first one includes standardization of long-term debt. The argument here is only long-term debt represents a true notion of leverage, discarding short-term financing as spontaneous financing from suppliers that arises in a routine course of business rather than a thoughtful choice of managers. The second measure standardizes total debt which includes short-term debt as well. The view here is that not all short-term debt qualifies as spontaneous financing. In fact, short-term bank loans are the primary source of corporate financing in developing countries (Booth, Aivazian, Demirguc-Kunt, & Maksimovic, 2001). Since Pakistan is a developing economy, therefore, this study uses total leverage (LEV), a ratio of total debt to total assets, as a proxy for leverage. In addition, long-term debt divided by total assets (LTLEV) has been employed as proxy of leverage for robustness of the findings reported for total leverage.

Other Explanatory Variables

The study also uses a set of other explanatory variables. Highly profitable firms use less debt since internally generated funds carry little asymmetric information content (Myers &

Majluf, 1984). On the contrary, debt eliminates opportunistic behavior of managers and enhances profitability (Jensen, 1986). Since profitability (PROF) correlates with sales growth on one hand, and with leverage on the other, therefore, it must be accounted for in an empirical design to explore leverage-sales growth interaction. Otherwise, leverage can capture the effect of profitability and disguise the true effect of itself on performance. Similarly, a highly indebted firm is likely to forego even profitable investment opportunities when benefit from such investment largely accrues to creditors (Myers, 1977). On the other hand, investment is expected to result into higher sales growth. Thus, a regression model must incorporate investment (INVST) as an explanatory variable to prevent leverage from assuming an effect of investment in explaining variation in sales growth. Regarding size, larger firms are more resourceful and hence expected to compete better for market share. Larger firms, according to trade-off theory, are less likely to experience financial distress and go bankrupt. Therefore they can assume more debt. Owing to these correlations, the study uses firm's size (SZ) as a separate control variable and measures it as natural log of total assets. Debt induces a firm to charge higher markup in order to enhance its current operating cash flows to avoid bankruptcy. Higher markup implies a higher price which negatively correlates with sales of a firm (Chevalier & Scharfstein, 1996; Campello, 2003). Thus, markup (MUP) qualifies as an explanatory variable and is measured as (sales – cost of goods sold + change in inventories) / (sales + change in inventories), following (Phillips, 1995). Finally, firms bear advertising, selling, general and administrative expenses (ASGA) to appeal to their customers and compete with their rivals. Such efforts are aimed to enhance sales and market share. On the other hand, (Titman & Wessels, 1988) provides correlation between sales efforts and capital structure. Thus, ASGA is included in the model, expected to carry a positive sign and measured as a ratio of sum of all these expenses scaled by sales.

Competitive Strategy Measure (CSM):

A number of theoretical papers, (for e.g. Brander & Lewis, 1986; Maksimovic, 1988), relate leverage with a particular product market outcome in a context of nature of competition amongst firms. Therefore, identification of how firms compete or interact in an industry is the first-step to examine predications made by such authors. Bulow, Geanakoplos, & Klemperer (1985) shows that firms compete in strategic substitutes or strategic complements. A firm's strategic decision affects its own and its' rivals' marginal profit. If the decision decreases competitors' marginal profit, then rivals respond complaisantly by staying put. Rivals, however, respond aggressively with a similar strategy, escalating competition, if the firm's strategic choice increases their marginal profit. Mathematically, this can be characterized by a second partial derivative of a firm profit with respect to its own output and that of its competitor. That is, $\partial^2\pi_f / \partial q_f \partial q_c$. Where π_f denotes a firm's profit and q_f its output (a proxy for its strategy), and q_c its competitor's output (a proxy for competitor's strategy). If the derivative is negative, the competition amongst firms is said to be in strategic substitutes, also termed as Cournot competition. If it is positive, the competition is said to be in strategic complements, also called as Bertrand competition.

The above idea is theoretically appealing and intuitive but still requires an empirical measure to identify a type of interaction amongst firms in a product market. The required empirical measure, known as Competitive Strategy Measure (CSM), was initially developed by (Sundaram, John, & John, 1996), and later on used by (Lyandres, 2006), among others. Sundaram et al.'s (1996) empirical measure, CSM, is the correlation between a firm's marginal profit and its competitors' combined sales. Mathematically, this can be expressed as: CSM = Correlation [$\Delta\pi_f$ / ΔS_f, ΔS_c]. Where $\Delta\pi_r$epresents a change in firm's profit, ΔS_f a change in its

sales, and ΔS_c denotes change in competitors' combined sales. This coefficient of correlation serves as a direct proxy for $\partial^2\pi_f/\partial q_f \partial q_c$. Negative and positive value of the correlation indicates Cournot competition, and Bertrand competition, respectively.

As in (Lyandres, 2006), this study uses a firm's annual operating profit, its annual sales, and combined annual sales of its rivals to compute CSM for each firm in each industry. Finally, a mean-industry CSM is calculated, which is indicative of the type of competition in a product. A negative mean-industry CSM implies Cournot competition, whereas a positive one indicates Bertrand competition. Based on this criterion, 119 firms have been identified as Cournot firms and grouped into Cournot sample. It contains a total of 1,453 firm-year observations. The Bertrand sample contains 88 firms with 933 firm-year observations. These numbers represent final count used in empirical estimations.

A Baseline Regression Model

The study uses panel data, which accumulates time-series observations for each cross-sectional unit. Panel data can be analyzed using a number of regression methods. The important choice to make is between fixed and random effect model. The (Hausman, 1978)specification test guides to make a correct choice between the two. Therefore, all the models estimated in the forthcoming section are based on the Hausman's test results. The functional form of the model follows as:

$$SG_{i,t} = \beta_0 + \beta_1 SZ_{i,t} + \beta_2 INVST_{i,t} + \beta_3 PROF_{i,t} + \beta_4 ASGA_{i,t} + \beta_5 MUP_{i,t-1} + \beta_6 Leverage_{i,t-1\ or\ t-2} + \varepsilon_{i,t} \quad \ldots\ldots(1)$$

All the variables in the equation (1) have been explained above with justification for their inclusion in the equation. It must be noted that leverage can either denote total leverage (LEV), or long-term leverage (LTLEV).Equation (1) has been estimated in model 1 and 2.

Past research identifies a possibility of leverage being an endogenous variable in such regression-settings. As discussed in section (2), a large body of empirical literature report evidence of leverage having an effect on firm's performance. It is also plausible that a particular product market performance leads to high or low leverage. For instance, underperformance in a product market may cause a firm to borrow more to meet its liquidity needs. This two-way relation between performance and capital structure may lead to spurious regression results. As a protection against this danger, the study adopts three remedies.

First, the possibility of endogeneity between leverage and sales growth arises from factors that vary with time and influence all firms operating in an industry. A good example in this regard can be demand conditions (Kovenock & Phillips, 1997). To eliminate the role of such time-varying factors, (Campello, 2006) suggests adjusting leverage for its industry-year mean. Therefore, the study measures leverage as a deviation from industry-year mean in each year. Consequently, model 3 and 4 estimates the following equation:

$$SG_{i,t} = \beta_0 + \beta_1 SZ_{i,t} + \beta_2 INVST_{i,t} + \beta_3 PROF_{i,t} + \beta_4 ASGA_{i,t} + \beta_5 MUP_{i,t-1} + \beta_6 Leveragedeviation_{i,t-1\ or\ t-2} + \varepsilon_{i,t} \quad \ldots\ldots\ldots\ldots(2)$$

Leverage deviation can either represent total leverage deviation (LEVDEV), or long-term leverage deviation (LTLEVDEV). In the last two estimations, the deviation is standardized through z-scores which further address the simultaneity concern. Using z-scores (ZS), estimation 5 and 6 are based on the following equation:

$$SG_{i,t} = \beta_0 + \beta_1 SZ_{i,t} + \beta_2 INVST_{i,t} + \beta_3 PROF_{i,t} + \beta_4 ASGA_{i,t} + \beta_5 MUP_{i,t-1} + \beta_6 ZS_{i,t-1\ or\ t-2} + \varepsilon_{i,t} \quad \ldots\ldots(3)$$

Total leverage and long-term leverage deviations can be converted into Z scores, and denoted by ZSLEV, and ZSLTLEV, respectively.

Second, the potential for simultaneity is also reduced when leverage is based on book values rather than market values. A capital market's assessment of lower future sales growth decreases market value of equity, and correspondingly increases market value of debt. Book leverage is largely immune from such capital market assessments (Opler & Titman, 1994). The study also employs a book measure of leverage in all 6 estimations. Finally, *exante* choice of leverage reduces the chances of reverse causality running from sales growth to leverage. Therefore, as shown in all three equations, leverage in all its forms is lagged one or two periods, following a common empirical practice.

Empirical Findings

Summary Statistics

This research is mainly focused on examining the role of product market competition in leverage-performance interaction. Thus, as a first step, identification of a particular type of competition in an industry is warranted. The competition is gauged through Competitive Strategy Measure (CSM). Table 1 reports CSM for all industries included in the sample. The most important column in the table is the fourth one. It records the mean CSM. The mean identifies the nature of competitive environment existing in an industry. Specifically, a competition is said to be in strategic substitutes (Cournot competition) if $\partial^2\pi_f/\partial q_f \partial q_c < 0$ as discussed in the previous section. Similarly, a competition is said to be in strategic complements (Bertrand competition) if $\partial^2\pi_f/\partial q_f \partial q_c > 0$. The former condition is equivalent to mean CSM being negative. The later condition meets when mean CSM is positive. Accordingly, five industries have been identified where competitors compete in strategic substitutes. These industries are textile spinning, sugar, automobile assemblers, glass & ceramics, and finally textile weaving. In the remaining six industries, the firms compete in strategic complements. These industries include chemical, cable & electrical goods, fertilizer, textile composite, technology & communication, and finally food & personal care products. It is worth mentioning that a distribution of mean CSM found in (Sundaram *et al*., 1996) ranges from -0.21 to 0.19. The rest of their mean CSM values fall within these two extremes. The distribution of mean CSM found in this research ranges from -0.18 to 0.18. Thus, the two distributions appear to resemble.

Table 1: Descriptive Statistics of Competitive Strategy Measure (CSM) based on Industries

Industry	# of Firms	Obs.	Mean	Min	Max	Std.Dev.
Textile Spinning	66	941	-0.02	-0.76	0.73	0.28
Textile Weaving	6	88	-0.02	-0.46	0.3	0.24
Textile Composite	27	386	0.02	-0.37	0.51	0.19
Sugar	29	432	-0.18	-0.87	0.33	0.32
Automobile Assemblers	13	194	-0.16	-0.55	0.26	0.23
Cable & Electrical Goods	6	89	0.07	-0.06	0.27	0.12
Technology & Communication	8	108	0.18	-0.14	0.96	0.36

Fertilizers	5	73	0.15	-0.003	0.29	0.11
Chemical	26	377	0.02	-0.57	0.85	0.36
Food & Personal Care Products	16	231	0.07	-0.29	0.64	0.27
Glass & Ceramics	9	134	-0.11	-0.7	0.55	0.4

The first column presents names of industries included in the sample. The second and third columns report number of firms and number of observations used to compute CSM. The columns four through seven presents descriptive statistics for CSM. A negative and positive mean CSM indicate Cournot, and Bertrand competition, respectively.

As previously stated, the basic postulation in this research rests on the notion that competitive environment in which firms operate matter. If it does matter, then there is potential for Cournot and Bertrand firms to differ in terms of various characteristics such as size, profitability, investment, leverage etc. An empirical examination of these potential differences between the two types of firms is highly desirable. The comparison has been drawn and presented in table 2 between the two types of competitions. Due to its primary importance, a comparison is drawn first for leverage.

The mean total leverage for Cournot firms and Bertrand firms is 0.635 and 0.551, respectively. It exhibits that the former firms are more indebted as compared to the later. Precisely, the Cournot firms carry total debt greater by 0.084 or 8.4% than Bertrand firms as shown in column 6 titled "Difference". This difference of 8.4% can either be statistically significant or merely a result of sampling error and will disappear if another sample is chosen. To ensure that the difference is not emanating from sampling error, the null hypothesis is tested. The null states that the mean total leverage is same under both Cournot and Bertrand competition. That is, the difference between the two means is equal to zero. The p-value under column titled "≠0" is 0.0000, suggesting that the null of no difference can be safely rejected. Furthermore, the p-value under column titled "<0" proposes that the difference cannot be less than zero. Finally, the p-value for the difference greater than zero, reported under column titled ">0", concludes that total debt assumed in Cournot competition is greater than that assumed in Bertrand competition, and the difference has not occurred by chance due to sampling error and is statistically significant. Moreover, the same finding is revealed for long-term and short-term leverage in the table. That is, an employment of long-term and short-term debt is statistically significantly higher when firms compete in strategic substitutes than when they compete in strategic complements. To preserve space, a detailed discussion of rest of the variables is omitted since they can be interpreted in the similar manner. Only highlights of the comparison are presented.

The Cournot firms are different from the Bertrand firms in terms of size, investment, and profitability. The Bertrand firms are larger in size and are more profitable, whereas the Cournot firms invest more, and these differences are statistically significant. Similarly, Bertrand firms charge higher markups, and spend more on ASGA expenses, and the differences are again statistically significant, even though the statistical significance has slightly deteriorated for these two. Interestingly, there is no difference between the two types of competitions when it comes to sales growth. A typical sales growth is 15.3% for Cournot firms, and 14.7% for Bertrand firms, but the difference of 0.6% is not statistically significant. Thus, a typical firm in either type of competition enhances its sales at the same pace. To conclude, there are remarkable differences between the two competitive environments, in particular with respect to total, long-term, and short-term leverage – the variable of the main focus, and therefore, a rigorous regression analysis is warranted to gain deep insight into the issue.

Table 2: Summary Statistics and Hypothesis Testing for Cournot and Bertrand Samples

	Cournot Competition Obs. = 1453		**Bertrand Competition Obs. = 933**		**Cournot - Bertrand**		**P-Value**		
Variables	**Mean**	**Std.Dev.**	**Mean**	**Std.Dev.**	**Difference**	**t-stat**	**<0**	**≠0**	**>0**
SG	0.153	0.363	0.147	0.303	0.006	0.4196	0.6626	0.6748	0.3374
SZ	14.108	1.042	14.531	1.749	-0.423	-7.3986	0.0000	0.0000	1.0000
INVST	0.081	0.17	0.066	0.139	0.015	2.2543	0.9879	0.0243	0.0121
PROF	0.125	0.121	0.152	0.138	-0.027	-5.0313	0.0000	0.0000	1.0000
ASGA	0.094	0.976	0.146	0.347	-0.052	-1.565	0.0589	0.1177	0.9411
MUP	0.028	2.608	0.168	0.658	-0.14	-1.3967	0.0813	0.1627	0.9187
LEV	0.635	0.177	0.551	0.183	0.084	11.1627	1.0000	0.0000	0.0000
LTLEV	0.174	0.141	0.131	0.132	0.043	7.4516	1.0000	0.0000	0.0000
STLEV	0.462	0.164	0.42	0.169	0.042	6.0319	1.0000	0.0000	0.0000
LEVDEV	-0.036	0.172	-0.023	0.172	-0.013	-1.8016	0.0359	0.0717	0.9641
LTLEVDEV	-0.013	0.127	-0.004	0.12	-0.009	-1.7257	0.0423	0.0845	0.9577
STLEVDEV	-0.024	0.156	-0.019	0.156	-0.005	-0.764	0.2225	0.445	0.7775
ZSLEV	-0.132	0.811	-0.094	0.865	-0.038	-1.088	0.1384	0.2767	0.8616
ZSLTLEV	-0.071	0.894	-0.029	0.929	-0.042	-1.1027	0.1351	0.2702	0.8649
ZSSTLEV	-0.105	0.849	-0.079	0.868	-0.026	-0.7236	0.2347	0.4694	0.7653

The first column reports variables as discussed in the section III. The second and third columns provide mean and standard deviation for each variable in Cournot competition, respectively. The fourth and fifth columns present the same but in Bertrand competition. The sixth column offers the difference between the means under both competitions. The seventh column reports the t-statistic for each difference. The columns eight, nine, and ten presents p-values for statistical significance of the difference between the means of each variable under the two types of competition.

Estimation Results:

This section provides a rigorous regression analysis based on equation 1 through 3 given earlier. Table 3 reports estimation results for firms competing in strategic substitutes. The table presents results for total leverage (LEV), measured as a ratio of a sum of long-term and short-term debt to total assets. Total leverage has been used since Pakistan is a developing economy where long-debt market is not well- established and the firms tend to rely on short-term bank loans. The first 2 models are based on equation 1. Regression results obtained through equation 2 are shown in model 3 and 4. Finally, the last two models have been estimated using equation 3. Sales growth (SG), as a proxy of performance, is the dependent variable in all 6 models. Each model differs from another in terms of either a form of leverage or its lag structure.

The regression outputs presented in the table offer two major types of information. First, each regression output shed light on a model as a whole. The statistic involve here is R squared, presented at three distinct levels and explains the overall explanatory power of each model. The within R squared stems from variation within each cross-sectional unit (firm) overtime, whereas

Table 3: Regression Results of Total Leverage for Cournot Competition

Regression of Total Leverage - Cournot Competition

VARIABLES	(1) SG	(2) SG	(3) SG	(4) SG	(5) SG	(6) SG
SZ	0.021**	0.022*	0.019*	0.020*	0.017	0.018
	(0.0491)	(0.0578)	(0.0880)	(0.0978)	(0.1345)	(0.1237)
INVST	0.305***	0.332***	0.307***	0.336***	0.313***	0.340***
	(0.0024)	(0.0009)	(0.0022)	(0.0009)	(0.0018)	(0.0008)
PROF	0.941***	0.907***	0.935***	0.904***	0.928***	0.905***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
ASGA	0.030	0.034	0.029	0.033	0.029	0.034
	(0.1518)	(0.1114)	(0.1678)	(0.1188)	(0.1628)	(0.1120)
MUP_{t-1}	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV_{t-1}	0.275***					
	(0.0000)					
LEV_{t-2}		0.224***				
		(0.0000)				
$LEVDEV_{t-1}$			0.272***			
			(0.0000)			
$LEVDEV_{t-2}$				0.150***		
				(0.0065)		
$ZSLEV_{t-1}$					0.050***	
					(0.0000)	
$ZSLEV_{t-2}$						0.028**
						(0.0141)
CONST	-0.466***	-0.440***	-0.238	-0.253	-0.212	-0.238
	(0.0031)	(0.0084)	(0.1094)	(0.1174)	(0.1642)	(0.1462)
r2_w	0.0899	0.0908	0.0875	0.0836	0.0869	0.0838
r2_b	0.412	0.224	0.418	0.212	0.405	0.206
r2_o	0.116	0.112	0.114	0.105	0.112	0.105

Robust pval in parentheses

*** p<0.01, ** p<0.05, * p<0.10

The estimation results are for total leverage (LEV) in Cournot competition and are based on equations 1 through 3. All estimations have been corrected for heteroskedasticity across firms and the serial correlation in the error term overtime. Sales growth (SG) is an annual growth in sales, defined as ($Sales_t$-$sales_{t-1}$)/$sales_{t-1}$. Size (SZ) is the natural log of total assets. Investment (INVST) is capital expenditure scaled by total assets. Profitability (PROF) is earnings before financial expenses and taxes plus depreciation divided by total assets. ASGA represents a sum of advertising, selling, general, and administrative expenses scaled by total sales. Markup (MUP) is the sum of gross profit and change in inventories divided by sum of sales and change in inventories. Total leverage (LEV) represents total debt divided by total assets. Total leverage is based on book values. The first model uses total leverage lagged one period. The second model also uses total leverage but lagged two periods. The third model employs a deviation of total leverage from its industry-year mean leverage and lagged one period. The fourth model also involves the same deviation but lagged two periods. The fifth model standardizes the total leverage deviations and converts them into zscores. It then utilizes one period lag of the zscores. Finally, the sixth model contains the zscores lagged two periods. The choice of panel data model is guided by the (Hausman, 1978) *specification test. The sample period ranges from 1999-2013. The data have been obtained from the publication of State Bank of Pakistan (SBP), Balance Sheet Analysis of Stock Exchange Listed Firms.*

the between R squared takes into account the variation caused in the dependent variable (sales growth) by deviation of each cross-sectional unit's mean from the global mean. The overall R squared reflects the combination of the two components, that is, within and between R squared. The value of R squared is approximately 11 % in each model, suggesting that each model has a considerable explanatory power, and is not less than the one reported in the similar literature.

Second, the regression results portray statistical and economic significance of the explanatory variables contained in each model. The discussion of the explanatory variables starts here with leverage since this study is mainly focused on leverage-performance interaction. The model 1 exhibits the largest economic significance of total leverage among all models. Precisely, the model shows that a 1% increase in total leverage causes sales growth to rise by 27.5% next period, keeping other variables constant. The economic significance of total leverage is also accompanied by its statistical significance. The null hypothesis of total leverage having no effect on sales growth next period can be safely rejected even at 1% level of significance. As a result, the coefficient obtained for the sample under model 1 can be generalized to the entire population of at least domestic firms listed on Karachi Stock Exchange that compete in strategic substitutes. The influence of leverage on sales growth does not reduce substantially when leverage is lagged 2 periods back as shown in the model 2. A 1% inclination in leverage still increases sales growth by 22.4% in the second year of the rise in leverage. The statistical significance also still holds even at 1% level of significance.

Total leverage is also significant when adjusted for industry-year mean and lagged one period as demonstrated in model 3. The coefficient still appears to be substantial and can now be interpreted in comparison with average firm. A 1% increase in total leverage as compared to industry-year mean leverage results into better sales performance by 27.2% next period. This outcome is also statistically significant. The coefficient reduces to 0.15 or 15% in model 4 when total leverage deviation is lagged two periods. Nonetheless, the statistical significance is not compromised.

Finally, Model 5 and 6 converts total leverage deviations to z scores and the coefficients are now stated in terms of standard deviations and can be interpreted accordingly. Model 5 reveals that a 1 standard deviation increase in total debt financing of assets, as compared to average industry rival, improves sales growth by 5% next period. This effect, however, reduces to 2.8% when lagged two periods in model 6. Still, the effect of total leverage is statistically significant in both models.

To sum up, the influence of total leverage on performance is considerable and statistically significant in all 6 models. The picture that emerges so far reflects performance relevance of total leverage in Cournot competition. Precisely, increasing total debt in capital structure boosts product market performance of firms when they compete in strategic substitutes. The finding lends a robust support to prediction of (Brander & Lewis, 1986). It is important to emphasize that Cournot competition is characterized by an unmatched rival's response to a firm's aggressive strategic move. Mathematical expression for Cournot competition is $\partial^2\pi_f / \partial q_f \partial q_c < 0$, where π_f denotes a firm's profit and q_f its output (a proxy for its strategy), and q_c its competitor's output (a proxy for competitor's strategy). Consistent with the finding of this study, a limited liability feature of debt prompts a firm to commit itself to a larger output stance. Since rivals' marginal profit, in Cournot competition, is decreasing in the firm's strategy, therefore, they stay put, and accommodate the firm's enhancement in production by retrenching their own. Consequently, the levered firm gains at the expense of its rivals as evident from the outperformance of a more levered firm found in this study.

Next, the role of leverage is inquired when firms compete in strategic complements. The idea here is, if type of competition does matter, then leverage-performance interaction should alter in Bertrand competition from what has been found above in Cournot competition. To this end, table 4 reports the same 6 models as recorded above but for the firms engaged in Bertrand competition. The table reveals remarkable differences with the table 3. When firms compete in

strategic substitutes, table 3 shows that total leverage is statistically significant in all 6 models no matter total leverage is used in any form and in any lag structure. This is a very robust finding demonstrating a strong influence of total leverage in determining product market performance when Cournot competition exists in an industry. On the contrary, total leverage fails to explain significant variation in performance under Bertrand settings as reflected in table 4. This is evidenced by total leverage being statistically insignificant in all 6 models at 5% level of significance, and statistically significant only in 2 models at 10% level of significance. The explanation for very limited role of leverage when firms compete in strategic complements can be sought from (Dasgupta & Titman, 1998). They argue that leverage induces a Bertrand competing firm to increase its price. Since price is a strategic complement (Bulow, Geanakoplos, & Klemperer, 1985), therefore, rivals respond with the similar increase. As a result, neither the firm nor its rivals capture additional market share. The ultimate conclusion is no significant effect of leverage on performance as unfolded in this research. The findings from Cournot and

Table 4: Regression Results of Total Leverage for Bertrand Competition

Regression of Total Leverage - Bertrand Competition

VARIABLES	(1) SG	(2) SG	(3) SG	(4) SG	(5) SG	(6) SG
SZ	-0.020	-0.012	-0.017	-0.009	-0.017	-0.009
	(0.4853)	(0.6791)	(0.5508)	(0.7648)	(0.5451)	(0.7618)
INVST	0.436***	0.458***	0.439***	0.456***	0.439***	0.458***
	(0.0004)	(0.0002)	(0.0003)	(0.0002)	(0.0003)	(0.0002)
PROF	0.642***	0.642***	0.650***	0.646***	0.657***	0.648***
	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
ASGA	-0.056	-0.072	-0.054	-0.072	-0.053	-0.071
	(0.5493)	(0.4554)	(0.5611)	(0.4583)	(0.5645)	(0.4588)
MUP_{t-1}	-0.167	-0.130	-0.167	-0.131	-0.164	-0.130
	(0.2656)	(0.4137)	(0.2660)	(0.4142)	(0.2762)	(0.4204)
LEV_{t-1}	0.228*					
	(0.0719)					
LEV_{t-2}		0.198*				
		(0.0601)				
$LEVDEV_{t-1}$			0.194			
			(0.1394)			
$LEVDEV_{t-2}$				0.160		
				(0.1392)		
$ZSLEV_{t-1}$					0.039	
					(0.1166)	
$ZSLEV_{t-2}$						0.033
						(0.1346)
CONST	0.229	0.120	0.314	0.186	0.314	0.187
	(0.5837)	(0.7723)	(0.4508)	(0.6589)	(0.4477)	(0.6574)
r2_w	0.122	0.123	0.120	0.121	0.120	0.122
r2_b	0.0210	0.0155	0.0255	0.0233	0.0243	0.0234
r2_o	0.0963	0.0975	0.0988	0.100	0.0974	0.0998

Robust pval in parentheses

*** p<0.01, ** p<0.05, * p<0.10

The estimation results are for total leverage (LEV) inBertrand competition and are based on equations 1 through 3. All estimations have been corrected for heteroskedasticity across firms and the serial correlation in the error term overtime. Sales growth (SG) is an annual growth in sales, defined as $(Sales_t\text{-}sales_{t-1})/sales_{t-1}$. *Size (SZ) is the natural log of total assets. Investment (INVST) is capital expenditure scaled by total assets. Profitability (PROF) is earnings before financial expenses and taxes plus depreciation divided by total assets. ASGA represents a sum of advertising, selling, general, and administrative expenses scaled by total sales. Markup (MUP) is the sum of gross profit and change in*

inventories divided by sum of sales and change in inventories. Total leverage (LEV) represents total debt divided by total assets. Total leverage is based on book values. The first model uses total leverage lagged one period. The second model also uses total leverage but lagged two periods. The third model employs a deviation of total leverage from its industry-year mean leverage and lagged one period. The fourth model also involves the same deviation but lagged two periods. The fifth model standardizes the total leverage deviations and converts them into zscores. It then utilizes one period lag of the zscores. Finally, the sixth model contains the zscores lagged two periods. The choice of panel data model is guided by the (Hausman, 1978) *specification test. The sample period ranges from 1999-2013. The data have been obtained from the publication of State Bank of Pakistan (SBP), Balance Sheet Analysis of Stock Exchange Listed Firms.*

Bertrand competitions establish that leverage-performance outcome is competition contingent in a product market, and ignoring it will produce a misleading conclusion for leverage effect on performance.

Before winding up, a cursory glance at other explanatory variables is appropriate. There are number of similarities between other explanatory variables in both types of competitions. Investment and profit both carry positive influence on performance and are statistically significant under Cournot and Bertrand competition as anticipated. Similarly, ASGA is statistically insignificant irrespective of firms either competing in strategic substitutes or complements. Size is marginally significant under Cournot competition and insignificant under Bertrand competition. Markup appears to be a more interesting case and requires a deeper explanation for different effect. In both competitions, markup carries negative coefficients in all estimated models. The negative coefficients show that increasing markup reflects a higher cost for customers, and therefore, it should consequently lead to a lower sales growth for the firm. The statistical significance, however, varies in both types of competitions. Specifically, markup is statistically significant only in Cournot competition. The significance disappears in Bertrand competition. The difference in significance for two types of competition has plausible explanation. Cournot competition is characterized by a lack of response to a move made by a firm. Thus, when a Cournot competing firm increases its markup, it remains unmatched up by its rivals. Consequently, the markup increasing firm loses sales to its counterparts, establishing a negative relation between sales growth and markup. On the other hand, rivals respond with the same reaction to an action taken by the firm in a Bertrand competition. Thus, when a Bertrand competing firm enhances its markup, the rival catches up by increasing their markups too. The ultimate conclusion is neither firm gains nor loses sales, establishing an insignificant relation between performance and markup in Bertrand competition.

Robustness of the Results

The study undertakes two types of robustness checks. First, the results provided in table 3 and 4 employ 6 different estimations for each type of competition with different forms of leverage and lag structures. The signs and statistical significance of the coefficients of total leverage remain consistent for all 6 estimations in table 2, indicating a robustness of the result for Cournot competition. Similarly, total leverage is largely statistically insignificant in table 4, indicating a robustness of the results for Bertrand competition. More specifically, total leverage is insignificant in all 6 models at 5% level of significance when firms compete in strategic complements.

Second, a use of long-term leverage (LTLEV) in estimations provides an opportunity to strengthen the above reported findings. Long-term debt represents a true capital structure decision since it reflects a management's thoughtful and deliberate choice as a source of financing a firm's assets. In the context of this study, long-term leverage affects a firm behavior and commits it to a particular output stance or pricing conduct in a product market. Given this scenario, if the results reported above for total leverage in Cournot competition are valid, then estimations involving long-term leverage in Cournot competition must reconcile to that of total

leverage presented in table 3. Table 5, given below, produces estimation results for long-term leverage.

Comparison of estimation results for total leverage, and long-term leverage in table 3, and 5, respectively, reveals expected pattern. Long-term leverage has positive and significant association with performance in all 6 estimations. It reinforces the finding that sales growth gains reported for total leverage in table 3 are indeed driven by debt committing a firm to large output stance with rivals limiting their own output.

Table 5: Regression Results of Long-Term Leverage for Cournot Competition

Regression of Long-Term Leverage - Cournot Competition

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	SG	SG	SG	SG	SG	SG
SZ	0.023**	0.019	0.019	0.019	0.018	0.018
	(0.0441)	(0.1024)	(0.1117)	(0.1206)	(0.1306)	(0.1369)
INVST	0.333***	0.354***	0.338***	0.352***	0.342***	0.353***
	(0.0013)	(0.0005)	(0.0009)	(0.0005)	(0.0009)	(0.0005)
PROF	0.876***	0.892***	0.881***	0.896***	0.879***	0.893***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
ASGA	0.031	0.035	0.031	0.035	0.031	0.035
	(0.1552)	(0.1074)	(0.1426)	(0.1042)	(0.1404)	(0.1031)
MUP_{t-1}	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
$LTLEV_{t-1}$	0.325***					
	(0.0000)					
$LTLEV_{t-2}$		0.181**				
		(0.0193)				
$LTLEVDEV_{t-1}$			0.200**			
			(0.0114)			
$LTLEVDEV_{t-2}$				0.192**		
				(0.0313)		
$ZSLTLEV_{t-1}$					0.023**	
					(0.0458)	
$ZSLTLEV_{t-2}$						0.021*
						(0.0710)
CONST	-0.358**	-0.288*	-0.239	-0.243	-0.226	-0.233
	(0.0217)	(0.0809)	(0.1375)	(0.1416)	(0.1595)	(0.1607)
r2_w	0.0912	0.0851	0.0816	0.0864	0.0806	0.0852
r2_b	0.404	0.199	0.376	0.186	0.371	0.184
r2_o	0.115	0.105	0.104	0.104	0.103	0.103

Robust pval in parentheses

*** p<0.01, ** p<0.05, * p<0.10

The estimation results are for long-term Leverage (LTLEV) in Cournot competition and are based on equations 1 through 3. All estimations have been corrected for heteroskedasticity across firms and the serial correlation in the error term overtime. Sales growth (SG) is an annual growth in sales, defined as ($Sales_t$-$sales_{t-1}$)/$sales_{t-1}$. Size (SZ) is the natural log of total assets. Investment (INVST) is capital expenditure scaled by total assets. Profitability (PROF) is earnings before financial expenses and taxes plus depreciation divided by total assets. ASGA represents a sum of advertising, selling, general, and administrative expenses scaled by total sales. Markup (MUP) is the sum of gross profit and change in inventories divided by sum of sales and change in inventories. Total leverage (LEV) represents total debt divided by total assets. Total leverage is based on book values. The first model uses total leverage lagged one period. The second model also uses total leverage but lagged two periods. The third model employs a deviation of total leverage from its industry-year mean leverage and lagged one period. The fourth model also involves the same deviation but lagged two periods. The fifth model standardizes the total leverage deviations and converts them into zscores. It then utilizes one period lag of the zscores. Finally, the sixth model contains the zscores lagged two periods. The choice of panel data model is guided by the (Hausman, 1978) *specification test. The sample period ranges from 1999-2013. The data have been obtained from the publication of State Bank of Pakistan (SBP), Balance Sheet Analysis of Stock Exchange Listed Firms.*

Conclusion

Apart from (Modigliani & Miller, 1958), theories establish a linkage between capital structure and a firm's performance. Empirical studies reinforce an impact capital structure has on performance, often with contradictory results. That is, some studies register a positive role of leverage in performance, while others find debt as a detrimental to a success of a firm. An explanation for the contradiction can be at least partly sought from the way firms engage in competition in their respective industries. International empirical studies have largely overlooked the role of strategic competition. An attention to strategic interaction among firms in a product market is almost absent in the indigenous empirical studies. This study attempts to fill the void through recognition that performance outcome of leverage may possibly be contingent upon a competition existing in a product market.

To this end, the study uses data for the period of 1999 to 2013 examining a sample of 207 non-financial listed firms. The study is first of its kind in Pakistan to determine performance outcome of leverage conditioned on the strategic interaction among firms in a product market. As a first step, an empirical measure, CSM, is computed to establish if the examined firms compete in strategic substitutes or complements. Firms are grouped into Cournot sample if mean-industry CSM = Correlation $[\Delta\pi_f / \Delta S_f, \Delta S_c] < 0$ and into Bertrand sample if the mean CSM = Correlation $[\Delta\pi_f / \Delta S_f, \Delta S_c] > 0$, where $\Delta\pi_f$ represents a change in firm's profit, ΔS_f a change in its sales, and ΔS_c denotes change in competitors' combined sales. This coefficient of correlation serves as a direct proxy for $\partial^2\pi_f/\partial q_f \partial q_c$ (Sundaram, John, & John, 1996). Finally, a Cournot sample and Bertrand sample of 1,453 and 933 firm-year observations are obtained, respectively, after deletion of observations with sales growth greater than 2, and leverage exceeding 1. Furthermore, 6 estimations are carried out for each sample.

Consistent with (Brander & Lewis, 1986), all estimations for Cournot sample reveal outperformance of rivals by a levered firm. The Cournot sample includes five industries, namely: automobile assemblers, glass and ceramics, sugar, textile spinning, and textile weaving from Pakistan. Due to limited liability feature of debt, debt acquisition encourages a firm to commit itself to a higher output stance. Since Cournot competition is characterized by a lack of response from rivals, therefore, the levered firm experiences an expansion in its sales at the cost of its rivals. Thus, in the mentioned Pakistani industries, leverage brings about positive product market performance and implies a preference of debt over equity for practicing managers. No such evidence is observed for Bertrand sample, as predicted in (Dasgupta & Titman, 1998). That is, leverage has no significant effect on product market performance when firms compete in strategic complements. The Bertrand sample includes 6 Pakistani industries, namely: fertilizers, food and personal care products, technology and communication, cable and electrical goods, chemical and textile composite. Since competition in these industries is marked by same response from rivals, therefore, leverage does not result into a significant performance outcome. The ultimate suggestion for managers is to rely less on debt since it may bring financial distress without accompanying product market advantage. These results are robust to using different measures of leverage and lag structures. To sum up, the study establishes an integral role for type of competition in leverage-performance interaction.

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