

Capital Structure and Firm Efficiency : A Case of Pakistan

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Abstract

This study investigated the effect of capital structure on firm performance using the agency cost hypothesis and reverse causality hypothesis. For the firms listed on the Karachi Stock Exchange under the textile industry, from 2008-2012, data envelopment analysis (DEA) was used to construct a frontier to measure firm efficiency. Efficiency risk hypothesis and franchise value hypothesis were tested to find out the effects between efficiency and leverage. The results suggested that ownership structure and leverage had a positive relationship (efficiency risk hypothesis) between them. The agency cost hypothesis supported the positive effect of leverage on efficiency. Convergence of interest, that is, concentrated ownership, had a positive effect on firm performance.

Keywords: capital structure, ownership structure, leverage, DEA, agency cost, firm efficiency

JEL Classification: D24, G3, G32, L6

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Capital structure, the way a company finances itself by combining long term debt, specific short-term debt and equity, is one of the most important themes in corporate finance (Jothi, 2010). A company uses different sources of funds to finance its operations that, in turn, affect the growth of a company. Combination of debt and equity in different proportions attempt to increase the market value of a firm (Rafiq, Iqbal, & Atiq, 2008). Age of a company, growth, ownership structure, and size are the main factors influencing the capital structure (Sheikh & Wang, 2011; Viviani, 2008).

Existence of different factors result in different capital structures among the firms from developed and developing countries (Rashid, Islam, & Nuryanah, 2014). Authors have found mixed evidences on the relationship between capital structure and firm performance. Nerlove (1968), Petersen and Rajan (1994), Huchtinson and Hunter (1995), Altan and Arkan (2011), and Ben Moussa and Chichti (2011) found a negative relationship between capital structure and firm performance. Others showed that debt has a positive affect on the

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value of a firm (Berger & Bonaccorsi di Patti, 2006; Fama & French, 1998; Gleason, Mathur, & Mathur, 2000; Majumdar & Chhibber, 1999; Rashid et al., 2014). In his study on the primary aluminum industry from India, Amsaveni (2009) discussed the role of capital structure on the profitability of the firms and how the right mix of debt and equity in its capital structure will increase a firm's profitability.

Using the genetic algorithm model on the listed firms in Pakistan, Afrasiabishani, Ahmadinia, and Hesami (2012) showed that long term debt is positively related to firm performance. Manufacturing firms of Pakistan with higher profit, more liquid resources, and those that have potentiality for growth tend to borrow less (Sheikh & Wang, 2011; Yasmin & Imad, 2012). These firms prefer more financial flexibility and thus choose less restricted debt. The profitable firms from the chemical sector of Pakistan also showed the same trend (as observed by Rafiq et al., 2008).

This study focuses on the relationship between capital structure and firm efficiency of 50 textile companies listed on the Karachi Stock Exchange and uses the agency cost hypothesis and reverse causality hypothesis to examine the relationship. Jensen and Meckling's (1976) agency cost hypothesis suggested leverage as a disciplinary device to lessen agency cost of external ownership. Reverse causality hypothesis tests the relationship between efficiency and leverage through two bi-directional hypotheses- franchise value hypothesis and efficient risk hypothesis. Data envelopment analysis (DEA) technique is used to measure firm efficiency as a proxy for firm performance. Partial contracts, poor motivation, and differences between owner's and manager's goals lead to firm inefficiency. This paper measures firm efficiency as the difference between firms' potential and actual output.

The evidences from this paper - the relationship between equity, capital structure, and firms' performance of Pakistani textile companies will enhance the understanding of the relationship in an economy, where perfect market conditions were allowed to act through financial sector reforms. Secondly, conventional productivity and financial performance measures are not used in this study; rather, it adopted data envelopment analysis (DEA) approach to estimate the technical efficiency. This study is a pioneer in using the DEA approach to measure the relationship between capital structure, ownership, and firm performance for the listed firms in Pakistan.

Literature Review

The manager's role is vital in making decisions on financing as they have to decide when, where, and how to acquire funds to meet the investment needs of a firm (Jothi, 2010). The theory of corporate governance revolves around the conflicts between managers and shareholders and also between minority and controlling shareholders (Jensen & Meckling, 1976; Shleifer & Vishny, 1986). A number of researchers have discussed the effects of ownership structure on corporate performance (Afza & Mirza, 2010 ; Berle & Means, 1932; Demsetz & Villalonga, 2001; Jensen & Meckling, 1976; King & Santor, 2008; Villalonga & Amit, 2006) as well as the effects of capital structure on corporate performance (Harris & Raviv, 1991; Myers, 2001). Very few have focused on the combined effects that the capital and ownership structure have on firm performance (Mahrt-Smith, 2005).

(1) Capital Structure and Firms' Performance : The basis of the agency cost theory is that the interests of the shareholders and managers are not aligned. Jensen and Meckling (1976) highlighted the agency cost of equity and explained its importance and issues that arose from the separation of control and ownership. The firm performance is positively affected by the optimal selection of the capital structure. In most of the cases, agency conflict arises when managers try to maximize personal benefits, drifting away from a firm's goal. In 'free cash flow theory,' Jensen (1986) explained the ways to motivate managers to invest in profitable projects to maximize a firm's wealth. To restrain managers from improper usage of funds, the debt ratio can be used as a controlling measure (Jensen, 1986; Stulz, 1990). The threat of liquidation creates fear amongst the managers as their jobs, salaries, and reputation are at stake in case of liquidation. Thus, managers can be pressurized to work for the benefit of a firm; this will reduce the possibility of over- or suboptimal investments (Jensen, 1986; Williams, 1987).

On the other hand, conflicts between debt and equity investors also create agency costs because of the risk of default related to higher debt. Myers (1977) termed it as “debt overhangs” or “underinvestment” problem. In this case, debt has a negative effect on the value of a firm. Myers (1977), Jensen (1986), and Stulz (1990) argued that debt financing lessens the overinvestment while worsening the underinvestment issues. They further argued that debt can have both positive as well as negative effects on firm performance and apparently, both of the effects are present in most of the firms.

(2) Reverse Causality Between Capital Structure and Firm Performance : Firms with higher return can substitute equity for debt because higher returns act as a buffer against the portfolio risk for these firms (Berger & Bonaccorsi di Patti, 2006). Firms that maintain higher efficiency rates can choose a lower debt to equity ratio in the future (Berger & Bonaccorsi di Patti, 2006 ; Demsetz, 1973). Under the efficient-risk hypothesis, efficient firms select a higher leverage ratio because higher efficiency lowers the financial distress and the cost of bankruptcy. In contrast, the franchise-value hypothesis argues that firms with higher efficiency go for extra equity capital and choose lower leverage ratios to protect their future income or the franchise value. These two hypotheses have opposite concepts of how capital structure affects firm performance.

(3) Ownership Structure and Performance : The goal of a firm is to increase the shareholders' wealth. The concentration of ownership has a great impact on the value maximization, and this concentration of ownership creates responsibility and accountability to the managers. A number of researchers have argued that large outside shareholders reduce managerial entrenchment as both have an interest in profit maximization and to have greater control over the assets to fulfil their interests (Shleifer & Vishny, 1986).

Corporations in the U.S. with dispersed ownership among small shareholders and with higher internal control tend to underperform than the others. Shleifer and Vishny (1986) argued that the presence of a large external equity holder can discipline and monitor managers' activities which helps in lowering the agency conflicts. In contrast, an increase in the insider share ownership has the entrenchment effect (Demsetz, 1983; Fama & Jensen, 1983) which will give them an opportunity to exploit and harm the interest of the external investors. Claessens, Djankov, Fan, and Lang (2002) and Villalonga and Amit (2006) argued that maximization of firm value largely depends on the entrenchment effect.

Jensen and Meckling (1976) argued that shareholders with more concentrated ownership in a firm prefer less debt as debt brings more monitoring and/or loss of control. Family shareholders have exclusive incentive structures because they have concerns over business and family reputation as well as the firm's survival. These concerns decrease the agency cost for the stakeholders. However, there are chances that the family shareholders' decisions will affect the minority shareholders' interest (Claessens et al., 2002; Villalonga & Amit, 2006). Anderson and Reeb (2003), Maury (2006), and King and Santor (2008) argued that family firms with large personal ownership share outperformed non-family firms. Afza and Mirza (2010) on Pakistani firms showed that firms whose shares are owned by managers and individuals paid lower dividends because managers extracted their own benefits in the form of incentives and neglected the rights of shareholders.

For the emerging markets, studies found mixed relationship between ownership structure and firm performance. Claessens and Djankov (1999) on the Czech Republic, Lins (2003) on a sample of 1,433 firms from 18 emerging markets, and Suto (2003) on Malaysian firms found a positive relationship between ownership concentration and the firm value. Chen, Cheung, Stouraitis, and Wong (2005) found a positive relationship between ownership concentration and Tobin's Q for Chinese firms.

In developing markets, regulatory authorities and protection of investors is weak, which lessens the firm value and external monitors play an important role in improving the value of a firm (Rashid, 2011). For non-financial firms listed on the Karachi Stock Exchange (for the time period from 1998-2002), Gani and Ashraf (2005) found that majority shareholders exploited the rights of minority shareholders in the market. They argued that weak law

enforcement mechanism, lack of investor protection, and poor judicial regimes resulted in negative effect on firm performance in Pakistan. Rashid (2011) showed that corporate governance has a vital role in affecting the value of a firm. The mechanisms and process through which the value of a firm is affected differ for developed and developing countries.

Hypotheses Development

(1) Efficiency Risk Hypothesis : The doctrine of efficiency-risk hypothesis states that efficient firms opt to maintain lower equity ratios as higher firm efficiency lowers the expected bankruptcy and financial distress costs. Higher profit efficiency is expected to generate higher expected returns for a given capital structure. Berger and Bonaccorsi di Patti (2006) noted that higher efficiency, substituting the equity capital can assist a firm in protecting against future crises. The joint efficiency-risk hypothesis states that efficiency is strongly (positively) associated with expected returns, and higher expected returns from high efficiency are substituted for equity capital to manage risks. In fact, the efficiency-risk hypothesis is a spin-off of the trade-off theory of capital structure where differences in efficiency enable firms to alter their optimal capital structure, *ceteris paribus*. Thus, we can generate our first hypothesis as:

→H1 : More efficient firms choose higher leverage ratios because higher efficiency is expected to lower the costs of bankruptcy and financial distress.

(2) Franchise Value Hypothesis : In choosing the optimal capital structure, firms with high efficiency have to trade-off between the advantages of holding higher debt and costs of financial distress. Firm value is maximized where the expected benefits equate the cost associated with that level of debt.

Demsetz, Saidenberg, and Strahan (1996) and Berger and Bonaccorsi di Patti (2006) argued that lower debt to equity is preferred by the firms with high efficiency in order to safeguard the economic rent from the threat of liquidation. Berger and Bonaccorsi di Patti (2006) stated that higher efficiency will create economic rents when efficiency is expected to continue in the future. Thus, shareholders may choose to hold extra equity capital to protect these rents that might be lost in the event of liquidation, even if the liquidation involves no obvious bankruptcy or distress costs. Both hypotheses have opposite explanation on how capital structure affects firm performance.

→H1a : More efficient firms hold extra equity capital, and therefore, choose lower leverage ratios to protect their future income or franchise value.

(3) Agency Cost Hypothesis : The separation of ownership from control in large firms creates agency conflicts (Berle & Means, 1932). Managers who own anything less than 100% of the residual cash flow rights have potential conflicts of interest with outside shareholders. This is because the managers choose to reinvest the free cash rather than return it to investors (Jensen, 1986; Jensen & Meckling, 1976). Increasing the proportion of the equity of owner-managers can reduce the agency conflicts between the managers and external investors (Ang, Cole, & Lin, 2000). Grossman and Hart (1982) and Williams (1987) argued that higher leverage lowers the agency cost by monitoring the managers to act in favour of equity holders and hence increases the value of a firm. This is known as the agency cost hypothesis.

→H2 : Higher leverage is expected to lower agency costs, reduce inefficiency, and will lead to improvement in firm performance.

(4) Convergence of Interest Hypothesis : Convergence of interest hypothesis explains the positive impact of insider shareholders (managerial ownership) on firm's performance. Higher level of managerial ownership has a negative effect on the conflicts between managers and shareholders as the interests of both parties are aligned. A higher level of managerial ownership motivates the managers to be more active and devoted towards better firm performance as they prevent the wastage of resources. Fama and Jensen (1983) showed that when the ownership concentration rises, it allows the entrancement of management.

→ **H3 : More concentrated ownership should have a positive effect on firm performance.**

(5) Ownership Entrenchment Hypothesis : Maximization of the firm value depends on the entrenchment effect when large controlling shareholders are present (Claessens et al., 2002; Dow & McGuire, 2009; Villalonga & Amit, 2006). Family firms' shareholders have exclusive incentive structures, and managers from a family firm have anxieties over business, family status, and firm existence. This concern decreases the agency cost of outside equity and debt (Anderson & Reeb, 2003; Demsetz & Lehn, 1985), while there are chances that the controlling family shareholders might have an adverse impact on minority shareholders (Claessens et al., 2002; Villalonga & Amit, 2006). Studies have shown that family firms which have large ownership stocks tend to outperform non-family firms (Anderson & Reeb, 2003; King & Santor, 2008; Maury, 2006; Villalonga & Amit, 2006).

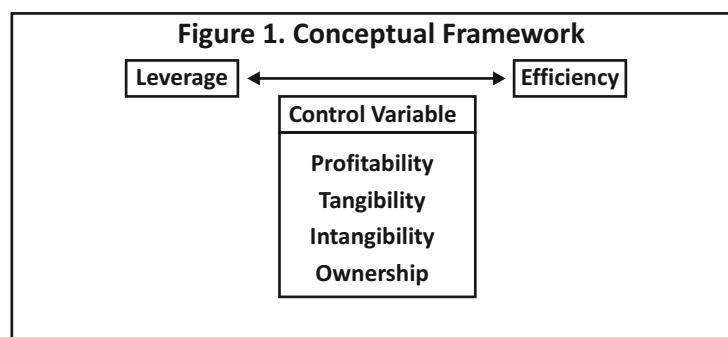
→ **H3a : The effect of ownership concentration on firm performance is expected to be negative.**

Conceptual Framework

The Figure 1 shows the conceptual framework for the bi-directional effects, that is, the leverage effect on efficiency and the efficiency effect on leverage in the presence of control variables.

Determinants of Capital Structure

(1) Asset Tangibility : Asset tangibility and its collateral value is a commonly used variable in capital structure research. Jensen and Meckling (1976) and Myers (1977) suggested that shareholders of highly leveraged firms requested higher return because of the increased risk. On the other hand, debt holders protect themselves by forcing a firm to place a tangible asset as security before issuing loans. The debt holders try to avoid financing the project which is uncollateralized. Wald (1999), Chen (2004), Zou and Xiao (2006), Viviani (2008), and Serrasqueiro and Roga (2009) showed a positive relationship between leverage and asset tangibility. However, the excess use of the tangible assets results in a negative relationship between tangible assets and leverage (Bauer, 2004; Ferri & Jones, 1979; Karadeniz, Kandir, Balcilar, & Onal, 2009; Mazur, 2007; Titman & Wessels, 1988).



Booth, Aivazian, Demircug - Kunt, and Maksimovic (2001) found a negative relationship between asset tangibility and leverage for the firms in Brazil, India, Pakistan, and Turkey.

(2) Profitability : Profitability is one of the most crucial factors in capital structure. The trade-off theory suggests that firms with higher profitability should go for higher debt to get the tax benefit. Pecking order hypothesis states that financial managers give preference to internal financing over external financing. As a result, most profitable firms should have less leverage (Aggarwal & Kyaw, 2010; Bauer, 2004; Booth et al., 2001; Chen, 2004; Margaritis & Psillaki, 2010; Rajan & Zingales, 1995; Serrasqueiro & Roga, 2009; Titman & Wessels, 1988; Toy, Stonehill, Remmers, Wright, & Beekhuisen, 1974; Viviani, 2008; Zou & Xiao, 2006).

(3) Firm Size : Firm size has an impact in selecting an optimal capital structure. The impact of firm size on capital structure varies from country to country (Fama & French, 2002; Rajan & Zingales, 1995; Rashid et al., 2014; Titman & Wessels, 1988). The larger firms in U.S. have a higher leverage ratio than smaller firms, as larger firms are well managed, more diversified, and have fewer chances of bankruptcy (Rajan & Zingales, 1995). Himmelberg, Hubbard, and Palia (1999) stated that larger firms can save more on monitoring the top management's activities. However, larger firms do suffer from hierarchical managerial inefficiencies and may incur agency costs (Williams, 1987). Wald (1999) showed a positive relationship between firm size and leverage conducted on firms of USA, UK, France, and Japan, but he found a negative relationship in Germany. Marsh (1982) ; Bauer (2004) ; Deesomsak, Paudya, and Pescetto (2004) ; Zou and Xiao (2006) ; Eriotis, Vasiliou, and Ventoura-Neokosmidi (2007) ; and Serrasqueiro and Roga (2009) found a significant positive relationship between leverage and firm size. These findings support the trade-off theory.

In contrast, the pecking order theory states that there is a negative relationship between size and the level of debt for the larger firms. For the smaller firms, acquiring external financing is difficult. Thus, smaller firms tend to be more profitable to avoid them being dependent on external sources (Claessens et al., 2004). Chen (2004) found a significant negative relationship between firm size and long-term leverage for the Chinese firms.

(4) Intangibles : Intangibles are the future growth indicators for the firms (Titman & Wessels, 1988; Ozkan, 2001). Myers (1977) argued that firms which have more growth opportunities have to deal with the issue of underinvestment more often. Firms with growth opportunities are trying to maintain lower leverage to safeguard themselves from the cost of moral hazards and temptation of financing from external sources.

Measurement of Data Envelopment Analysis

Farrel (1957) laid the foundation of modern efficiency measurement based on the concept of production theory. He considered efficiency as the sum of two components : technical efficiency and allocative efficiency. Technical efficiency states how a firm uses minimum input to get maximum output. Allocative efficiency is measured by the optimal level where the marginal cost of production equates the price of the product. In this study, the data envelopment analysis (DEA) is used to measure the efficiency of a firm.

DEA is a linear application derived from the production theory that compares firms in the same industry that use similar inputs to generate output. Charnes, Cooper, and Rhodes (1978) showed that DEA models construct a non-parametric frontier over the data points so that observations may lie below or on the frontiers. DEA compares two units that are providing same services, and maximize the efficiency of one unit. In this process, a unit that achieves 100% efficiency is denoted as efficient, while the other units are referred to as inefficient units. In general, efficiency is defined as the ratio of the weighted sum of outputs to weighted sum of inputs (Metters, Frei, & Vargas, 1999) and can be expressed as follows:

$$\text{Efficiency} = \frac{(\text{Weighted Sum of Outputs})}{(\text{Weighted Sum of inputs})} \quad (1)$$

$$\text{Efficiency of Unit } (j) = \frac{(u_1 \cdot y_{1j} + u_2 \cdot y_{2j} + \dots)}{(v_1 \cdot x_{1j} + u_2 \cdot x_{2j} + \dots)} \quad (2)$$

where,

u_i is the weight of output i , y_{ij} measures the quantity of output- i derived from unit j , v_i represents the weight of input j , and x_{ij} is the quantity of input- i used by unit j . Following the maximization approach as stated by Yolalan (1993), the efficiency model can be transformed into a linear program.

$$\text{Max } h_k = \sum_{r=1}^s U_{rk} Y_{rk} \quad (3)$$

Subject to :

$$\sum_{r=1}^s U_{rk} Y_{rk} - \sum_{i=1}^s V_{ik} X_{ij} \leq 0; \quad (4)$$

For k and $j = 1, 2, \dots, n$

$$\sum_{r=1}^s V_{rk} X_{ij} = 1$$

$$U_{rk} \geq 0; \quad r = 1, 2, \dots, s$$

$$V_{ik} \geq 0; \quad i = 1, 2, \dots, m$$

Decision Making Units,

weighted sum of inputs set to unity,

outputs,

inputs.

Methodology

The empirical relationship between efficiency and leverage is assessed by controlling the firm specific characteristics and ownerships on a sample of 50 firms from the textile sector listed on the Karachi Stock Exchange for the period from 2008-2012. To overcome the effect of the conditioning variable on leverage and efficiency, time lag has been considered. For example, the pecking order theory states that effect of profitability on leverage is from the past, not from current profitability. By using the static and dynamic models, we estimated the agency cost and leverage equation. Results of the models are very helpful in predicting the efficiency hypothesis and agency cost. This study has used two models to test the hypotheses : the efficiency model and the leverage

Table 1. Variables Notation and Calculations

Variables	Notation	Calculations
Efficiency	<i>EFF</i>	Data Envelopment Analysis (DEA)
Leverage	<i>LEV</i>	The ratio of total debt to total assets (low levered).
	<i>LEV</i> ²	The ratio of total debt to total assets (high levered).
Profitability	<i>PROF</i>	The ratio of earnings before interest and taxes (EBIT) to total assets.
Tangibility	<i>TAN</i>	The ratio of total physical assets to total assets of a firm.
Intangibility	<i>INTAN</i>	The ratio of intangible assets to total equity of the firm.
Firm size	<i>SIZE</i>	Natural log of the firm sales;
Family ownership	<i>FO</i>	The percentage shareholding held by individual (both Pakistani and foreigners) and families in the business of a company.
Institutional Ownership	<i>FO</i> ²	The percentage shareholding held by institutions (Financial).

Source: Margaritis and Psillaki (2011)

Table 2. Previous Findings for the Efficiency Model

Variables	Expected Signs	
	Positive	Negative
Leverage (LEV)	Barclay, Smith, and Watts (1995)	
Profitability (PROF)	Fama and French (2002)	
	Titman and Wessels (1988)	
Tangibility (TANG)	Frank and Goyal (2003)	
	Petersen and Rajan (1994)	
Intangibles (INTANG)		Ozkan (2001)
		Titman and Wessels (1988)
Firm size (SIZE)		Williams (1987)
Family Ownership (INSIDER)	Jiraporn and Gleason (2007), Pedersen and Thomsen (2003)	

Table 3. Previous Findings for the Leverage Model

Variables	Expected Signs	
	Positive	Negative
Efficiency (EFF)		Berger and Bonaccorsi di Patti (2006)
Profitability (PROF)	Petersen and Rajan (1994)	Myers and Majluf (1984)
Tangibility (TANG)		Harris and Raviv (1991)
		Myers (1977)
Intangibles (INTANG)		Ozkan (2001)
		Titman and Wessels (1988)
Firm size (SIZE)		Rajan and Zingales (1995)
Family Ownership (INSIDER)	Jiraporn and Gleason (2007)	

model. The notation and calculations for the variables used in both the models are described in the Table 1.

(1) The Efficiency Model : The regression equation for the firm performance model can be given as:

$$EFF = \alpha_0 + \alpha_1 LEV_{i,t} + \alpha_2 LEV_{i,t}^2 + \alpha_3 TAN_{i,t} + \alpha_4 INTAN_{i,t} + \alpha_5 PROF_{i,t} + \alpha_6 SIZE_{i,t} + \alpha_7 FO_{i,t} + \alpha_8 FO_{i,t}^2 + e_{i,t} \quad (5)$$

The Table 2 shows the nature of the relationship that previous researchers have found on the impact of efficiency on leverage and the other mentioned variables.

(2) The Leverage Model : The relationship between efficiency and leverage is explained by the reverse causality hypothesis. This model tests two complementing hypotheses, that is, the efficient risk hypothesis and franchise value hypothesis. If efficiency has a positive effect on leverage, it supports the efficiency risk hypothesis, and if the effect of efficiency is negative on leverage, then it supports the franchise value hypothesis.

The leverage equation is given as follows:

$$LEV = \beta_1 + \beta_2 EFF_{i,t} + \beta_3 TAN_{i,t} + \beta_4 INTAN_{i,t} + \beta_5 PROF_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 FO_{i,t} + \beta_8 FO_{i,t}^2 + V_{i,t} \quad (6)$$

The positive and negative impact of leverage on efficiency and the other variables in the past studies by various authors is depicted in the Table 3.

Table 4. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PROF	150	0	1	0.02	0.126
TANG	150	0	.74	1.16	0.933
INTANG	150	0	0	0	0.013
SIZE	150	0	7.834	6.013	1.660
LEV	150	0	.53	0.71	0.384
LEV ²	150	0	.28	0.64	0.899
No. of Employees*	150	225	6,683	1,694.37	0.126
Tangibles	150	-43,627	50,000,000	6,150,000	9,776,668
Fixed tangible assets	147	0	48,000,000	4,499,000	8,201,900
Production	150	0	117,030	19,600	20,773
EFF	150	0	1	0.37	0.33
INSIDER	140	27.13	99.56	77.846	19.969
Financial	150	0.10	72.90	20.85	19.26

*In thousands

Empirical Analysis and Results

The descriptive statistics give us an idea regarding the nature of the data, while regression analysis is applied to test the hypotheses. Ordinary least squares (OLS) is used for the leverage and the efficiency model in the first stage. The quantile regression is applied on the leverage model to find the effect of efficiency on the leverage and reverse causality.

The descriptive statistics of the data collected from the state bank website and audit annual reports of the textile firms that are listed on the Karachi Stock Exchange are presented in the Table 4. The mean of insider shares is found to be 77.84%; whereas, the financial sector holds 20.85% shares on average. The mean score of profitability is 0.02, tangibility is 1.16, intangibility is 0.002, leverage is 0.70, size is 0.601, and efficiency is 0.366. The standard deviation of profitability is 0.126, tangibility is 0.932, intangibility is 0.013, leverage is 0.384, size is 1.66, and efficiency is 0.33. However, the standard deviation for insider share and financial share is 19.96 and 19.74, respectively.

(1) Leverage Model : The Table 5 depicts the output of ordinary least squares and quantile regression (estimates for three leverage quintiles; 0.25, 0.50, and 0.75) of the leverage model. Intangibility is significantly positively related to leverage with a coefficient value of $\beta = 0.05$ at q25. This finding shows that in a developing country, intangibility has a role in effecting the selection of capital structure, while the tangibility is insignificant. This finding is consistent with Myers (1977).

To test the efficiency risk hypothesis and franchise value hypothesis at different levels of leverage, we have used quantile regression at different levels of leverage shown in the Table 5. Quantile regression has been used for checking the effect of efficiency on leverage and has an advantage over ordinary regression, as for quantile regression, it is not important to segment the sample and to run regression separately for the segmented samples.

As depicted in the Table 6, there is a positive effect of efficiency on leverage from low to high distribution with the coefficient value 0.1937 at q25 and p -value of 0.006 and 0.165 at q25 and p -value of 0.0013, which supports the efficiency risk hypothesis. So, the hypothesis H1 is accepted, which contradicts the franchise value hypothesis (Berger & Bonaccorsi di Patti, 2006) even at very high leveraged firms. So, more efficient firms hold

Table 5. Summary of OLS and Quantile Regression for Leverage model

Variable	Coefficient	S.E	Coefficient	p - Value	Coefficient	p - Value	Coefficient	p - Value
	OLS		q25		q50		q75	
EFF	0.225*	0.071	0.193***	0.006	0.127*	0.004	0.165**	0.0013
PROF	-0.611*	0.186	-0.688*	0.100	-1.131*	0.001	-0.857**	0.0315
Size	-0.115*	0.038	-0.064*	0.199	0.008*	0.945	-0.103	0.0113
TANG	0.423	0.906	-0.269	0.910	-0.356	1.000	0.631	0.2734
INTANG	0.171*	0.027	0.005***	0.763	0.289***	0.000	0.272***	0.0000
Financial	-0.078*	0.021	-0.034**	0.210	-0.003	0.896	-0.074	0.4892
Financial ²	0.001*	0.000	0.000**	0.414	0.000	0.847	0.001	0.3685
INSIDER	0.149*	0.043	0.051**	0.039	-0.002	0.166	0.060	0.0010
INSIDER ²	-0.001*	0.000	0.000**	0.144	0.000	0.203	-0.001	0.0026
Const.	-1.95***	1.204	0.090	1.247	0.699	1.064	2.226	6.945
R-squared	0.543		0.305		0.296		0.416	

Dependent Variable: Leverage: * significant at 1%; ** Significant at 5% ; *** Significant at 10%

q25, q50, and q75 are the three leverage quantiles, respectively

extra equity capital, and therefore, choose lower leverage ratios to protect their future income or franchise value in our study.

The Table 5 depicts that profitability has a significant negative relationship with leverage, which is consistent with the pecking order theory of Myers (1984) and Myers and Majluf (1984). Like Rajan and Zingales (1995), this study has found that size has a significant negative relationship with leverage. In support of the agency cost hypothesis, ownership shows a significant positive relationship with leverage, which is consistent with the results of Jiraporn and Gleason (2007).

(2) Efficiency Risk Hypothesis : The Table 6 shows the findings of the efficiency model. The results in the Table show that profitability does not have a significant relationship with efficiency with $p = 0.816$ and $\beta = 0.051$, which is consistent with the results of Fama and French (2002) and Titman and Wessels (1988).

Tangibility has a significant negative relationship with efficiency with p - value = 0.09 and $\beta = -0.058$, which is opposite to the findings of Titman and Wessels (1988), Rajan and Zingales (1995), and Frank and Goyal (2003). Intangibility has a significant positive relationship with efficiency with $p = 0.100$ and the coefficient value, $\beta = 1.642$. Titman and Wessels (1988); Michaelas, Chittenden, and Poutziouris (1999); and Ozkan (2001) also found similar results.

Size has a significant positive relationship with efficiency ($p = 0.005$) with coefficient value ($\beta = 0.124$). Family ownership structure has a significant relationship with efficiency ($p = 0.003$), while the coefficient value is negative ($\beta = 0.054$), consistent with the results of Claessens et al. (2002) and Xu and Wang (1999). While institutional ownership depicts that increase in the ownership of an institution in developing countries increases the firm value, but the finding here is insignificant.

Leverage shows a significant positive relationship with efficiency having a coefficient value $\beta = 0.760$. Thus, H2 is accepted, which is consistent with the results of Grossman and Hart (1982) and Williams (1987). Our results support the agency cost hypothesis which says that leverage has a positive relationship with EFF, but at a higher level of LEV, the relationship is negative ($\beta = -0.215$). Similarly, Altman (1984) and Titman (1984) argued that the proportion of the debt and equity should not increase from a certain level; otherwise, it will have an inverse effect.

Table 6. Regression Table of the Efficiency Model

Model		B	Std. Error	t	Sig.
1	(Constant)	-1.900	1.425	-1.333	0.185
	PROF	0.051	0.220	0.233	0.816
	TANG	-0.058*	0.034	-1.707	0.090
	INTANG	1.642*	1.026	1.601	0.100
	SIZE	0.124***	0.044	2.854	0.005
	INSIDER	0.054**	0.052	1.035	0.003
	INSIDER ²	0.000	0.000	-1.070	0.286
	Financial	-0.045	0.026	-1.735	0.085
	Financial ²	0.001	0.000	1.671	0.097
	LEV	0.760***	0.210	3.625	0.000
	LEV ²	-0.215***	0.087	-2.452	0.015

Dependent Variable: Efficiency

* significant at 1%; ** Significant at 5% ; *** Significant at 10%

(3) Convergence of Interest Hypotheses : As depicted in Table 7, *p* stands for percentage of ownership in a firm, and how profitability is effected when ownership structure is increased. How efficiency, leverage, and profitability vary across insider (family) and financial firms, across dispersed (low) and concentrated (high) firms is also shown in the Table 7. It is found that high ownership concentrated firms have high efficiency and profitability at different levels. This result supports the convergence of interest hypothesis, so our hypothesis H3 that more concentrated ownership should have a positive effect on firm performance is accepted, which is aligned with the studies of Fama and Jensen (1983). In developing countries, this minor difference shows that both the insider and institutional shareholders have the same effect. Firms with more institutional shareholders have higher profitability compared to the family-owned firm. The ownership entrenchment hypothesis H3a that the effect of ownership concentration on firm performance is expected to be negative is not supported by our results.

(4) Incremental Regression : To know the incremental contribution of a variable in explaining the variance in the dependent variable, we have used the incremental regression. Incremental regression analysis gives us an idea about the contribution of the independent variables to the model or how much change it creates in the dependent variable.

The Table 8 shows the results of incremental regression on the leverage model. On top, the *R*-square value is 52.6%, but when the independent variable, that is, efficiency is removed, the *R*-square falls to almost 51%. In the control variable, the change due to profitability is almost 2% (51%). In the model, tangibility has a negative effect with its removal; it increases the *R*-square by 2%. Intangibility has the most effect as it reduces the *R*-square to 40% (by 12%). Size, insider, and financial reduces the *R*-square to 51%, 50.3%, and 49%, respectively. Incremental regression shows that the intangible assets are the most important factor in affecting the value of leverage of a firm, and the tangibility is negatively affecting the model.

This study has applied incremental analysis to check the importance of independent and control variables in affecting the value of a firm. The test is performed on an individual variable; we remove the individual variable and capture the increase or decrease in the value of *R*-square. The results of incremental regression on efficiency model are shown in the Table 9, where the *R*-square value is 21.6% , and when the independent variable (leverage) is removed, *R*-square falls to 13.7%. When profitability is removed from the model, the *R*-square falls from 21.6% to 21.1% ; by removal of tangibility, *R*-square decreases to 19.7%, and intangibility reduces the *R*-square to

Table 7. Distribution of Efficiency, Profitability, Leverage

	p25	p50	p75	Mean	Std. Dev.	p-value	N
EFFICIENCY							
Insider	-0.00524	-0.00430	-0.06585	-0.02513	0.32982	0.00877	150
Institutional	-0.00613	-0.00575	-0.06771	-0.02653	0.32982		150
High	0.000035	0.000018	0.000073	0.000042	0.32902		0.46828
Low	-0.008881	-0.007567	-0.075324	-0.030591	0.31982		150
PROFITABILITY							
Insider	0.00595	0.00315	0.00438	0.00449	0.13637	0.00872	150
Institutional	0.00587	0.00361	0.00465	0.00471	0.12337		150
High	-0.0000009	-0.000003	-0.000003	-0.0000024	0.12637		0.43821
Low	0.0060300	0.003630	0.004798	0.0048193	0.12037		150
LEVERAGE							
Insider	-0.00748	-0.01244	-0.00994	-0.00995	0.38401	0.00230	150
Institutional	-0.01554	-0.01513	-0.01280	-0.01449	0.38401		150
High	0.000029	0.000034	0.000022	0.000028	0.38401		0.09770
Low	-0.013376	-0.017349	-0.013193	-0.014639	0.30500		

Table 8. Incremental Regression Leverage Model

Model	R- Square
OLS	0.52630
EFF	0.509848
PROF	0.507535
TANG	0.542049
INTANG	0.409422
Size	0.513442
Insider	0.503576
Insider ²	0.497090
Financial	0.496484
Financial ²	0.509960

Table 9. Incremental Regression Efficiency Model

Model	R- squared
OLS	0.216001
LEV	0.137003
LEV ²	0.177421
PROF	0.211217
TANG	0.196981
INTANG	0.194989
Size	0.165321
Insider	0.205450
Insider ²	0.205029
Financial	0.194455
Financial ²	0.195688

19.5%. In all control, the variable size has a higher effect as it reduces the *R*-square to 16.5%. Insider and financial decreases the *R*-square to 20.5% and 19.4%, respectively. The results show that leverage is the most important variable in affecting the efficiency.

Research Implications

Firms can reduce their agency problems by increasing the leverage to some extent as decrease in agency problems increases the performance of a firm, but increasing leverage raises the risk of bankruptcy and financial distress. Our study has helped, to some extent, in recovering the irregularities found in the existing studies. Hence, it cautions to use the standard practice which draws inferences on the choice of capital structure using conditional mean estimates. In contrast to the financial performance indicators that rely on productive efficiency measures, we focused on the principal-agent dilemma costs.

Conclusion

This study tested two models, that is, the efficiency model and leverage model. By testing the hypotheses that were generated for each of these models, several conclusions are drawn from the study. In the leverage model, the relationship between leverage and efficiency is tested by using the efficient risk hypothesis and franchise value hypothesis. The results of the study support the efficiency risk hypothesis and found a significant positive relationship between leverage and ownership. Furthermore, we observed that a more concentrated ownership has a major role in decreasing the agency cost, which results in better performance of a firm. Specifically, we tested the agency cost hypothesis which states that high leverage improves the firm value.

The efficiency model was implemented to check the agency cost hypothesis, which shows that with an increase of leverage, the agency costs decrease, it means that there must be a positive relationship between leverage and efficiency (agency cost hypothesis). In our study, we found that leverage is positively affecting the efficiency, which supports the agency cost hypothesis as well.

By using a sample of listed textile firms of Pakistan, the study also considered the reverse causality relationship among ownership, leverage, and efficiency. The reverse causality relationship between leverage and ownership structure is also investigated by setting out the two hypotheses: the efficiency-risk hypothesis and the franchise value hypothesis. Using quantile regression, positive impact of efficiency on leverage was found. Thus, we found that with higher levels of leverage, the income effect resulting from high efficiency balances the substitution effect of debt for equity capital.

Limitations of the Study and Scope for Further Research

This study is limited to listed firms in the textile sector of Pakistan. In future research studies, the extension of this analysis across different countries and different industries will yield some useful and interesting facts. Future researchers can also extend the study to the financial sector as they have different accounting procedures, so the results might be different.

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