Firm’s characteristics and capital structure: A panel data analysis of Pakistan’s insurance sector

Bilal Sharif*, Muhammad Adnan Naeem and Abdul Jabbar Khan

Hailey College of Commerce, University of the Punjab, Lahore, Pakistan.

Accepted 28 November, 2011

The intent of this study is to investigate that factors identified in developed countries which are attributed as imperative ones to attain optimal capital structure, provide compelling justifications for capital structure decisions in insurance companies of Pakistan. Empirical exploration of factors, that drives optimal capital structure apply on panel data of 31 insurance firms from 2004 to 2009. Two econometric panel data techniques, fixed effects and random effects are pertained. Hausman's specification test is performed in order to test appropriate model for the study. The outcomes of study advocate that, profitability, age and earnings volatility have inverse relation with leverage and are significant. Liquidity also has inverse relationship with debt ratio but it is not significant. Alternatively, size and growth opportunities have direct relationship with leverage but only size is significant. These outcomes are in line with theoretical theories such as pecking order theory and trade off theory. This research has provided an initial foundation to ascertain the factors influencing decisions of capital structure of Pakistan's insurance sector and it can be a preliminary base for more methodical investigation. Moreover, this can also be helpful for the managers in making decisions about optimal capital structure. This study, to the author’s knowledge, is conducted first time in Pakistan for investigating the capital structure theories and their implications on insurance companies of Pakistan with the most recent panel data available. Furthermore, this study validates that some features have an effect on capital structure of Pakistani insurance companies as acknowledged in developed countries.

Key words: Capital structure, insurance association, insurance companies, Pakistan.

INTRODUCTION

Firms more often than not make their decisions to get the most out of the proportion they are using for their capital. How to structure capital is the very first question that financial managers ask themselves before getting into any financial activity. Capital structure is not only concerned with discovering the right class of finance but it is more than that; it focuses on the optimal mix that should be created to maximize the shareholders wealth. So, capital structure is characterized as mix of debt and equity in total capital of the firm which entails to accomplish overall objectives of the firm.

Business and risk are just two sides of a picture. In today's risky business era, no one can survive without covering up the business risks with some insurance. The primary function of any insurance firm is to pay the claims of insured and for that purpose they need a mix of debt and equity to make good the losses and achieve their own financial goals. Businesses may stop operating or may go insolvent due to a high risk that is why insurance companies are very watchful to maintain their financial structure sound to lend a hand to other businesses.

Modigliani and Miller (1958) did extraordinary work on capital structure and in response to their theory; many authors and scholars jumped into this topic and presented many theories on corporate capital structure. All the theories presented by authors linked capital-structure with firm-specific features and institutional environment. For the case in point some features and institutional environments are tax advantages of debt (Modigliani and Miller, 1958), debt as signal of firm’s quality (Leland and Pyle, 1977; Ross, 1977), agency cost of debt (Jensen and Meckling, 1976), use of debt to
overcome the free cash flow problem (Jensen and Meckling, 1986) and use of debt as anti-takeover device (Haris and Raviv, 1988).

As there is no consensus yet on the factors that can be weighted to optimize the capital structure and miniature research on the financing behavior of Pakistani insurance firms, these are some aspects that induce the authors to do this research. We certainly hope that findings of this empirical research would fill some gap as well as it would open new horizons for more detailed line of investigation into the topic.

Structure of the remaining part of this paper is as follows: review of the chief theoretical and empirical studies related to the research; summary of some potential theories of capital structure; the main factors that drive capital structure of the companies; detailed discussion on sources of data and methodology adopted; results and discussions are provided; finally, findings and conclusion of the study.

REVIEW OF LITERATURE ABOUT PREVIOUS CAPITAL STRUCTURE THEORIES

There are numbers of factors that settle on capital structure of any firm. Many theories have been developed so far, enlightening the optimal capital structure. Some theories are endowed with evidences that support the utilization of debt and some argues that equity is the best way of enhancing a firm’s capital structure. Here, we will briefly review the literature that is the motivation of our research and is related to or study.

Two theories in capital structure history worth mentioning here first. The Trade-off Theory presented by Modigliani and Miller (1958) argues that “market value of firm is independent of its capital structure”, using debt or equity has no material effect on firms value. According to this belief management should not be worried about using debt or equity, they can pick any proportion because in perfect market conditions any combination will worth equal. Modigliani and Miller’s proposal (often called Modigliani-Miller Proposition I) does not decline the potential preference of capital structure; however, it does assert the irrelevance of the firm’s financing means and its value, in perfect market conditions. Some assumptions put a ceiling on Modigliani and Miller’s theorem of debt peripheral nature, which do not exist in reality. When these assumptions are not taken into account, then choice of capital structure becomes very indispensable. Fischer et al. (1989) argued that with the passage of time corporations are inclined towards their preferred leverage range by issuing new securities and equity.

By eliminating explicit or implicit unrealistic assumptions by the Modigliani and Miller, this research is in support of pecking order hypothesis by Myers (1984). Baskin (1989) had given remarks on this theory that it is “Empirically motivated but lacks compelling rational theoretical justification”.

An imperative theory was presented by Myers and Majluf (1984), and Myers (1984) in opposition to Trade-off theory. This theory is based on two major assumptions. First, directors are well aware about the corporation’s prospects and they better know about the firm’s financial conditions than the external investors. Second, directors act in the best interest of shareholders. Myers and Majluf (1984), and Myers (1984) pronounced that firms tend to employ internal financing first because of high transaction costs of issuing new securities and stocks. External financing, use of debt and issuing new stocks are preferable, respectively. Due to tax deductible interest payments debt is preferred over equity. Moreover, there are some drawbacks, external debt causes increased monitoring and on the other hand, issuing more equity causes increased monitoring as well as increased control dilution over the affairs of the corporations.

Myers and Majluf (1984), and Myers (1984) first time incorporated the information possessed by the managers and insiders into the capital structure model. They give an idea that outsiders have less information about the firm’s prospects; hence debt and equity may be mispriced. If the corporations are about to finance a new projects using new equity, by severe under pricing new investors can capture more than the net present value of the project, and as a result existing shareholders will have net loss. Under this scenario, the new project may be held back by the current shareholders even though the net present value is positive. On the other hand, firm would issue new equity if firm is overrated by the market.

Krasker (1986) broaden this belief, arguing that investors are signaled worse by issuing a larger new stock; consequently decline in the stock will occur. Miller and Rock (1985) constructed a model clearly indicating that internal financing dominates external financing.

Another significant theory about deciding the capital structure is Theory of Free Cash flow. It argues that when operating cash flow of the firm surpasses the profitable investment opportunities, then the high leverage leads the firm to higher market value. There is also the threat of financial distress because divergence can arise between shareholders and managers about the payout policies.

Quite a lot of studies have been designed so far to determine the empirical authority of these theories. But unfortunately, nothing has been decided unanimously. This can be due to the subject matter of the study. Although, all these theories are hypothesized to determine the optimal capital structure but they differ in subject matter. For the case in point, the subject matter of trade off theory, pecking order theory and free cash flow theory are taxes, differences in information and agency cost, respectively. There is no universal theory to determine the capital structure. However, all the attempts done by the researcher and scholars provide insightful information about the financing behavior of the firms.
Factors drive capital structure

This segment enlightens the aspects that are considered to be highly attributable in making decisions regarding capital structure of insurance companies. Many other studies have shown that capital structure decisions are influenced by profitability, growth, size of the firm, age, liquidity, earnings volatility and tangibility. Following, we shall discuss these attributes and their liaison with optimal capital structure.

Profitability

Pecking order theory shows that profitability has negative relationship with leverage. Myers (1984) pecking order theory, states that firms should use an order while deciding for raising funds, the order must be: utilize the retained earnings first, then opt for the debt and if these both sources are unavailable or the prevailing conditions and circumstances are against these sources then firm may opt issuing new stock to generate capital. The trade-off theory states that leverage and profitability of a firm are positively related (Bauer, 2004; Booth et al., 2001; Chen, 2004; Huang and Song, 2006; Jong et al., 2008; Rajan and Zingales, 1995; Serrasqueiro and Rogao, 2009; Titman and Wessels, 1988; Tong and Green, 2005; Toy et al., 1974; Viviani, 2008; Wald, 1999; Zou and Xiao, 2006).

Growth opportunities

Another factor found to be correlated with the firms debt structure is growth opportunities. Positive relation is found in China and many other developed countries except the United States (Wald, 1999). Growth opportunity is a kind of intangible asset. Fama and French (2002) recommended that, firms which have more growth opportunities are be likely to borrow fewer funds. While the firms that have less growth opportunities tend to borrow more funds, as growth opportunities are intangible asset and cannot be used as collateral (Jensen and Meckling, 1986; Myers, 1997). The signaling theory states that the firms that have more growth opportunities and more future earnings should use more leverage, as they will be in a position to pay off the interest.

Size

Quite a lot of researches show that size of firm and capital structure decisions are correlated. Tong and Green (2005) had found inverse realtition between size and leverage. On the other hand, a postive rationship was founded between size and leverage of the firms (Fama and French, 2002). Large firms are less exposed to risk as they are more diversified and there are very little chances for them to go bankrupt. According to trade off theory large firms should borrow more debt for optimal capital structure. Furthermore, large firms have low agency cost such as low monitoring cost because of trouble-free access to capital markets. Pecking order theory advocates negative relationship between said variables because large firms have no issue of information asymmetry, they can issue common stock equity easily. These studies had showed that size of the firm and leverage are positively correlated (Bauer, 2004; Deesomsak et al., 2004; Eriotis et al., 2007; Jong et al., 2008; Marsh, 1982; Serrasqueiro and Rogao, 2009; Wald, 1999; Zou and Xiao, 2006).

Liquidity

Research has shown that there exist a correlation between the firm’s liquidity and the optimal capital structure of the firm. Liquidity is the firm’s ability to meet its short term obligations as they become due. The more the liquid firm, the more able it is to pay off interest on debt. Fama and French (2002) found a positive relationship of liquidity with leverage. It states that firm with high liquidy should option debt as major contributor to the capital structure as firm can easily pay off the debt. Conversely, Tong and Green (2005) concluded that there is a negative correlation between liquidity and leverage. A number of researchers recommended that, highly liquid firm should use internally generated funds (Deesomsak et al., 2004; Mazur, 2007; Viviani, 2008).

Age

Many studies had taken age of the firm as an explanatory variable that may determine the capital structure decisions. Bigger firms that have been operational for many years are so stable that they do not need debt to accumulate funds (Nivorozhkin, 2005). Alternatively, smaller firms that are in business not long ago utilize more debt for capital needs. Diamond (1989) suggested that, as larger firms that have created goodwill in market by doing successful business can generate the needed debts easily as creditors know their ability to pay their obligations in due dates. An inverse relationship between age of the firm and leverage prevailing. While, direct relationship between age and long term debt and inverse relation with short term debt was founded (Hall et al., 2004).

Earnings volatility

Earning volatility is a decreasing function of firm’s capital structure. If the firm uses more debt in its capital structure, then the firm needs more stable cash inflows to
meet the interest payments and principal payments as they get due. If the earning volatility of a firm is high, there’s more risk that firm may not be able to make the debt. Thus it indicates that contractual claims and leverage of the firm has negatively correlated with each other (Booth et al., 2001; Bradley et al., 1984; Fama and French, 2002; Jong et al., 2008). The objective of the study is to determine the variables that explain the variance in capital structure decision. The variables were selected after rigorous literature review and the most used variables were taken as part of the study for the momentous comparison. The dependent variable in the study is leverage and independent variables include profitability, growth opportunities, size, liquidity, age and earning volatility.

Table 1 presents the proxies, signs of theoretical and expected relationship; signs in major empirical studies and supported theories of variables. The explained variable leverage is measured as debt ratio, which is total debt divided by total assets of the firm. Total debt include both short and long term debt; capital decisions are related with long term debt but we have included short term debt also as short term debt has a significant proportion in the total debt. Independent variables include profitability, growth opportunities, size, liquidity, age and earning volatility.

1. Profitability takes net income before tax divided by net premium. Perceived relationship between profitability and leverage is inversely proportionate. Theories applicable to profitability are bankruptcy cost, trade off theory and pecking order theory.

2. Growth opportunities variable is calculated by ratio of sales growth to total assets growth. Relevant theoretical support is provided by signaling theory, trade off theory and pecking order Theory and expected relationship with leverage is negative in literature.

3. Size is measured by natural log of premiums. Agency cost of debt, bankruptcy cost supports its positive relationship with leverage.

4. Liquidity is calculated by current ratio. Liquidity’s relevance is better explained by the help of free cash flow theory, agency cost of debt and trade off theory. This all forecast its inverse relationship with leverage.

5. Age consists of difference between observation year and establishment year; and study expects negative relationship.

6. Earning volatility is determined by absolute difference between percentage change in EBIT and average of this change over sample period. Its relationship is explained by agency theory, trade off theory, financial distress theory. Negative relationship has always been forecasted with leverage.

**DATA AND METHODOLOGY**

This study is piloted to determine the factors that can be endorsed to the change in capital structure decisions of the insurance sector in Pakistan. Focus of the study is on insurance sector of Pakistan. Simple random sample of 31 insurance companies (non-life insurance and life insurance) are selected from total 39 companies. Other companies from the sector were dropped as their data is inaccessible and study also eludes firms, which were formed after 2004. Simply random sampling technique is exploited as it gives equal chance of selection to each company, avoiding sampling error and finally helps in deriving conclusion about whole population (Castillo, 2009).

The final sample consists on a strongly balanced panel data, from year 2004 to 2009 of 31 insurance companies in which 27 were non-life insurance and 4 were life insurance companies. Data is collected for the firms that are members of Insurance Association of Pakistan (IAP) for the year 2004 to 2009. Foremost source of data is IAP’s publications and other sources include company’s official website. Data consists of IAP’s publications (year books), which contains the financial highlights, profit and loss account and balance sheet of IAP’s members insurance companies. All variables are calculated from the book values as the data in this study only contains only financial statements.

**Experimental procedure**

In this study, panel data was employed as the sample data consists of observations from a number of companies in time series manner. As panel data consists of observations for the same cross sectional units at particular point in time, there may exist cross sectional effect of firms on some or groups of particular firms. There are several techniques to tackle these kinds of problems. The two main tools recommended are fixed effect model and random effect model.

Authors employed these techniques on the basis of decision making criteria given in the Figure 1. The Figure 1 depicts decision criteria for selecting a model in the panel data. If a random sample is drawn from a population then it is mandatory that authors should perform panel data techniques of fixed effects model and random effects model. After this authors apply the Hausman’s specification test, if the result of this test rejects the null hypothesis, which is, “difference in coefficients not systematic”, then authors uses fixed effects model otherwise they apply random effects model. But in case of random effects model, authors further test the validity of random effects model by applying Breusch Pagan Lagrange multiplier test and should use random effect model only by rejecting null hypothesis of “no random effects”. Otherwise researcher can use pooled Ordinary Least Square (OLS) regression. In this study authors have drawn a random sample of 31 insurance firms for the years of 2004 to 2009. According to the criteria of decision making authors have applied both panel data techniques of fixed effects and random effects models, and then applied the test to select to appropriate model for the study (Dougherty, 2011). Fixed effect model as it has focus on individuality of each cross sectional unit of sample and allows intercept to change for each unit.

Furthermore, the random effect model assumes that variables in the study are uncorrelated at all. Both fixed effects and random effects models are described as follows:

\[
\text{LEV}_{it} = \beta_0 + \beta_1 \text{PROF}_{it} + \beta_2 \text{GROW}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{TANG}_{it} + \beta_5 \text{LIQ}_{it} + \beta_6 \text{AGE}_{it} + \beta_7 \text{EOL}_{it} + u_{it}
\]

\[
\text{LEV}_{it} = \beta_0 + \beta_1 \text{PROF}_{it} + \beta_2 \text{GROW}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{TANG}_{it} + \beta_5 \text{LIQ}_{it} + \beta_6 \text{AGE}_{it} + \beta_7 \text{EOL}_{it} + u_{it} + \gamma_t
\]

where:

- \(
\text{PROF}_{it} = \text{Profitability of each firm } i \text{ at time } t
\)

- \(
\text{GROW}_{it} = \text{Growth Opportunities of firm } i \text{ at time } t
\)

- \(
\text{SIZE}_{it} = \text{Size of firm } i \text{ at time } t
\)

- \(
\text{TANG}_{it} = \text{Tangibility of firm } i \text{ at time } t
\)

- \(
\text{LIQ}_{it} = \text{Liquidity of firm } i \text{ at time } t
\)

- \(
\text{AGE}_{it} = \text{Age of firm } i \text{ at time } t
\)
### Table 1. Proxies, Expected relationship, Majors empirical studies results and supported theories.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Proxies / definition</th>
<th>Expected relation</th>
<th>Major studies results</th>
<th>Theories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leverage (LEV&lt;sub&gt;it&lt;/sub&gt;)</td>
<td>Ratio of total liabilities to total assets</td>
<td>-</td>
<td>-</td>
<td>Bankruptcy cost, trade off theory, pecking order theory</td>
</tr>
<tr>
<td>Profitability (PROF&lt;sub&gt;it&lt;/sub&gt;)</td>
<td>Net income before tax divided by net premium</td>
<td>-</td>
<td>-</td>
<td>Signaling theory, trade off theory, pecking order theory</td>
</tr>
<tr>
<td>Growth opportunities (GROW&lt;sub&gt;it&lt;/sub&gt;)</td>
<td>Ratio of sales growth to total assets growth</td>
<td>-</td>
<td>-</td>
<td>Agency cost of debt, bankruptcy cost</td>
</tr>
<tr>
<td>Size (SIZE&lt;sub&gt;it&lt;/sub&gt;)</td>
<td>Natural log of premiums</td>
<td>+</td>
<td>+</td>
<td>Agency cost of debt, bankruptcy cost</td>
</tr>
<tr>
<td>Liquidity (LIQ&lt;sub&gt;it&lt;/sub&gt;)</td>
<td>Current assets divided by current liabilities</td>
<td>-</td>
<td>-</td>
<td>Free cash flow theory, agency cost of debt, trade off theory</td>
</tr>
<tr>
<td>Age (AGE&lt;sub&gt;it&lt;/sub&gt;)</td>
<td>Difference between observation year and establishment year</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Earning volatility (EVOL&lt;sub&gt;it&lt;/sub&gt;)</td>
<td>Absolute difference between percentage change in EBIT and average of this change over sample period</td>
<td>-</td>
<td>-</td>
<td>Agency theory, trade Off theory, financial distress theory</td>
</tr>
</tbody>
</table>

Adapted from: Deesomsak et al. (2004).

---

**Figure 1.** Decision making criteria for the selection of model. Source: Adapted from Dougherty (2011).
Table 2. Descriptive statistics.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Observations</th>
<th>Mean</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEV&lt;sub&gt;i&lt;/sub&gt;</td>
<td>186</td>
<td>54.71</td>
<td>23.09</td>
<td>3.61</td>
<td>99.38</td>
</tr>
<tr>
<td>PROF&lt;sub&gt;i&lt;/sub&gt;</td>
<td>186</td>
<td>12.05</td>
<td>27.10</td>
<td>-245</td>
<td>85.8</td>
</tr>
<tr>
<td>GROW&lt;sub&gt;i&lt;/sub&gt;</td>
<td>186</td>
<td>1.59</td>
<td>11.51</td>
<td>-75.79</td>
<td>78.69</td>
</tr>
<tr>
<td>SIZE&lt;sub&gt;i&lt;/sub&gt;</td>
<td>186</td>
<td>8.47</td>
<td>0.83</td>
<td>6.54</td>
<td>10.45</td>
</tr>
<tr>
<td>LIQ&lt;sub&gt;i&lt;/sub&gt;</td>
<td>186</td>
<td>2.32</td>
<td>1.72</td>
<td>-0.84</td>
<td>17.1</td>
</tr>
<tr>
<td>AGE&lt;sub&gt;i&lt;/sub&gt;</td>
<td>186</td>
<td>38.05</td>
<td>28.00</td>
<td>3.00</td>
<td>140.00</td>
</tr>
<tr>
<td>EVOL&lt;sub&gt;i&lt;/sub&gt;</td>
<td>186</td>
<td>237.62</td>
<td>517.03</td>
<td>0.06</td>
<td>5462.23</td>
</tr>
</tbody>
</table>

Table 3. Pearson correlation coefficient matrix.

<table>
<thead>
<tr>
<th>Variables</th>
<th>PROF&lt;sub&gt;i&lt;/sub&gt;</th>
<th>GROW&lt;sub&gt;i&lt;/sub&gt;</th>
<th>SIZE&lt;sub&gt;i&lt;/sub&gt;</th>
<th>LIQ&lt;sub&gt;i&lt;/sub&gt;</th>
<th>AGE&lt;sub&gt;i&lt;/sub&gt;</th>
<th>EVOL&lt;sub&gt;i&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROF&lt;sub&gt;i&lt;/sub&gt;</td>
<td>1</td>
<td>-0.0129</td>
<td>0.2319</td>
<td>0.0341</td>
<td>-0.1413</td>
<td>-0.4244</td>
</tr>
<tr>
<td>GROW&lt;sub&gt;i&lt;/sub&gt;</td>
<td>-0.0129</td>
<td>1</td>
<td>0.0088</td>
<td>-0.2067</td>
<td>0.0685</td>
<td>0.0049</td>
</tr>
<tr>
<td>SIZE&lt;sub&gt;i&lt;/sub&gt;</td>
<td>0.2319</td>
<td>0.0088</td>
<td>1</td>
<td>-0.2067</td>
<td>0.0685</td>
<td>0.0049</td>
</tr>
<tr>
<td>LIQ&lt;sub&gt;i&lt;/sub&gt;</td>
<td>0.0341</td>
<td>-0.2067</td>
<td>1</td>
<td>-0.0824</td>
<td>0.0685</td>
<td>0.0049</td>
</tr>
<tr>
<td>AGE&lt;sub&gt;i&lt;/sub&gt;</td>
<td>-0.1413</td>
<td>0.0685</td>
<td>-0.0824</td>
<td>-0.0861</td>
<td>0.0685</td>
<td>-0.0861</td>
</tr>
<tr>
<td>EVOL&lt;sub&gt;i&lt;/sub&gt;</td>
<td>-0.4244</td>
<td>0.0049</td>
<td>-0.0861</td>
<td>0.0340</td>
<td>-0.0861</td>
<td>1</td>
</tr>
</tbody>
</table>

EVOL<sub>i</sub> = Earning Volatility of firm i at time t; β<sub>0i</sub> = Unknown intercept of each firm i; β<sub>0</sub> = y-intercept of firm i; u<sub>t</sub> = Error term of firm i at time t or between firms error; e<sub>t</sub> = Within firms error.

Table 4. Fixed effects model.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>R. std. err.</th>
<th>T</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROF&lt;sub&gt;i&lt;/sub&gt;</td>
<td>-0.1625</td>
<td>0.02772</td>
<td>-3.83</td>
<td>0.000*</td>
</tr>
<tr>
<td>GROW&lt;sub&gt;i&lt;/sub&gt;</td>
<td>0.11759</td>
<td>0.08128</td>
<td>1.49</td>
<td>0.158</td>
</tr>
<tr>
<td>SIZE&lt;sub&gt;i&lt;/sub&gt;</td>
<td>10.7782</td>
<td>4.66518</td>
<td>2.14</td>
<td>0.028**</td>
</tr>
<tr>
<td>LIQ&lt;sub&gt;i&lt;/sub&gt;</td>
<td>-0.3893</td>
<td>0.53557</td>
<td>-0.6</td>
<td>0.473</td>
</tr>
<tr>
<td>AGE&lt;sub&gt;i&lt;/sub&gt;</td>
<td>-2.468</td>
<td>0.95198</td>
<td>-3.94</td>
<td>0.015**</td>
</tr>
<tr>
<td>EVOL&lt;sub&gt;i&lt;/sub&gt;</td>
<td>-0.0123</td>
<td>0.00255</td>
<td>-4.88</td>
<td>0.000*</td>
</tr>
<tr>
<td>C</td>
<td>62.9501</td>
<td>31.728</td>
<td>1.85</td>
<td>0.056</td>
</tr>
</tbody>
</table>

R-square within = 0.2481, between = 0.0548, and overall = 0.0497; F statistics = 17.17, and Prob. > F = 0.000. Variable is significant at * 1%, ** 5%, and ***10% level of significance (two-tailed).

EMPIRICAL RESULTS

The following segment explains the outcome of models and the analysis of our findings. But before going towards models explanation, the descriptive statistics and Pearson’s correlation coefficient matrix is given. Table 2 presents the descriptive statistics of all the variables intended for the period of 2004 to 2009. From descriptive statistics, number of observation is 186 for all the variables in the model. Leverage or debt ratio is 54.71%, which shows that for the period of 2004 to 2009, 54.71% of financing of the firms are generated against the total assets of the insurance sector of Pakistan. The standard deviation of the leverage is 23.09, minimum value of the leverage is 3.6% and the maximum value is 99.38%.

Similarly, the mean, standard deviation, minimum and maximum values for all independent variables are given in this table.

Table 3 presents the correlation between all the predictors of the sample data. Correlation between predictors can cause the multicollinearity but here correlation between predictors is fairly small, not greater than cut point 0.6. This shows that there is no multicollinearity in the models.

The results of panel data techniques: fixed effects and random effects models are portrayed in Tables 4 and 5. Authors have used robust option in both models in order to control heteroskedasticity. In both techniques profitability, size, age and earning volatility are significant. Profitability and earning volatility are significant at 1%.
Table 5. Random effects model.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>R. std. err.</th>
<th>Z</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROF(_i)</td>
<td>-0.1094</td>
<td>0.04107</td>
<td>-2.66</td>
<td>0.008*</td>
</tr>
<tr>
<td>GROW(_i)</td>
<td>0.16513</td>
<td>0.1027</td>
<td>1.61</td>
<td>0.108</td>
</tr>
<tr>
<td>SIZE(_i)</td>
<td>9.51102</td>
<td>3.46941</td>
<td>2.74</td>
<td>0.006*</td>
</tr>
<tr>
<td>LIQ(_i)</td>
<td>-1.1411</td>
<td>0.56885</td>
<td>-2.01</td>
<td>0.045**</td>
</tr>
<tr>
<td>AGE(_i)</td>
<td>-0.2127</td>
<td>0.09728</td>
<td>-2.19</td>
<td>0.029**</td>
</tr>
<tr>
<td>EVOL(_i)</td>
<td>-0.0128</td>
<td>0.00191</td>
<td>-6.72</td>
<td>0.000*</td>
</tr>
<tr>
<td>C</td>
<td>-10.967</td>
<td>27.6162</td>
<td>-0.4</td>
<td>0.691</td>
</tr>
</tbody>
</table>

R-square within = 0.1544, between = 0.4830, and overall = 0.3952. Wald chi\(^2\) = 122.77, and Prob. > chi\(^2\) = 0.000. Variable is significant at *1, **5, and ***10% level of significance (two-tailed).

Table 6. Hausman test.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Fixed</th>
<th>Random</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROF(_i)</td>
<td>-0.1625</td>
<td>-0.1094</td>
<td>-0.0531</td>
</tr>
<tr>
<td>GROW(_i)</td>
<td>0.11759</td>
<td>0.16513</td>
<td>-0.0475</td>
</tr>
<tr>
<td>SIZE(_i)</td>
<td>10.7782</td>
<td>9.51102</td>
<td>1.26718</td>
</tr>
<tr>
<td>LIQ(_i)</td>
<td>-0.3893</td>
<td>-1.1411</td>
<td>0.75175</td>
</tr>
<tr>
<td>AGE(_i)</td>
<td>-2.468</td>
<td>-0.2127</td>
<td>-2.2554</td>
</tr>
<tr>
<td>EVOL(_i)</td>
<td>-0.0123</td>
<td>-0.0128</td>
<td>0.00058</td>
</tr>
</tbody>
</table>

chi\(^2\) = 21.60, and Prob. > chi\(^2\) = 0.0006.

level of significance, while age is significant at 5% level of significance in both techniques. Variable size is significant at 1% level of significant in the random effects model and at 5% level of in significant fixed effects model. Variable liquidity is only significant at 5% level of significance in random effects model. Growth opportunities variable is insignificant in both techniques. R\(^2\) is higher in fixed effects is 24.81% as compared to 15.44% random effects. While random effects model between R\(^2\) 48.30% and overall R\(^2\) 39.52% are higher as compared to fixed effects model between R\(^2\) 5.48% and overall R\(^2\) 4.97%. Both models are good fit as fixed effects model has significant F test and random effects model has significant Wald Chi\(^2\) test.

Table 6 provides the output of Hausman’s specification test. This test has a chi\(^2\) statistics of 21.60 which is significant at 1% level of significance, which shows that fixed effects model should be appropriate for this study as compared to random effects model.

DISCUSSION

Along with the empirical findings, insurance sector pursue pecking order theory as profitability is negative and has significant relationship with leverage, which is in line with the theoretical implications. Thus, insurance firms tend to rely more on internal funds in shape of retained earnings. But current financial turmoil is affecting the retained earnings as firms are facing tough time ahead due to global financial crisis. Meanwhile, due to catastrophic natural disasters and shaky Pakistani economic scenario, firms are facing it very tough to sustain in profits as each year more and more claims are filled for compensation and on the other hand negative forecast is predicted as per perceived strength of future customers. In Pakistan market is also affected by negative factor of political sustainability, devaluation of money, severe energy crisis. These factors result in lack of local as well as foreign investment. Another source of finance is raising funds through debt. But this perspective is considered as less and less feasible due to higher rate of return and volatility in the financial market. Another raising fund from Karachi stock exchange (KSE) is depicting negative impact for the firm in longer version of time due to shaky nature of stock market. This argument is equally supported by the 2008’s turmoil in the KSE 100 index, which wiped out $36.9 billion market value in just 5 months from April-August 2008. This shaky nature is also affected by the financial crunch in the foreign stock exchange markets. In 2011 European stock exchanges were facing difficult situation. While KSE 100 has very small share of foreign investment particularly in the insurance sector, so it was deemed that market would not be affected by this financial difficulty. But against the predictions KSE 100 faced negative impact and resultantly endured negative
growth. Another argument of pecking order theory argues that investors may perceive that firm is in short-coming of financial funds, if the firm opts for stock options.

Growth opportunities variable in line with the theoretical evidences as it has positive relationship with debt ratio. But this is not significant which depicts that it is not a determinant of insurance sector's capital structure. This finding is in compliance with previous research on insurance sector of Pakistan (Ahmed et al., 2010). Positive sign shows that growing insurance firms should rely more and more on external borrowing to seize market opportunities. This argument is supported by the pecking order theory also stressing upon same point. Pakistan, whose population exceeds 180 million, while penetration of insurance sector is less than 0.3% of total population, this embarks growth opportunities available in the insurance sector of Pakistan. Inflation in Pakistan has resulted in less disposable income, which has adversely affected the insurance sector.

The variable of size also bears positive relationship with leverage ratio and is statistically significant. Previous research result shows its persistence with the trade-off theory (Ahmed et al., 2010; Sheikh and Wang, 2011). According to trade off theory, large insurance firms may rely more on debt as they can diversify their risk and enjoy tax shields benefits. Though trade-off theory suggests benefits, it also predicts the adverse factors such as cost of bankruptcy, arguing that benefits of debt lower down as rise in the debt level.

The variable of liquidity has negative sign relationship with leverage ratio and is statistically significant only in random effects model. This result is contradictory with the previous research on the insurance sector (Ahmed et al., 2010). This contradiction we can remove in future studies by further analysis on insurance sector of Pakistan. Insurance companies face more liquidity risk as compared to other financial institutions, as insurance sector receive premiums in installments, while forced to pay claims in bulk amount. Thus, firms are forced to maintain a line between cash and cash equivalent assets. This situation helps to avoid financial distress caused by catastrophic disasters and terrorism. US insurance firms were on brink of insolvency after 9/11, when bulk claims were filed.

Age variable encompasses negative sign and statistically significant with leverage. Previous research on insurance sector is in compliance with the current findings (Ahmed et al., 2010). This result indicates that the mature insurance firms in Pakistan can raise their funds internally while the new insurance firms have to rely more on debt. Prime reason is that these companies are able to accumulate huge funds in form of retained earnings. But, current scenario demands market sustainability, Pakistani insurance may be forced to look for alternative source of funds inform of debt.

Earnings volatility predictor has negative sign and statistically significant. This result is in compliance with the trade-off theory which suggests that less volatile insurance firm can take more debt as its ability to pay the interest payments on without any delay. As the stock market in Pakistan has shaky market and low trading that's way insurance companies rely more on the debt. But the option is not suitable for the insurance firms which have volatile earnings. As if these companies will not earn more, then rise in interest payments may result in bankruptcy. Insurance sector has direct relationship with the banking sector via providing coverage against monetary risks and financial turmoil, also has effect on earning of insurance companies. Pakistan insurance sector recently has been facing downfall. Though, industry showed great growth in 2005 to 2007 by 15 to 20% increase in premium. But unfortunately, growth declined to 6% in 2008 and 2% in 2009 due to poor economic situation in the country caused by flood, dismal law control and other contributory factors (Laura, 2011).

Conclusion

In the current study, authors scrutinize empirically capital structure theories and factors that determine optimal capital structure, through panel data of 31 insurance companies from 2004 to 2009 by applying two econometric panel data techniques (fixed effects and random effects). Profitability, size, age and earnings volatility are the main drivers of optimal capital structure of Pakistani insurance companies. Insurance companies pursue most important capital structure theories like pecking order theory and trade off theory. This study can open the horizons for forthcoming studies to investigate capital structure theories on other valuable sectors of Pakistan such as banking sector and energy sector. While upcoming studies may also increase panel size of insurance sector by including more companies and more years' data.

REFERENCES


