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# Debt Maturity Structure, Firm Value and Underinvestment Incentive - The Case of Pakistan

**Syed Sikander Ali Shah[*], Ali Murad Syed[**] and Sana Sheikh[***]**

**Abstract**

*This study examines the potential interaction of a firm's financing and investment decisions. It studies broadly how firms manage underinvestment and liquidity risks. To estimate the effects of these decisions, the study has incorporated four simultaneous equations using the partial dynamic adjustment model. Panel data of non-financial Pakistani firms have been used in this study. The findings of this study demonstrate that Pakistani high growth firms depend on high-leverage strategies and give greater importance to underinvestment risk rather than liquidity risk. Furthermore, growing Pakistani firms are not adopting low-leverage strategies ex ante to participate in future growth opportunities ex post. This study also examines whether or not Pakistani firms are paying special attention to the mixing of debt maturity that affects the firm's investment decisions and its value.*

**Keywords:** Liquidity risk; underinvestment; firm value; leverage; debt maturity

**JEL Classifications**: G11; G11; G23; G31

## 1. Introduction

A central issue within corporate finance is the practice of setting the policy of a firm's financing and investment decisions in order to receive optimal benefits and to share those benefits with the firm's investors. It seeks to prevent the potential risk (liquidity risk, bankruptcy risk, and the agency cost and underinvestment problem). For a levered firm, financing decisions area complex job, as these decisions can lead to agency problems and debt overhang due to asymmetric sharing of information among the managers and shareholders. If a firm attempts to raise funds internally, the availability of these funds is at a lower cost as

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compared to external sources. Firms depend on low-leverage guides to encounter the agency problem (underinvestment and liquidity risk). Credit risk, liquidity risk and firm rating play a vital role in the selection of debt maturity and the level of leverage. Underinvestment problems arise when the firm has growth opportunities in the shape of positive NPV projects, but it is not able to invest in growth opportunities due to the unavailability of external funds. A firm can absorb every potential growth opportunity, if it adopts a policy of high leverage and relies more on short-term debt maturity. If we view it from another prospective it is difficult for a firm to rotate debt more frequently and renegotiate with lenders. Therefore, the firms that tend to rely more on short-term debt face a greater liquidity risk, pay heavy costs on debt and are more likely to file for bankruptcy.

In their seminal work Modigliani and Miller (1963) argued that there is no interaction between a firm's financing and investment decisions in a perfect market. Investment is necessary for a firm to grow its asset and adopt new technologies. A firm's financing decision plays a vital role in the process of valuing growth opportunities for the firm, and it must consider different dimensions e.g., selection of mixed financing, getting the maximum advantage of a tax shield, and setting the debt maturity structure. These decisions affect the investment policy and are not irreversible (Mauer & Triantis, 1994). Firm financing and investment decisions set at the optimal level can maximize the value of a corporation. The financial policy variables are leverage, debt maturity and firm value. The investment policy variables are growth opportunities and investment.

The firm's capital structure and credit policy are designed to respond to growth opportunities and they each depend on the firm's individual characteristics (Goyal, Lehn, & Racic, 2002, Billett, KING, & Mauer, 2007, and Taleb & AL-Shubiri). Macroeconomic conditions of the country also influence the firm's capital and debt maturity structure (Korajczyk & Levy, 2003). There is an optimal debt level for a firm to finance its assets and any increase of debt from that level will likewise increase the debt-to-equity (D/E) ratio. This may affect the firm's value and can lead to bankruptcy as the benefit of debt in the form of tax shields will be below the level of cost of the new debt. As a result, leverage and firm value have shown a negative relationship. D/E ratio (a measure of leverage) limitations may be imposed by the industry benchmark, the lender's evaluation agency or any monitoring institution that ensures the liquidity and solvency of a specific industry. Debt maturity structure is a pattern of firm leverage, and it can be defined as multiple debts

outstanding in a single period. The firm's debt maturity and ratio of D/E directly influence the firm's value, and its economic relations play a role in developing correlation between debt and investment policy to curb the underinvestment problem and liquidity risk.

The relationship between financing and investment decisions is important for the survival and growth of any firm. Investment growth opportunities, investment, leverage and firm value are the main determinants of the grand debt strategy of any firm. How these variables interact can allow a firm to overcome the liquidity risk and underinvestment problem. It determines the debt policy, choices and pattern of low- and high-growth firms and high- and low-leverage firms. The investment decisions and funds forecasting to anticipate future growth opportunities are based on the interaction of leverage and debt maturity.

Moreover, firms need to examine whether the debt maturity structure or leverage is appropriate for its credit policy. The firm's efforts to establish a friendly relationship between principal and agent are affected by asymmetric information and market imperfections. Underinvestment incentive is one of the instruments which enhances or controls the agency problem.

This study is organized with the goal of examining interaction between financing and investment decisions. The interaction among firm financing decisions, debt maturity structure, investment growth opportunities, investment and firm value in the presence of the underinvestment problem are investigated. We used panel data from 12 major sectors of 424 non-financial listed, Pakistani firms in the KSE 100 index over the period of 1999 to 2008.

This study evaluates the debt pattern and policy of Pakistani firms which enables the firms' management to create the debt policy, in order to address the underinvestment and liquidity risk. Firms of developing countries always face the issues of leverage and growth opportunities; this is one reason Pakistani firms have been selected for this study. It is the authors' understanding that no study has been conducted in the Pakistani market which focuses on determinants of financing and investment decisions: the primary focus of this study. Another significant focus of this study is to investigate interactions among and between leverage, debt maturity structure, growth opportunity to investment, firm investment and firm value. Furthermore, it gives direction in four dimensions. The first dimension is a comprehensive policy design of

corporate finance and investment by non-financial listed, Pakistani firms which supports investment opportunities at an optimal level or sets the level of leverage and debt maturity. As a result, the agency problem is offset (under investment problem). The second dimension involves seeking the moderate strategy for avoiding the liquidity shortfall that arises, particularly when the firm adopts the short-term debt maturity policy. Thirdly, the leverage and debt maturity are important pillars of the debt policy which will help the Pakistani investor to mitigate the underinvestment problem. Finally it emphasizes the role and importance of the firm value in designing the corporate finance and investment policy to capture the growth opportunity for investment. In this paper we will broadly describe how the Pakistani non-financial sector manages the underinvestment problem and liquidity risk.

The paper is structured as follows: A review of the existing literature on this particular research area is presented in Section 2, hypothesis testing, data collection and research methodology is described in Section 3, explanation of results and the significance of the findings are discussed in Section 4, and Sections 5 and 6 conclude the results with policy recommendations.

## 2. Literature Review

Choices of debt or equity, selection of maturity structure and payout policy are major decisions of any firm's financial policy. The firm's financing and investment decisions are independent of each other under the assumptions of a perfect market (Modigliani & Miller, 1963). In reality many market frictions exist which establish a correlation between the firm's financial and investment decisions**.** Aggressive managers of high-growth firms have always made decisions in favor of shareholders (Myers, 1977). Furthermore, managers may forgo the positive (NPV) projects due to debt overhang problem; hence, debt plays a disciplinary role in the decision between under- or over-investment. Al Taleb and Al-Shubiri (2011) studied the debt maturity and capital structure decisions of industrial companies of Jordan and found that Jordanian companies use less debt in comparison to other companies within and outside of the region. Lewellen and Emery (1986) examined the debt policy and found that when a firm sets the maturity of debt, it considers the debt to total market value., The same study also found that the reason for the imbalance in debt maturity schedule is the anticipated future cash flows.

The relationship between leverage, debt maturity and firm value is also discussed in previous research. Dang (2011) investigated the interaction between corporate financing and investment decisions to answer the question of how firms formulate joint choice between leverage and debt maturity to mitigate the underinvestment problem. The study concluded that the firms with high growth opportunities reduce financial leverage and the growth opportunities do not affect the debt maturity. The underinvestment incentives may be mitigated if the firm lowers its leverage or reduces the structure of its debt maturity. Risky debt may cause the problem of underinvestment debt overhang and at least partially accrues payoff of positive NPV projects to the shareholders instead of fully accruing to both the managers and shareholders. Furthermore, many researchers documented the relationship between firm value and leverage (Conroy, 2009; Fama & French, 1998; Masulis, 1983). The trade–off theory by Myers (1977) has been proven by Lin and Chang (2011) by connecting the asymmetric information. Alcock, Finn, and Tan (2012) found the determinants of debt maturity of Australian firms to forecast a monotonic association between debt maturity and leverage. Their results support this monotonic relationship. They also investigated the interaction between maturity and leverage, and found that ignoring this interaction may lead to invalid conclusions to support the matching principle, hypothesis of agency costs and the hypothesis of transaction costs.

Current leverage and future growth opportunities decide the firm's behavior towards particular investment and is discussed in previous research. Lang, Ofek, and Stulz (1996) tested the relationship between the current leverage and future growth opportunities. They concluded that the variables display a negative relationship. Fernandez (2011) provided evidence of the disciplinary role of debt and determined that the relationship of the average firm's long-term leverage and investment is a strongly inverse one. This study also found that the leverage of firm with low growth has an inverse and statically insignificant relationship with the firm's investment decisions. Barclay and Smith (1995) have examined the determinants of corporate debt maturity and found that the firms having more growth options in the set of their investment opportunities were more concerned with short-term debt financing. This result is consistent with the argument by Myers (1977) that reduction of debt maturity mitigates the underinvestment problems. The authors also found that synchronized firms are subject to additional long-term debt. Tsurutani and Smith (1986) found that regulation reduces the firm's prudence more than the corporate

investment policy, consequently calculating the underinvestment problem. Majumdar (2012) argued that collateralized assets and leverage are directly influenced by debt maturity. The same study found no evidence of a relationship between debt maturities structure and an effective growth tax shield. By contrast, Al Taleb and Al-Shubiri (2011) showed that growth and debt maturity are positively related. Firm debt maturity structure is defined as multiple debts issued by a firm with different maturities outstanding at the same time. Consequently, designing a debt maturity policy is a complex task that can reduce the deadweight cost of capital and achieve the "optimal liquidation" value (Houston & Venkataraman, 1994). In the selection of debt maturity structure, a firm conducts a basic cost/benefit analysis. Korajczyk and Levy (2003) studied the benefits of the short- and long-term debt by using the partial dynamic model. They argued that short-term debt has more welfare for the organization, i.e., the calibration costs of long-term maturity is more than the associated costs of short-term debt. Another study provided evidence that short-term debt controls the agency cost arising from compensation risk (Brockman, Martin, & Unlu, 2010). Firms rely on short-term debt rather than long-term in countries with higher levels of corruption, while firms in countries with less corruption hold more long-term debt than short-term. Finally, in countries that do not have explicit bankruptcy laws, firms have more leverage and choose long-term debt (Becher et al., 2012).

Firm financing and cash flows of investment create a conflict among the shareholders and managers, which in turn leads to the agency problem. Furthermore, this study empirically investigated that leverage, debt maturity and dividends are effective tools to reduce the dependence on cash flow for investment. Managers seek potential opportunities of investment to support the level of profit and return on capital, independently of the firm value and return on equity (Ting, 2012). The conflict between shareholders and bondholders can be reduced either by counting multifaceted provisions, i.e., bond covenants, security and call and conversion features, or by restricting the maturity of debt Bodie and Taggart 1978; Haugen and Senbet 1978; Myers 1977). Easterwood and Kadapakkam (1994) documented that risky debt is the cause of agency conflicts between shareholders and bondholders.

Previous literature shows relationships between growth, leverage, debt maturity, growth opportunities, firm value and underinvestment for different markets, but the interaction among these variables is missing in the previous studies. This paper investigates the relationships between

leverage, investment, growth opportunities, debt maturity, and firm value in consideration of the underinvestment problem in non-financial firms of Pakistan. Based on the gap in existing literature, the following hypotheses are empirically tested to discuss the underinvestment incentive and liquidity risk in this study:

**H1:** There is a positive relationship between growth opportunities and leverage.

**H2:** There is a negative relationship between growth opportunities and debt maturity.

**H3:** There is a negative relationship between the leverage and debt maturity.

**H4:** There is a positive relationship between the growth opportunities on investment and firm value.

**H5:** There is a positive relationship between the investment and debt maturity.

**H6:** There is a positive relationship between the firm value and investment.

## 3. Data and Methodology

In this study, the model consists of five major determinants of debt policy. Taking each variable as a dependent variable one-by-one, the other four variables are regressed as independent variables on their respective dependent variable. The control variables are also included in the model. This delivers four simultaneous regression equations and the estimates of leverage, debt maturity, investment and firm value.

### *3.1. Leverage Equation*

In the leverage equation, leverage has been taken as a dependent variable. It is defined as the book value of debt divided by the total debt plus market value of equity (Dang, 2011). The leverage equation has been formed using the model used by Ozkan (2001) and Dang (2011). Furthermore, there is an interaction between growth opportunity and maturity (GTH*MAT) and $X^{LEV}$ a vector of i x k which consists of four control variables, i.e., size, profitability, tangibility and non-debt tax shield. The interaction term is previously used by Johnson (2003) and Dang (2011) in their models.

$$LEV_{i,t} = \alpha_0 + \lambda_{LEV} LEV_{i,t-1} + \alpha_1 MAT_{i,t} + \alpha_2 GTH_{i,t} + \alpha_3 FV_{i,t} + \alpha_4 (GTH \times MAT)_{i,t} + X^{LEV}{}_{I,t}\alpha^{LEV} + u_{i,t} \quad (1)$$

Debt maturity is defined as the long-term liability divided by the total outstanding debt. Growth opportunities are measured as the market value of equity plus book value of debt divided by total assets. Firm value is calculated as market value of cap plus minority interest, preferred stock and total debt minus the cash and cash equaling and lagged value capital expenditure plus depreciation divided by the total asset as a tool of investment measurement. Tangibility can be expressed as the ratio of fixed asset divided by total asset. Profitability is ratio of EBIT and total asset; size measured the lagged value of total asset and non-debt tax shield, the ratio of depreciation and total value of asset.

### *3.2. Debt Maturity Equation*

The explanatory instrument of the Debt Maturity Equation are leverage, growth opportunities, firm value and a vector (X) consisting of six determinants of debt maturity: firm size, firm quality, tax ratio, asset maturity structure, term structure of interest, and volatility (Antoniou et al., 2006).

$$MAT_{i,t} = \gamma_0 + \lambda_{MAT} MAT_{i,t-1} + \gamma_1 LEV_{i,t} + \gamma_2 GTH_{i,t} + \gamma_3 FV_{i,t} + \gamma_4 (GTH \times LEV)_{i,t} + X^{MAT}{}_{I,t}\gamma^{MAT} + u_{i,t} \quad (2)$$

Asset maturity structure is defined as the net property plant equipment divided by depreciation. Interest rate differential is an interest rate of a ten-year government bond and three-year commercial papers or treasury bills. Tax paid divided by the pre-tax income is the measure of tax ratio. Volatility of cash flow can be explained as the EBITDA plus depreciation divided by the total asset.

### *3.3. Investment Equation*

In this model, investment is a dependent variable and the variables of debt maturity, firm value, growth opportunity and leverage are regressed. Investment can be defined as the value which is obtained by dividing the capital expenditure plus depreciation by the total asset. Moreover, the investment equation has two interaction terms: growth opportunity × leverage and growth opportunity × debt maturity.

$$INV_{i,t} = \delta_0 + \lambda_{INV} INV_{I,t-1} + \delta_1 LEV_{i,t} + \delta_2 MAT_{i,t} + \delta_3 GTH_{i,t} + \delta_4 FV_{i,t} + \delta_5 GTH \times LEV_{i,t} + \delta_6 (GTH \times MAT)_{i,t} + \delta_7 CF_{i,t} + \mu_{i,t} \quad (3)$$

Where CF cash flow is an additional explanatory variable and $\mu_{i,t}$ is the error term with respect to a specific industry.

### *3.4. Firm Value Equation*

In this model, firm value is dependent on the debt maturity, investment, investment to growth, leverage. Three interaction terms are explanatory variables and two interaction terms areGTH × LEV and GTH × MAT.

$$FV_{i,t} = ß_0 + \lambda_{FV}FV_{i,t-1} + ß_1LEV_{i,t} + ß_2GTH_{i,t} + ß_3MAT_{i,t} + ß_4INV_{i,t} + ß_5 (GTH \times LEV)_{i,t} + ß_6 (GTH\times MAT)_{i,t} + X^{FV}{}_{I,t}ß_7^{FV} + \mu_{i,t} \quad (4)$$

### *3.5. Data*

This study examined unbalanced panel data of non-financial, Pakistani firms listed in the KSE 100 Index. Data have been collected from yearly financial statements of the companies, database of State Bank of Pakistan (SBP ) and the KSE 100 Index. Financial sector firms are not included in our sample. The companies that have four-year data are included in the dataset. Finally, the variables at the 1st and 99th percentile are removed as outliers. Our panel data consist of 427 firms from 12 major sectors of Pakistan, taking 4270 observations from 1999 to 2008.

### *3.6. Methodology*

In four simultaneous equations our dynamic partial model was applied, and the lagged value of the endogenous variable was added in the explanatory variables. This model is more appropriate for dynamic rather than static panels (Antoniou, Guney, and Paudyal 2006). The two-stage estimation approach is the commonly-used measure to identify the most accurate instrument for the endogenous variables. To improve the efficiency of the estimation, we adopted IV and (GMM) generalized method of movement second stage estimation. To run IV, the second lagged value of endogenous variables was used as an instrument. In IV, the approach of the dynamic first difference of value is to eliminate the potential correlation with the lagged dependent variable, e.g., the second lagged $MAT_{i,t-2}$ is the instrument of the first lagged value, $MAT_{i,t-1}$.This approach has been set for the other three equations: leverage, investment and firm value.

To check the robustness of the results, we also ran the two-step GMM for improving the efficiency of IV estimation.

## 4. Empirical Results

Table 1 presents the summary of descriptive statistics of all variables used in this study.

**Table 1 - Summary Statistics**

| Variable | Obs | Mean | Std.Dev | Min | Max |
|---|---|---|---|---|---|
| Debt Maturity | 2087.000 | 0.263 | 0.190 | 0.000 | 0.779 |
| | | | | | |
| Leverage | 2047.000 | 0.829 | 1.157 | (1.457) | 6.135 |
| Investment | 3240.000 | 0.058 | 0.441 | (1.194) | 2.654 |
| Firm Value | 3856.000 | 2247.794 | 5015.424 | 0.710 | 48941.070 |
| Growth Opportunity | 3823.000 | 0.950 | 0.883 | (8.346) | 1.848 |
| Leverage Growth | 2026.000 | 1.371 | 1.765 | (0.277) | 11.791 |
| | | | | | |
| Debt Maturity | 2026.000 | 0.267 | 0.211 | (0.249) | 0.808 |
| Tax Ratio | 3397.000 | 0.433 | 6.909 | (1.222) | 380.525 |
| Cash Flow | 3783.000 | 0.129 | 0.114 | (0.239) | 0.633 |
| Profitability | 3817.000 | 0.067 | 0.125 | (0.336) | 0.596 |
| Size | 3870.000 | 2.880 | 0.705 | 0.079 | 4.756 |
| | | | | | |
| Assets Maturity | 3808.000 | 17.245 | 21.211 | 0.348 | 288.308 |
| Earning Volatility | 3251.000 | 0.188 | 2.495 | (14.344) | 17.093 |
| Tangibility | 3868.000 | 0.516 | 0.235 | 0.001 | 0.976 |
| Term Structure | 2989.000 | 0.025 | 0.011 | 0.014 | 0.043 |
| None Debt Tax Shield | 3807.000 | 0.039 | 0.021 | 0.000 | 0.102 |
| | | | | | |
| Firm Quality | 3221.000 | 169.753 | 1883.740 | (4650.800) | 44367.510 |

### *4.1. Empirical Results of Leverage Equation*

Table 2 and 3 shows the empirical finding of the IV approach and the two-step GMM results.

## Table 2 - Regression Results for the Leverage Equation IV (2SLS) Estimation

| Leverage | Sign | M(1) | | | M(2) | | | M(3) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Coef. | Z | P-Value | Coef. | Z | P-Value | Coef. | Z | P-Value |
| Leverage L1. | + | 0.346 | 0.570 | 0.570 | 0.346 | 0.580 | 0.560 | 0.403 | 0.500 | 0.619 |
| | | (0.609) | | | (0.593) | | | (0.810) | | |
| Debt Maturity | +/- | 1.953* | 1.940 | 0.053 | (0.114)* | (0.390) | 0.693 | (2.664)* | (1.650) | 0.099 |
| | | (1.008) | | | (0.289) | | | (1.614) | | |
| Investment | + | 0.785 | 1.100 | 0.270 | 0.729 | 1.100 | 0.272 | 1.030 | 1.190 | 0.232 |
| | | (0.712) | | | (0.664) | | | (0.863) | | |
| Firm Value | +/- | 0.000 | 0.140 | 0.890 | (0.000) | (0.410) | 0.682 | 0.000 | 0.400 | 0.688 |
| | | (0.000) | | | (0.000) | | | (0.000) | | |
| Growth Opportunities | + | 2.863** | 2.710 | 0.007 | 2.713** | 3.230 | 0.001 | | | |
| | | (1.057) | | | (0.840) | | | | | |
| Debt Maturity Growth | -/+ | (1.646)** | (2.020) | 0.043 | | | | 2.471** | 1.400 | 0.160 |
| | | (0.813) | | | | | | (1.760) | | |
| Size | - | (0.287) | (0.630) | 0.525 | (0.798) | (2.350) | 0.019 | 0.130 | 0.170 | 0.868 |
| | | (0.453) | | | (0.339) | | | (0.782) | | |
| Profitability | - | (0.936)*** | (3.470) | 0.001 | (0.567)*** | (1.560) | 0.120 | (0.161)*** | (0.310) | 0.754 |
| | | (0.270) | | | (0.365) | | | (0.512) | | |
| Tangibility | + | (0.103) | (0.300) | 0.761 | (0.067) | (0.130) | 0.899 | (0.418) | (0.950) | 0.341 |
| | | (0.340) | | | (0.525) | | | (0.439) | | |
| None Debt Tax Shield | + | 4.825 | 1.250 | 0.212 | 6.083 | 0.800 | 0.424 | 5.237 | 1.010 | 0.311 |
| | | (3.870) | | | (7.612) | | | (5.169) | | |

Table 2 reports the regression results of the leverage equation using the IV approach. In this approach, the second lagged leverage value is used as an instrument of first lagged leverage value. We have run the empirical model three times. The models M(1), M(2), and M(3) of table 2 report the empirical results of baseline model, the model in the absence of growth opportunities and the model of interaction term of growth opportunities with debt maturity respectively. The control variables of the leverage equation are size, profitability, tangibility and non-debt tax shield. Year dummies are not incorporated in this empirical model. Standard errors are presented in parenthesis. Symbols *, ** and *** indicate the significance of the coefficients of variables at the 10%, 5% and 1% levels of significance respectively.

## Table 3 - Regression Results for the Leverage Equation 2-Step GMM Estimation

| Leverage | Sign | M(1) | | | M(2) | | | M(3) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Coef. | Z | P-Value | Coef. | Z | P-Value | Coef. | Z | P-Value |
| Leverage L1 | + | 0.393 | 1.330 | 0.183 | 0.386 | 1.170 | 0.242 | 0.426 | 1.350 | 0.178 |
| | | (0.295) | | | (0.330) | | | (0.316) | | |
| Debt Maturity | - | (0.184) | (0.400) | 0.691 | (0.759) | (2.860) | 0.004 | (2.339) | (2.920) | 0.004 |
| | | (0.463) | | | (0.265) | | | (0.801) | | |
| Investment | + | 0.676*** | 2.760 | 0.006 | 0.673*** | 2.590 | 0.010 | 0.829*** | 3.260 | 0.001 |
| | | (0.245) | | | (0.260) | | | (0.254) | | |
| Firm Value | + | 0.000** | 2.260 | 0.024 | 0.000** | 0.300 | 0.765 | 0.000** | 1.180 | 0.239 |
| | | (0.000) | | | (0.000) | | | (0.000) | | |
| Growth Opportunities | + | 1.570 | 4.580 | 0.000 | 1.548 | 4.090 | 0.000 | | | |
| | | (0.343) | | | (0.379) | | | | | |
| Debt Maturity Growth | +/- | (0.263) | (0.510) | 0.607 | | | | 1.940 | 2.340 | 0.019 |
| | | (0.512) | | | | | | (0.829) | | |
| Size | -/+ | (0.997)*** | (2.890) | 0.004 | (0.993)*** | (2.890) | 0.004 | 0.305*** | 0.930 | 0.352 |
| | | (0.344) | | | (0.344) | | | (0.327) | | |
| Profitability | - | (0.251) | (0.710) | 0.477 | (0.032) | (0.070) | 0.941 | (0.621) | (1.470) | 0.143 |
| | | (0.353) | | | (0.428) | | | (0.424) | | |
| Tangibility | -/+ | (0.358) | (0.960) | 0.339 | (0.309) | (0.680) | 0.494 | 6.345 | 2.530 | 0.011 |
| | | (0.374) | | | (0.451) | | | (2.503) | | |
| None Debt Tax Shield | +/- | 4.322* | 1.920 | 0.055 | 5.512* | 1.910 | 0.056 | (0.351)* | (0.830) | 0.408 |
| | | (2.252) | | | (2.885) | | | (0.424) | | |

In first equation, the leverage has been regressed on debt maturity, investment, growth opportunities and the interaction term of growth opportunities with debt maturity. The IV approach estimation results presented in Table 2 and Table 3 report the results of the two-step GMM. The empirical model was tested three times. The models M(1), M(2), and M(3) of table 3 report the empirical results of the baseline model, the model in the absence of growth opportunities and the model of the interaction term of growth opportunities with debt maturity respectively. In the GMM estimation method, the third to sixth lagged leverage was used as an instrument of first lagged leverage. The instruments of debt maturity are asset maturity structure and term structure which follow the literature as mentioned in the Chapter 3 to better fit the model. Year dummies have not been incorporated in all baseline and restricted models. Standard errors are presented in parenthesis. Symbols *, ** and *** indicate the significance of the coefficients of variables at the 10%, 5% and 1% levels of significance respectively.

Table 2 reports the regression results of leverage equation using the IV approach. In this approach, the second lagged leverage value has been used as an instrument of the first lagged leverage value. We ran the empirical model three times for both tables. The models M(1), M(2), and M(3) of table 2 report the empirical results of the baseline model, the model in the absence of growth opportunities and the model of interaction term of growth opportunities with debt maturity, respectively.

In the GMM estimation method, the third to sixth lagged leverage has been used as an instrument of first lagged leverage. Growth opportunities are positively significant in the IV approach and the GMM estimator. These findings are consistent with the existing literature (Myers; 1977) (Johnson, 2003; Ozkan, 2001), in that growth opportunities have a direct relationship with leverage and support the underinvestment hypothesis In the two-step GMM table, the variable investment of the firm and value of the firm has a significant relationship with the leverage.

### *4.2. Empirical Equation of Debt Maturity Equation*

Table 4 reports the IV approach and Table 5 presents the two-step GMM estimator.

**Table 4 - Regression Results for the Debt Maturity Equation IV (2SLS) Estimation**

| Debt Maturity | Sign | M(1) | | | M(2) | | | M(3) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Coef. | Z | P-Value | Coef. | Z | P-Value | Coef. | Z | P-Value |
| Debt Maturity L1. | - | (0.448) | (0.270) | 0.789 | (0.430) | (0.320) | 0.750 | (0.452) | (0.280) | 0.780 |
| | | (1.669) | | | (1.348) | | | (1.622) | | |
| Leverage | - | (0.035)* | (0.040) | 0.970 | (0.095)* | (0.370) | 0.715 | (0.049)* | (0.050) | 0.962 |
| | | (0.951) | | | (0.261) | | | (1.041) | | |
| Investment | + | 0.118*** | 2.110 | 0.035 | 0.119*** | 1.800 | 0.072 | 0.118*** | 2.200 | 0.028 |
| | | (0.056) | | | (0.066) | | | (0.054) | | |
| Firm Value | + | 0.000** | 2.460 | 0.014 | 0.000** | 1.850 | 0.065 | 0.000** | 2.530 | 0.011 |
| | | (0.000) | | | (0.000) | | | (0.000) | | |
| Growth Opportunities | +/- | (0.021) | (0.040) | 0.965 | 0.020 | 0.020 | 0.984 | | | |
| | | (0.484) | | | (1.028) | | | | | |
| Leverage Growth | - | (0.035) | (0.050) | 0.959 | | | | (0.029) | (0.040) | 0.969 |
| | | (0.688) | | | | | | (0.737) | | |
| Tax Ratio | + | 0.018 | 0.880 | 0.377 | 0.018 | 0.860 | 0.389 | 0.018 | 0.880 | 0.377 |
| | | (0.021) | | | (0.021) | | | (0.021) | | |
| Size | - | (0.323) | (1.590) | 0.112 | (0.322) | (1.550) | 0.120 | (0.326) | (1.600) | 0.109 |
| | | (0.203) | | | (0.207) | | | (0.203) | | |
| Earning Volatility | + | 0.009 | 0.970 | 0.331 | 0.009 | 1.010 | 0.313 | 0.009 | 0.980 | 0.329 |
| | | (0.009) | | | (0.009) | | | (0.009) | | |
| Firm Quality | - | (0.000)* | (1.890) | 0.058 | (0.000)* | (1.890) | 0.058 | (0.000)* | (1.870) | 0.061 |
| | | (0.000) | | | (0.000) | | | (0.000) | | |
| Assets Maturity Structure | - | (0.005)** | (3.100) | 0.002 | (0.005)** | (2.490) | 0.013 | (0.005)** | (3.170) | 0.002 |
| | | (0.002) | | | (0.002) | | | (0.001) | | |
| Term Structure | - | (0.987) | (0.470) | 0.637 | (0.942) | (0.370) | 0.710 | (0.980) | (0.480) | 0.634 |
| | | (2.093) | | | (2.535) | | | (2.058) | | |

**Table 5 - Regression Results for the Debt Maturity Equation 2-Step GMM Estimation**

| | | M(1) | | | M(2) | | | M(3) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Debt Maturity** | **Sign** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** |
| Debt Maturity L1. | +/- | 0.001*** | 0.000 | 0.998 | 0.068*** | 0.000 | 0.837 | (0.045)*** | (0.140) | 0.892 |
| | | (0.333) | | | (0.332) | | | (0.329) | | |
| Leverage | - | (0.306) | (0.840) | 0.402 | (0.028) | (0.620) | 0.535 | (0.117) | (1.100) | 0.273 |
| | | (0.365) | | | (0.046) | | | (0.106) | | |
| Investment | + | 0.089 | 1.470 | 0.142 | 0.061 | 1.450 | 0.146 | 0.077 | 1.330 | 0.183 |
| | | (0.061) | | | (0.042) | | | (0.058) | | |
| Firm Value | + | 0.000** | 1.990 | 0.046 | 0.000** | 2.310 | 0.021 | 0.000** | 1.960 | 0.050 |
| | | (0.000) | | | (0.000) | | | (0.000) | | |
| Growth Opportunities | +/- | 0.241 | 0.510 | 0.608 | (0.025) | (0.130) | 0.899 | | | |
| | | (0.470) | | | (0.193) | | | | | |
| Leverage Growth | + | 0.140 | 0.780 | 0.435 | | | | 0.049 | 0.770 | 0.443 |
| | | (0.179) | | | | | | (0.064) | | |
| Tax Ratio | - | (0.031)** | (2.270) | 0.023 | (0.033)** | (2.510) | 0.012 | (0.031)** | (2.220) | 0.027 |
| | | (0.014) | | | (0.013) | | | (0.014) | | |
| Size | - | (0.377) | (1.580) | 0.114 | (0.383) | (1.710) | 0.087 | (0.327) | (1.470) | 0.141 |
| | | (0.238) | | | (0.224) | | | (0.222) | | |
| Earning Volatility | + | 0.030*** | 3.150 | 0.002 | 0.032*** | 3.370 | 0.001 | 0.029*** | 3.140 | 0.002 |
| | | (0.010) | | | (0.009) | | | (0.009) | | |
| Firm Quality | - | (0.000)* | (2.320) | 0.020 | (0.000)* | (2.090) | 0.037 | (0.000)* | (2.450) | 0.014 |
| | | (0.000) | | | (0.000) | | | (0.000) | | |
| Assets Maturity Structure | + | 0.001 | 0.200 | 0.839 | 0.001 | 0.260 | 0.794 | 0.001 | 0.400 | 0.693 |
| | | (0.003) | | | (0.003) | | | (0.003) | | |
| Term Structure | + | 39.654*** | 2.610 | 0.009 | 38.725*** | 2.610 | 0.009 | 38.631*** | 2.570 | 0.010 |
| | | (15.196) | | | (14.865) | | | (15.059) | | |

Tables 4 and 5 report the estimation of regression results of debt maturity on lagged debt maturity, firm value, leverage, investment, growth opportunities and interaction term of growth opportunities with leverage. The models M(1), M(2), and M(3) of table 5 report the empirical results of the baseline model, the model in the absence of growth opportunities and the model of the interaction term of growth opportunities with leverage respectively. Year dummies are not included in the model. Standard errors are presented in parenthesis. Symbols *, ** and *** indicate the significance of the coefficients of variables at the 10%, 5% and 1% levels of significance respectively.

The control variable, firm quality and asset maturity structure are significant at 10% and 1% in the IV approach. Regarding the control variables, firm quality, earning volatility and term structure are significant in the two-step GMM estimator. Growth opportunities and its interaction term with leverage have no economic significant relationship with debt maturity in all six empirical models. These results are consistent with the findings of other recent research (Dang, 2011).

At 10% significance level, leverage has an economic relationship while using the IV approach and has no relationship in the GMM estimator. The relationship of leverage is significant in the first three models., The relationship is negative which is consistent with the results of Johnson (2003). Furthermore, the growth opportunities gets significance in other modified models because of the potential attenuation effect.

### *4.3. Empirical Results of Investment Equation*

Table 6 reports the IV estimation results and Table 7 presents the two-stage GMM estimator.

## Table 6 - Regression Results for the Investment Equation IV (2SLS) Estimation

| | | M(1) | | | M(2) | | | M(3) | | | M(4) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Investment** | **Sign** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** |
| Investment L1. | - | (0.391) | (0.420) | 0.671 | (0.436) | (0.660) | 0.510 | (0.580) | (0.610) | 539.000 | 0.674 | 0.060 | 0.954 |
| | | (0.923) | | | (0.662) | | | (0.943) | | | (11.688) | | |
| Debt Maturity | + | 0.861 | 0.620 | 0.536 | | | | | | | 2.799 | 0.120 | 0.907 |
| | | (1.389) | | | | | | | | | (24.060) | | |
| Leverage | + | 0.625* | 2.070 | 0.039 | | | | 0.402* | 1.410 | 0.159 | 0.273* | 1.670 | 0.096 |
| | | (0.303) | | | | | | (0.285) | | | (0.164) | | |
| Firm Value | +/- | 0.000 | 0.500 | 0.615 | 0.000 | 0.560 | 0.576 | 0.000 | 0.720 | 0.474 | (0.000) | (0.050) | 0.964 |
| | | (0.000) | | | (0.000) | | | (0.000) | | | (0.000) | | |
| Growth Opportunities | + | 1.118** | 3.400 | 0.001 | 1.464** | 3.410 | 0.001 | 1.224** | 1.880 | 0.059 | 1.598** | 0.600 | 0.551 |
| | | (0.328) | | | (0.429) | | | (0.649) | | | (2.678) | | |
| Leverage Growth | -/+ | (0.215) | (1.150) | 0.250 | 0.163 | 5.880 | 0.000 | (0.096) | (0.470) | 0.636 | | | |
| | | (0.187) | | | (0.028) | | | (0.203) | | | | | |
| Debt Maturity Growth | -/+ | (0.613) | (0.410) | 0.679 | 0.177 | 0.780 | 0.438 | | | | (2.625) | (0.110) | 0.915 |
| | | (1.481) | | | (0.228) | | | | | | (24.546) | | |
| Cash Flow | +/- | 0.003 | 0.010 | 0.995 | 0.003 | 0.010 | 0.994 | 0.080 | 0.190 | 0.850 | (0.282) | (0.100) | 0.919 |
| | | (0.423) | | | (0.360) | | | (0.423) | | | (2.769) | | |

The investment is regressed on the first lagged value of investment, debt maturity, leverage, growth opportunities, investment and firm value also on their two interaction terms: the growth opportunities with leverage and the growth opportunities with debt maturity. The instrument of the second lagged investment was used as the instrument of first lagged investment in the IV estimation approach. The models M(1), M(2), M(3) and M(4) of table 6 are reported the empirical results of baseline model, the model in the absence of growth opportunities and the model of leverage and both interaction terms of growth opportunities with leverage as well as growth opportunities with debt maturity respectively. Year dummies are not included in the empirical model. Standard errors are presented in parenthesis. Symbols *, ** and *** indicate the significance of the coefficients of variables at the 10%, 5% and 1% levels of significance respectively.

## Table 7 - Regression Results for the Investment Equation 2-Step GMM Estimation

| | | M(1) | | | M(2) | | | M(3) | | | M(4) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Investment** | **Sign** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** |
| Investment L1. | -/+ | (0.328)* | (1.650) | 0.099 | (0.250)* | (1.300) | 0.194 | 0.127* | 0.480 | 0.631 | (0.470)* | (2.300) | 0.022 |
| | | (0.199) | | | (0.192) | | | (0.264) | | | (0.205) | | |
| Debt Maturity | - | (0.736) | (1.500) | 0.134 | | | | | | | (0.698) | (1.490) | 0.136 |
| | | (0.490) | | | | | | | | | (0.468) | | |
| Leverage | + | 0.421* | 1.650 | 0.099 | | | | 0.614* | 2.160 | 0.031 | 0.133* | 2.940 | 0.003 |
| | | (0.255) | | | | | | (0.284) | | | (0.045) | | |
| Firm Value | + | 0.000** | 2.280 | 0.022 | 0.000** | 1.750 | 0.080 | 0.000** | 0.770 | 0.439 | 0.000** | 2.730 | 0.006 |
| | | (0.000) | | | (0.000) | | | (0.000) | | | (0.000) | | |
| Growth Opportunities | + | 0.699** | 2.140 | 0.032 | 1.298** | 6.580 | 0.000 | 0.468** | 1.280 | 0.201 | 1.006** | 4.030 | 0.000 |
| | | (0.326) | | | (0.197) | | | (0.366) | | | (0.250) | | |
| Leverage Growth | -/+ | (0.171) | (1.170) | 0.242 | 0.037 | 1.530 | 0.127 | (0.291) | (1.810) | 0.071 | | | |
| | | (0.146) | | | (0.024) | | | (0.161) | | | | | |
| Debt Maturity Growth | + | 0.964** | 2.020 | 0.043 | 0.291** | 2.060 | 0.039 | | | | 0.978** | 2.160 | 0.031 |
| | | (0.477) | | | (0.141) | | | | | | (0.453) | | |
| Cash Flow | + | 0.090 | 0.440 | 0.659 | 0.076 | 0.350 | 0.725 | 0.061 | 0.230 | 0.815 | 0.057 | 0.290 | 0.771 |
| | | (0.203) | | | (0.215) | | | (0.261) | | | (0.197) | | |

The two stage estimation regression result of investment equation (3) is reported in above tables. The investment regressed on the lagged value of investment, leverage, debt maturity, firm value, growth opportunities and two interaction terms. The investment equation has kept only one control variable which is cash flow to follow the literature. The M(1), M(2), M(3) and M(4) of table 7 are reported the empirical results of the baseline model, the model in the absence of growth opportunities and the model of leverage and both the interaction terms of growth opportunities with leverage as well as growth opportunities with debt maturity respectively. In the two-step GMM estimation approach, the instrument of lagged investment is third lagged to sixth lagged investment in the two-stage estimation. The instrument of debt maturity and leverage is applied in the model for better fit. Years dummies are not considered in the model. Standard errors are presented in parenthesis. Symbols *, ** and ** indicate the significance of the coefficients of variables at the 10%, 5% and 1% levels of significance respectively.

The investment equation regresses four times. The first regression is the baseline specification. Secondly, both the debt maturity and leverage are excluded from the model. In the third attempt, the model excludes the debt maturity and its interaction term growth opportunities from the original model. Finally, the interaction term of growth opportunities with leverage are absent from the baseline model. In all the eight models, the control variable cash flow does not reach significance with investment. Although it fails to reach significance, its positive direction is consistent with the literature (Aivazian, Ge, & Qiu, 2005), and (Dang, 2011).

In the two-step GMM estimation approach, the instrument of lagged investment is third lagged to sixth lagged investment in the two-stage estimation. The instrument of debt maturity and leverage is applied in the model for better fit. At a 10% significance level, leverage has a significantly positive economic relationship with the investment in both baseline models. Leverage is also significant at 5%, 1% in the third and fourth model of the two-step GMM estimator. These results are inconsistent with the (Aivazian, Ge, & Qiu, 2005; Dang, 2011). Leverage and investment have negative relationships which support the underinvestment hypothesis. These results are reported from all eight models which are inconsistent with the results of (A Aivazian; Y Ge; J Qiu; 2005)The interaction term of growth opportunities and debt maturity is positively significant at the 5% significance level in all models of Table 7.

**Table 8 - Regression Results for the Firm Value Equation IV (2SLS) Estimation**

| | | M(1) | | | M(2) | | | M(3) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Firm Value** | **Sign** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** |
| Firm Value L1. | + | 0.762*** | 14.610 | 0.000 | 0.769*** | 14.980 | 0.000 | 0.794*** | 15.440 | 0.000 |
| | | (0.052) | | | (513185.000) | | | (0.051) | | |
| Debt Maturity | -/+ | (1038.480) | (1.130) | 0.259 | (1025.680) | (1.160) | 0.247 | 614.581 | 1.830 | 0.067 |
| | | (919.188) | | | (886.611) | | | (335.786) | | |
| Leverage | -/+ | (700.592) | (1.420) | 0.157 | 116.880 | 1.350 | 0.177 | (517.161) | (0.950) | 0.340 |
| | | (494.695) | | | (86.509) | | | (542.554) | | |
| Investment | + | 539.011*** | 4.970 | 0.000 | 485.485*** | 4.740 | 0.000 | 642.422*** | 5.470 | 0.000 |
| | | (108.502) | | | (102.384) | | | (117.363) | | |
| Growth Opportunities | - | (539.564) | (0.830) | 0.408 | (1332.034) | (2.880) | 0.004 | (367.086) | (0.550) | 0.579 |
| | | (651.438) | | | (461.907) | | | (661.651) | | |
| Leverage Growth | + | 457.326* | 1.650 | 0.099 | | | | 323.061* | 1.070 | 0.286 |
| | | (277.475) | | | | | | (302.954) | | |
| Debt Maturity Growth | + | 1175.175 | 1.420 | 0.156 | 1190.841 | 1.480 | 0.139 | | | |
| | | (828.990) | | | (803.966) | | | | | |
| Size | + | 2167.221*** | 5.250 | 0.000 | 2268.014*** | 5.550 | 0.000 | 2329.558*** | 5.350 | 0.000 |
| | | (412.623) | | | (408.849) | | | (435.063) | | |
| Profitability | + | 244.991 | 0.420 | 0.674 | 323.909 | 0.580 | 0.565 | 41.689 | 0.070 | 0.947 |
| | | (582.767) | | | (562.234) | | | (623.327) | | |
| Tangibility | - | (187.456) | (0.370) | 0.712 | (168.977) | (0.340) | 0.733 | (670.407) | (1.220) | 0.224 |
| | | (507.707) | | | (495.910) | | | (550.902) | | |
| Firm Quality | + | 0.142*** | 5.060 | 0.000 | 0.144*** | 5.170 | 0.000 | 0.119*** | 4.020 | 0.000 |
| | | (0.028) | | | (0.028) | | | (0.030) | | |

Firm value has empirically regressed on the lagged firm value, leverage, debt maturity and investment and interaction term of growth opportunities with debt maturity and leverage. Consistent with the literature, the second lagged firm value has been used as an instrument of the first lagged firm value. The four control variables included in the firm value equation are size, tangibility, profitability, and firm quality. The baseline model was presented in the first three columns M(1) and rest of six columns(2), M(3) reported the other two restricted empirical models. Year dummies are not part of this model. Standard errors are presented in parenthesis. Symbols *, ** and *** indicate the significance of the coefficients of variables at the 10%, 5% and 1% levels of significance respectively.

## Table 9 - Regression Results for the Firm Value Equation 2-Step GMM Estimation

| | | M(1) | | | M(2) | | | M(3) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Firm Value** | **Sign** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** | **Coef.** | **Z** | **P-Value** |
| Firm Value L1. | + | 0.846*** | 4.660 | 0.000 | 0.862*** | 4.580 | 0.000 | 0.741*** | 4.260 | 0.000 |
| | | (0.182) | | | (0.188) | | | (0.174) | | |
| Debt Maturity | -/+ | (1635.695)** | (2.320) | 0.021 | (1873.513)** | (2.650) | 0.008 | 31.345** | 0.060 | 0.949 |
| | | (706.207) | | | (706.571) | | | (490.378) | | |
| Leverage | + | 708.228 | 1.050 | 0.293 | 178.240 | 1.880 | 0.060 | 541.409 | 0.810 | 0.420 |
| | | (674.174) | | | (94.626) | | | (671.343) | | |
| Investment | + | 709.018*** | 3.320 | 0.001 | 633.319*** | 3.360 | 0.001 | 798.435*** | 3.120 | 0.002 |
| | | (213.735) | | | (188.444) | | | (256.288) | | |
| Growth Opportunities | - | (2107.407) | (2.700) | 0.007 | (1723.336) | (3.180) | 0.001 | (1790.335) | (2.310) | 0.021 |
| | | (779.303) | | | (541.786) | | | (774.042) | | |
| Leverage Growth | + | 315.133 | (0.890) | 0.375 | | | | 253.246 | (0.700) | 0.482 |
| | | (355.108) | | | | | | (360.462) | | |
| Debt Maturity Growth | + | 1256.172* | 1.890 | 0.059 | 1482.894* | 2.240 | 0.025 | | | |
| | | (664.911) | | | (663.421) | | | | | |
| Size | + | 1665.039 | 1.310 | 0.189 | 1465.587 | 1.100 | 0.271 | 2674.788 | 1.930 | 0.053 |
| | | (1267.630) | | | (1331.407) | | | (1384.740) | | |
| Profitability | +/- | 78.472 | 0.200 | 0.840 | 336.927 | 0.880 | 0.378 | (257.309) | (0.450) | 0.653 |
| | | (387.506) | | | (382.151) | | | (572.822) | | |
| Tangibility | + | 1078.343 | 1.260 | 0.207 | 1163.995 | 1.380 | 0.167 | 568.795 | 0.450 | 0.649 |
| | | (854.974) | | | (841.804) | | | (1251.498) | | |
| Firm Quality | + | 0.098* | 1.930 | 0.053 | 0.096* | 1.840 | 0.066 | 0.077* | 1.570 | 0.117 |
| | | (0.051) | | | (0.052) | | | (0.049) | | |

Firm value was empirically regressed on the lagged firm value, leverage, debt maturity and investment and interaction term of growth opportunities with debt maturity and leverage. The four control variables included in the firm value equation are size, tangibility, profitability, and firm quality. The baseline model was presented in the first three columns M(1) and M(2), M(3). The rest of the six columns report the other two restricted empirical models. In two-step GMM, the third to fifth lagged is used as an instrument of firm first lagged of firm value. The instrument of debt maturity is leverage as similar of investment equation. There are five variables used as an instrument for better fit i.e. term structure, asset maturity structure, non-debt tax shield, and tangibility. Year dummies are not excluded from all six models. Standard errors are presented in parenthesis. Symbols *, ** and *** indicate the significance of the coefficients of variables at the 10%, 5% and 1% levels of significance respectively.

Lagged firm value is highly significant in all the six models at the 1% significance level. Based on the IV approach, firm size and firm quality are economically significant with the firm value. Firm quality is also significant at the 10% level in the results of the two-step GMM.

In the two-step GMM, first lagged of firm value is positively significant at the 1% level in all the models and debt maturity is negatively significant at the 5% level in model (1). This variable is significant and positive at the 1% level in model (2) and has no economic relationship in model (3) due to the potential attenuation effect. The previous literature suggests that debt maturity affects the firm value where managers have more information than the outside investors.

Leverage does not reach significance in any of the models except model (2) of the two-step GMM. The past iterature suggests that leverage has a positive relationship when the firm recognizes the potential investment opportunities or discourage the debt overhang. The relationship becomes negative when the firm does not accept the investment opportunities (Lang et al., 1996). Growth opportunities are negatively significant at the 1% level in all the (6) models.

## 5. Final Conclusion and Discussion

This paper investigated the growing trend of research on the interaction between firms' investment and financial decisions in the presence of the underinvestment problem. This research has addressed three main research questions. First, debt maturity and leverage are complements of each other, or not substitute to mitigate the underinvestment risk in the scenario of Pakistani firms. Second, it has examined the potential correlation among the firm's financing and investment decision. Thirdly, it examined how this interaction addresses the underinvestment and liquidity risk of non-financial Pakistani listed firms. Finally, the study investigated how growth firms mange the firm value using the mixed of debt maturity and leverage strategy.

This paper found that growth opportunities have a positive relationship with leverage. Firms in growth are more dependent on external funds, so we concluded that growth firms adopted the high leverage strategy which is consistent with the underinvestment hypothesis (Myers, 1977). The debt maturity and leverage have an economic significant relationship which supports these arguments. The debt maturity and leverage are complements and never substitute to

control the underinvestment and liquidity risk. These results are consistent with the previous literature (Aivazian et al., 2005) and (Dang, 2011). Avoidance of <insert variable here> was found by Pakistani firms that was not planned before the growth opportunities. This may be done to adopt the low leverage strategy ex ante to capture the growth opportunities ex post. This study also empirically investigated that the Pakistani firms do not use properly the structure of debt maturity to mitigate the potential risk. However the investment has a weak but significant relationship with the debt maturity. Further study should be conducted on the overinvestment problem, bondholder and underinvestment incentive, derivative and under/overinvestment problem, especially from the Pakistani perspective.

## 6. Policy Recommendation

Debt maturity and leverage are complements, not substitutes of each other in the design of the financial and investment policy. Both strategic variables played an important role to mitigate the underinvestment risk and liquidity risk. For high growth, firms must give more importance to the underinvestment risk, and for low growth, firms more focus on liquidity risk. Firms with high growth should rely more on low leverage strategy ex ante to anticipate the future growth opportunities ex post. This study found that leverage has a negative relationship with debt maturity which enhances the liquidity risk. Pakistani firms adopted the short-term debt to capture growth opportunities. Firms must use the debt maturity with respect to moderate the liquidity and underinvestment risk.

Furthermore, this study found that growth opportunities have a positively significant relationship with investment. Pakistani firms have not actively used the tool of debt maturity to mitigate the underinvestment or liquidity risk. Firms must adopt the low leverage strategy to anticipate the valuable growth opportunities. Debt maturity was found to have no economic significant relationship with investment with respect to non-financial, Pakistani sectors. Pakistani firms should actively consider the debt maturity structure to mitigate potential risk. It must also consider that these policy variables affect the firm value. Firms must set the capital structure and investment policy ex ante to capture the potential positive NPV projects which has the effect of avoiding the debt overhang and has a positive impact on firm value.

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# Do Investors Herd: Evidence from an Emerging Market

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**Abstract**

*Employing stock price data from a developing market, we examine whether investors' trading patterns are characterized as herd behavior at the market and industry levels. Unlike results for some developing markets, linear models of herd behavior find no evidence of herd formation, in any of the sectors, during periods of large market movements. However, non-linear models find significant non-linear herding behavior only for two sectors of the whole sample, and when we group the sub-samples based on up and down market movements. Overall, empirical results tend to support the notion of no herd formation in Pakistan's market. Two main explanations may be offered for the results: first, a developing market, characterized by thin trading and low turnover, with few of the stocks from various sectors actively traded in the market. Second, individual investors that dominate Pakistan's equity market and low levels of institutional investor's presence preclude herd formations.*

**Keywords:** Herd behavior, herding, institutional investors, cross-sectional standard deviation of returns

**JEL classifications:** G11, G12.

## 1. Introduction

The phenomenon of humans tending to mimic the behavior and actions of others has been observed in a variety of social and economic environments. This imitative and correlated behavior in financial markets, , referred to as herding by Nofsinger and Sias (1999), results in investor groups trading in the same direction over time. This tendency of investors to imitate the observed behavior of fellow investors carries an important implication for financial markets as herding implies that investors may be suppressing their private information (Hwang and Salmon, 2004). This can cause stock prices to deviate from their fundamental value. By contrast,

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herding can be rational, as with information-based herding (Welch, 1992)[1], or it can be rational in a "utility maximizing" sense, with the thinking that better informed participants in the market move away from the market consensus which can be costly in terms of reputation (Scharfstein and Stein, 1990) or loss of compensation (Roll, 1992).

Herding in financial markets is well-documented. Previous studies have predominantly focused on the investment behavior of institutional investors, mainly pension funds (Voronkova and Bohl, 2005; Badrinath and Wahal, 2002; Kremer and Nautz, 2011), fund managers (Liao, Huang, and Wu, 2011), mutual funds (Walter and Weber, 2006; Grinblat, Titman and Wermers, 1995) or foreign institutional investors (Shyu and Sun, 2010). This growing interest in the institutional investors' behavior is partly stimulated by their relative growing dominance in financial markets worldwide (Nofsinger and Sias, 1999), the possible influence of their trading patterns on asset prices, and, partly, the common perception that institutional investors engage more in herding and feedback trading than individual investors. Their actions may contribute to the destabilization of capital markets, diluting the information quality of prices and aggravating stock price volatility (Walter and Weber, 201006 Voronkova and Bohl, 2005). Nevertheless, some researchers (Natividad, Pilar and Sandra, 2011) argue that institutional investors are expected to be well-equipped, better informed (Li, Rhee and Wang, 2009), and have superior capabilities to better interpret the information as compared to other market participants so may not have incentive to engage in intentional herd behavior. Thus, studies on institutional herding find diverse results (Grinblatt, Titman and Wermers, 1995; Wermers, 1999; Li and Yung, 2004; Liao et al., 2011; Holmes, Kallinterakis and Ferreira, 2011). Hence, results from studies on the behavior of institutional investors has little relevance for individual investors. This necessitates the need to focus on the behavior of the individual retail investors in markets dominated by domestic individual investors. This study attempts to fill this gap by examining a developing market like Pakistan.

This study examines whether herding behavior exists at the overall market level and at the industry level. We know little about individual investment behavior in relation to the presence of herding in developing financial markets. This paper extends the literature to an emerging

[1] In this case, independent and informed investors such as institutional investors, take actions spurred by the movements in fundamentals. Bikhchandani and Sharma (2001) call this type of herding as "spurious" or "unintentional herding".

market—that dominated by individual retail investors, as compared to foreign or institutional investors.

Our study contributes to the literature on equity investors' herding behavior in several ways. There is limited and mixed evidence on herd behavior in emerging markets, and those studies are restricted only to a few markets, such as Taiwan, Hong Kong, South Korea, and few Latin American markets. The current study extends this literature to Pakistan's market in two distinct aspects namely, (i) market-wide and sector-specific evidence of herd behavior, and (ii) herd behavior within the same market, accounting for the thin trading phenomenon as a robustness check. Previous studies on Pakistan's market have not accounted for this anomaly. Although Javed et al., (2013), Shah et al. (2017), Javaira and Hassan (2015), Yousaf et al. (2018) examine herd behavior for Pakistan's market, our paper differs from these studies since we account for the phenomenon of thin trading. This helps to avoid confounding results with herding and thin trading. Finally, we use a sufficiently large sample interval to minimize the influence of any bias produced by any market effects.

The rest of the paper is organized as follows. Second section reviews relevant literature, followed by methodology and analysis, and the last section concludes the paper.

## 2. Literature Overview

Empirical examinations of herding in financial markets have been conducted along two distinct lines. The first line of research, pioneered by Christie and Hwang (1995), examines herd behavior based on the cross-sectional dispersion of stock returns in different extreme market conditions. In this model, Cross-Sectional Standard Deviation (CSSD) is regressed against two dummies that represent extreme positive and extreme negative returns. Chang et al. (2000) modified Christie and Hwang's model by using the absolute measure of CSSD to examine herding for the U.S. and some Asian markets. Christie and Hwang's model is based on the notion that, during normal market conditions, each asset will react to the aggregate changes in the market in its own specific way depending on its sensitivity to those changes, so we should observe substantial variation in CSSD of returns. When market participants are engaged in herd behavior individual stock returns tend to deviate little from the overall aggregate market returns. The resulting lower CSSDs in individual security returns is a sign of the presence of herd behavior. Hence, herd behavior and asset pricing models tend to differ in their

predictions of the behavior of stock return dispersion, particularly during market stress. These models have been applied in different markets, mainly during conditions of market stress, and for both institutional and individual investors. The evidence for herd behavior has predominantly been found in developing markets as compared to developed markets. For instance, Chang et al. (2000) report that investors in the U.S. and Hong Kong markets do not herd, while those of South Korea and Taiwan do herd significantly. Gleason et al. (2004) used Christie and Hwang's model for Exchange Traded Funds (ETFs) and find no evidence of herd behavior either during extreme up or extreme down market movements for ETFs. Demirer and Kutan (2006) have found no evidence of herd behavior for the Chinese market using firm- and sector-level data, during periods of extreme up and down markets. Conversely, Dorn, Hubberman, and Psengmuller (2003) found strong evidence of herd behavior for German retail investors at a German broker using daily and quarterly intervals.

Li, Rhee, and Wang (2009) document more intense herding by better-informed institutional investors as compared to individual investors. Nevertheless, their paper also documents the tendency for less-informed individual trader's to rely on public information and, consequently, their vulnerability to the influences of market sentiments and popular eye-catching events. Chiang and Zhen (2010) examine herding behavior in 18 countries using Christie and Hwang's model and have found evidence of herding behavior in Asian markets, but no evidence of herding in U.S. and Latin American markets. This herd behavior was found during both up and down markets, though the intensity was more pronounced for Asian markets, particularly during up markets.

In addition to Christie and Hwang's model, there is another model that has found widespread application in the literature on herd behavior, developed by Hwang and Salmon (2004). Though the spirit of this model is similar to that of Christie and Hwang, it is based on the CSSD of the factor sensitivity of assets, instead of the returns. This enables the model to avoid the influence of idiosyncratic components. Hwang and Salmon (2004) suggest that when investors herd, normal risk-return equilibrium in the conventional Capital Asset Pricing Model (CAPM) is disturbed which causes betas of the assets to move away from equilibrium, resulting in the CSSD to be smaller than what it would have been in equilibrium. Hwang and Salmon explain this bias in individual betas as a shift in beliefs which occurs because investors follow the sentiments of the market. Applying their model to the U.S. and South Korean equity markets, Hwang and Salmon found that herd behavior shows significant variation and

persistence over time, independent of given market conditions and macroeconomic factors, as these factors failed to explain any variations in the herding. Other studies that have used Hwang and Salmon's model include Demirer, Kutan, and Chen (2007) for Taiwanese firm-level data and have documented strong evidence of herding in all sectors of that market. Wang (2008) document higher levels of herd behavior for several emerging markets in Asia using Hwang and Salmon's model and Fama-French's three-factor model. Recently, Kallinterakis (2009) has extended the model to the Vietnam market and adjusts returns for thin trading—a feature of emerging markets. They found that adjustment for thin trading depresses herding significance in the market.

In summary, regardless of which model studies have used, results for the presence of herd behavior in different markets are mixed, and at times, elusive. Empirical evidence of the presence of herding in financial markets, however, tilts more towards developing markets.

## 3. Data and Methodology

We employed two empirical models in this study to evaluate herd behavior at the market-wide and industry-wide levels. These models are based on the Cross-Sectional Standard Deviation (CSSD) model of stock returns. Christie and Huang (1995) proposed this model to empirically identify herd behavior at the market-wide level by utilizing cross-sectional data on stock returns. Christie and Huang define CSSD by the following equation:

$$CSSD_t = \sqrt{\frac{\sum_{i=1}^{n}(r_{i,t}-r_{p,t})^2}{n-1}} \quad (1)$$

where $n$ is the number of stocks in the portfolio and $r_{i,t}(r_{p,t})$ is the realized individual security (equally-weighted portfolio) returns for day t.

The rationale behind this measure is that, in the presence of herd behavior, individual asset returns will move in tandem with overall market returns as investors suppress their own private information (opinion) and make investment decisions by following collective market actions. This would lead the CSSD among stocks to be lower than the usual dispersion and would be indicative of the presence of herd behavior

Christie and Huang's model also assumes that the tendency of investors to herd will be higher during extreme market movements, as they

will most likely suppress their opinion in favor of market consensus during such market conditions. Traditional asset pricing models and literature on herd behavior in financial markets have different predictions for the cross-sectional variations in asset returns. Classical asset pricing models predict that this cross-sectional variation will be higher during market stress because of the different sensitivities of assets to aggregate market changes. In contrast, market-wide herding behavior suggests that the dispersion will be lower during large market movements as there is a higher tendency that investors will be swept along with the collective market behavior. Hence, we also test for the presence of market herding during large market movements through the following equation of Christie and Huang's model.

$$CSSD_t = \propto + \gamma^L D_t^L + \gamma^U D_t^U + \varepsilon_t \quad (2)$$

where $D_t^L (D_t^U)$ is a dummy variable that is equal to market returns on a day $t$ fall in the extreme lower (upper) boundary of the returns distributions[2]. $CSSD_t$ represents cross-sectional dispersion of variations in asset returns as defined by equation (1) and $\propto$ represents mean dispersion for the sample, not including the days represented by the two dummies. Thus, the two dummies capture differential return dispersion between extreme up or down market movements and the normal market movements. Statistically significant negative (positive) coefficients for the two dummies will be indicative of the presence (absence) of herd behavior in the market during extreme up or down markets.

### *3.1. Asymmetric Behavior of Herding and herding under different market conditions*

To avoid the possibility that the $CSSD_t$ measure is sensitive to outliers since it is measured as squared return-deviations, Chang et al. (2000) proposed an alternative model by incorporating the absolute value of the deviations and define Cross-sectional Absolute Deviation (CSAD) as a measure of return dispersion, described by the following specification:

$$CSAD_t = \frac{1}{N}\sum_{i=1}^{N}\left|r_{i,t} - r_{m,t}\right| \quad (3)$$

Chang et al. (2000) built their model on the theoretical intuition that the linear relationship between CSAD and market returns, as suggested by asset pricing models (CAPM), may not necessarily hold during periods of

[2] Christie and Huang have used 1 (5) percent of observations in lower (upper) tail of the return distributions to define extreme up (down) market

market stress if investors tend to herd during extreme market movements. Instead, the relationship can become non-linear. Chang et al. models this non-linear relationship by the following equation:

$$CSAD_t = \propto + \gamma_1 |r_{m,t}| + \gamma_2 r_{m,t}^2 + \varepsilon_t \quad (4)$$

where $r_{m,t}$ is the realized return on an equally-weighted portfolio of all stocks on day t and $|r_{m,t}|$ is the absolute term. If investors herd during periods of large price movements we would expect a negative and statistically significant non-linear coefficient ($\gamma_2$) that implies that the dispersion between individual returns and market returns will decline non-linearly during large market movements. Alternatively, a statistically significant positive $\gamma_2$ would indicate that there would be no evidence of herding during market stress.

To be more specific and comprehensive in our analysis, and allow for the possibility of an asymmetric relationship of herd behavior for up-market in comparison to the days when the market was down, we ran the following two additional equations of Chang et al. (2000) model:

$$CSAD_t^{UP} = \propto + \gamma_1^{UP} |r_{m,t}^{UP}| + \gamma_2^{UP} \left(r_{m,t}^{UP}\right)^2 + \varepsilon_t \quad (5)$$

$$CSAD_t^{DOWN} = \propto + \gamma_1^{DOWN} |r_{m,t}^{DOWN}| + \gamma_2^{DOWN} \left(r_{m,t}^{DOWN}\right)^2 + \varepsilon_t \quad (6)$$

where $r_{m,t}$ represents returns on an equally-weighted market portfolio and $|r_{m,t}^{UP}| \left(|r_{m,t}^{DOWN}|\right)$ is the up (down) realized market returns on the equally-weighted portfolio on day *t*. The up (down) market returns are defined as positive (negative) returns on a day t (Chang et al., 2000).

### *3.2. Herding and Thin Trading*

One of the features of emerging markets is the infrequent (thin) and non-synchronous trading that occurs when infrequently traded stocks have long sequences of zero returns which can induce false autocorrelations in the returns series. This can introduce bias in empirical estimations, particularly in relation to market efficiency estimates, as shown by studies of Lo and Mackinlay (1990), Miller et al. (1994), and Antoniou et al. (1997). Kallinterakis and Kratunova (2007) showed that thin trading could underestimate the intensity of herd behavior in a thinly traded market. Utilizing top capitalization stocks data from the Bulgarian market SFIX index, the authors found insignificant herding estimations prior to thin trading adjustments to the data, whereas post-adjustments

showed increasing signs of significant herd formations. The authors attributed this to the illiquidity of the market and suggested illiquidity as an obstacle to herding by market participants. Kallinterakis (2009) studied the Vietnam market and also suggests thin trading to have a positive bias over herding. In such a case, we could expect thin trading to have an effect on herding estimations in a developing market like Pakistan.

To account for thin trading, we employed the methodology of Miller et al. (1994) which shows that returns can be adjusted for thin trading through an adjusted returns (AR) (1) process:

$$R_t = \propto_1 + \propto_2 R_{t-1} + \varepsilon_t \tag{7}$$

Adjusted returns are then obtained as:

$$R_t^{adj} = \frac{\varepsilon_t}{(1-\varepsilon_t)} \tag{8}$$

A problem with equation (8) is that it assumes adjustments to be time-invariant, which may not hold true for emerging markets where windows of trading inertia often exist (Kallinterakis, 2009). As an alternative, Antonio et al. (1997) suggested a recursive estimation of the equation (8) which we also adopted in this study given the very possibility of thin trading in Pakistan's market.

### *3.3. Data*

We used daily stock price data and year-end market capitalization returns data for 284 firms traded on the Pakistan Stock Exchange from 1 January 2002 to 31 December 2010 to examine herding in Pakistan's market. The daily stock prices and market capitalization data for these firms were collected from an online database maintained by Business Recorder, a premier daily business newspaper in Pakistan. The sample time period covers various extreme up and down market movements, including the March 2005 crisis and bear market period of 2008, as well as the bull market period from 2002 to early 2005.

Prior studies on herd behavior in financial markets are based on a rationale that a group is more likely to be involved in herd behavior if it is sufficiently homogenous. Consequently, empirical studies (Christie and Huang, 1995; Henker, Henker and Mitsios, 2006; Demirer et al., 2007; Chiang and Zheng, 2010) have conducted herding tests on groups (or sectors) of stocks. In line with previous studies, we assigned 284 stocks to 18 sectorial

groups in our sample. An equally-weighted portfolio return for each sector was then calculated for all stocks in that sector. We use Karachi Stock Exchange (KSE) 100 Index to proxy for market returns. KSE-100 Index is a value-weighted index of 100 companies selected from all sectors of the economy based on the market capitalization. It represents more than 80 percent of the market capitalization and is a fair representation of the market.

### *3.4. Empirical Results*

Summary descriptive statistics for mean daily log returns (Panel A) and Cross-Sectional Standard Deviation (CSSD)[3] for various sectors are reported in Table 1. As panel A of the table shows that average returns for all except three sectors (power generation and distribution, synthetic and rayon, and banks) are positive, while power generation and distribution, and synthetic and rayon have highest daily mean returns volatility. Panel B reports univariate statistics for the measure of cross-sectional return dispersion (CSSD) for each sector. The table shows that technology and communications has the highest CSSD, followed by synthetic and rayon, while the fertilizer sector displays the lowest level of dispersion. Comparing maximum and minimum values of the daily CSSD indicates that the technology and communications sector has the highest value, while the fertilizer sector has the lowest maximum value. A number of sectors have a minimum value of zero for CSSD suggesting that on those days there was no trading in any of the stocks in a particular sector. Table 1 also reports autocorrelation values at different lags for the CSSD series. It is evident from the table that the time series of CSSD for all sectors appears to have high autocorrelations. The first-order autocorrelation has a maximum value of 0.339 for technology and communications and lowest value of 0.130 for Vanaspati and Allied. Hence, we adjusted standard errors of the estimated regression coefficients for autocorrelations and heteroscedasticity by employing an approach attributed to Newey and West (1987). Further, it is evident from the table that CSSD for all sectors exhibits significant positive skew and kurtosis. Dickey and Fuller (1979) test indicated that the series is stationary for all sectors.

[3] We also calculated descriptive summary statistics for CSAD. The mean and standard deviation values for majority of the sectors were higher than that of CSSD

**Table 1. Descriptive Statistics Panel A: Average Daily Rates of Returns**

| Sector | Mean | Std. Dev. |
|---|---|---|
| Chemicals | 0.0486 | 1.5449 |
| Engineering | 0.0803 | 1.4726 |
| Glass and Ceramics | 0.0085 | 1.8822 |
| Paper and Board | 0.0114 | 1.5324 |
| Pharmaceuticals | 0.0532 | 1.0949 |
| Power Generation and Distribution | -0.0047 | 2.3557 |
| Refinery | 0.0016 | 2.1425 |
| Sugar and Allied Industries | 0.0439 | 1.6492 |
| Synthetic and Rayon | -0.0487 | 3.1384 |
| Technology and Communication | -0.0130 | 2.1803 |
| Vanaspati and Allied Industries | 0.0642 | 1.9047 |
| Woolen | 0.1148 | 1.7179 |
| Cement | 0.0136 | 2.1863 |
| Fertilizer | 0.0327 | 1.7047 |
| Oil and Gas Exploration Companies | 0.0478 | 2.1142 |
| Oil and Gas Marketing | 0.0172 | 1.7596 |
| Commercial Banks | -0.0189 | 1.9060 |
| Automobiles Assembler | 0.0104 | 1.5825 |

This panel provides mean and standard deviation of daily stock returns for 18 sectors.

## Table 1 Panel B: Descriptive Statistics for Cross-Sectional Standard Deviation (CSSD)

| | Mean | Maxi. | Mini. | Std. Dev. | Sk. | Kurt. | J-Bera | # of Obs. | # of firms | Serial Correlations for different lags | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 20 | DF test |
| Banks | 0.01684* | 0.18363 | 0.00026 | 0.01085 | 5.96 | 70.65 | 2904.16* | 1968 | 26 | 0.234 | 0.208 | 0.174 | 0.12 | 0.124 | 0.134 | -10.488* |
| Cement | 0.01794* | 0.16914 | 0.00177 | 0.00939 | 4.33 | 57.56 | 1289.68* | 1968 | 24 | 0.315 | 0.258 | 0.214 | 0.252 | 0.232 | 0.153 | -10.714* |
| Chemicals | 0.02196* | 0.27252 | 0.00000 | 0.01208 | 7.52 | 145.67 | 8629.11* | 1968 | 27 | 0.166 | 0.134 | 0.117 | 0.054 | 0.086 | 0.035 | -12.20* |
| Engineering | 0.02340* | 0.13988 | 0.00000 | 0.01204 | 1.93 | 12.36 | 9648.11* | 1968 | 17 | 0.176 | 0.084 | 0.075 | 0.013 | -0.02 | 0.049 | -14.93* |
| Fertilizer | 0.01108* | 0.06200 | 0.00000 | 0.00725 | 1.69 | 8.80 | 3399.67* | 1968 | 5 | 0.186 | 0.094 | 0.062 | 0.045 | 0.062 | -0.001 | -13.206* |
| Glass and Ceramics | 0.02289* | 0.15602 | 0.00000 | 0.01542 | 2.60 | 15.88 | 4808.54* | 1968 | 14 | 0.298 | 0.193 | 0.165 | 0.116 | 0.093 | 0.059 | -12.78* |
| Oil and Gas Exploration | 0.01216* | 0.15863 | 0.00000 | 0.01019 | 3.86 | 47.58 | 18555.8* | 1968 | 6 | 0.132 | 0.08 | 0.107 | 0.108 | 0.140 | 0.093 | -9.7765* |
| Oil and Gas Marketing | 0.01220* | 0.09160 | 0.00000 | 0.00810 | 2.23 | 16.76 | 2405.62* | 1968 | 7 | 0.183 | 0.138 | 0.150 | 0.104 | 0.061 | 0.047 | -12.488* |
| Paper and Board | 0.01493* | 0.12552 | 0.00000 | 0.01520 | 3.09 | 16.04 | 1188.58* | 1968 | 13 | 0.217 | 0.133 | 0.090 | 0.024 | 0.033 | 0.012 | -13.99* |
| Pharmaceuticals | 0.01537* | 0.08398 | 0.00000 | 0.00775 | 2.13 | 14.73 | 2006.23* | 1968 | 9 | 0.201 | 0.165 | 0.169 | 0.152 | 0.142 | 0.110 | -11.699* |
| Power Generation and Distribution | 0.02227* | 0.18105 | 0.00000 | 0.01184 | 2.94 | 29.73 | 8977.39* | 1968 | 15 | 0.282 | 0.213 | 0.181 | 0.147 | 0.110 | 0.099 | -13.463* |
| Refinery | 0.01406* | 0.10066 | 0.00000 | 0.01031 | 2.35 | 15.09 | 8879.59* | 1968 | 5 | 0.150 | 0.093 | 0.085 | 0.077 | 0.123 | 0.004 | -11.608* |
| Sugar and Allied | 0.02498* | 0.07608 | 0.00268 | 0.01036 | 0.96 | 4.52 | 1127.14* | 1968 | 46 | 0.325 | 0.24 | 0.223 | 0.216 | 0.166 | 0.093 | -11.154* |
| Synthetic and Rayon | 0.02636* | 0.18396 | 0.00000 | 0.02102 | 1.77 | 9.02 | 3506.60* | 1968 | 22 | 0.176 | 0.091 | 0.090 | 0.083 | 0.065 | 0.029 | -13.395* |
| Technology and Communications | 0.05546* | 1.52926 | 0.00000 | 0.07187 | 7.85 | 141.31 | 4247.86* | 1968 | 13 | 0.339 | 0.257 | 0.205 | 0.213 | 0.155 | 0.091 | -13.407* |
| Vanspati and Allied | 0.02113* | 0.21034 | 0.00000 | 0.01633 | 2.26 | 19.53 | 1866.84* | 1968 | 13 | 0.130 | 0.128 | 0.068 | 0.100 | 0.063 | 0.046 | -13.255* |
| Woolen | 0.01312* | 0.25564 | 0.00000 | 0.09789 | 3.07 | 30.48 | 2418.99* | 1968 | 7 | 0.220 | 0.11 | 0.060 | 0.050 | 0.040 | 0.030 | -11.107* |
| Auto Assembler | 0.02163* | 0.17939 | 0.00109 | 0.01146 | 5.33 | 60.65 | 1858.76* | 1968 | 15 | 0.220 | 0.12 | 0.100 | 0.100 | 0.120 | 0.060 | -12.199* |

NOTE: * (**) indicates significance at 1% (5%) level. Sk,Kurt and DF stand for skewness, kurtosis and Dickey Fuller, respectively.

### *3.4.1. Evidence of Herd Behavior: Returns Dispersion Model*

Results of the dispersion model (equation 2) are reported in Table 2. We used daily returns of KSE-100 Index as a proxy for market returns and used the upper and lower 5 percentiles of the index returns as periods of large price movements, termed as market stress. As shown by Table 2, positive and significant dummy variable coefficients indicate that we did not find any evidence of herd behavior in any of the sectors, during large price movements. Positive dummy coefficients ($B^L$and $B^D$) also imply that equity return dispersions tend to increase during periods of large price movements in the market. These findings are not consistent with our definition of herding in which case we would have observed a decrease in equity dispersion levels.

**Table 2: Regression analysis Cross-Sectional Standard Deviation (CSSD)**

| Industry | $\alpha$ | $\gamma^U$ | $\gamma^L$ | Adj.R² | F-test |
|---|---|---|---|---|---|
| Cement | 0.0179* | 0.0229* | 0.1603* | 0.029 | 7.36* |
| Fertilizer | 0.0115* | 0.0011* | 0.0187* | 0.048 | 20.59* |
| Oil and Gas Exploration | 0.0111* | 0.1016* | -0.0078** | 0.039 | 9.86* |
| Oil and Gas Marketing | 0.0117* | 0.0010* | 0.0251* | 0.044 | 20.67* |
| Commercial Banks | 0.0192* | 0.0005 | 0.0897* | 0.054 | 25.87* |
| Automobiles Assembler | 0.0167* | 0.0135* | 0.0379* | 0.050 | 20.65* |
| Engineering | 0.0281* | 0.0073* | 0.0006 | 0.028 | 12.89* |
| Glass and Ceramics | 0.0216* | 0.0063 | 0.0022 | 0.080 | 51.34* |
| Paper and Board | 0.0215* | 0.0027 | -0.0029* | 0.038 | 17.83* |
| Pharmaceuticals | 0.0173* | 0.0003 | 0.0013* | 0.029 | 13.89* |
| Refinery | 0.0144* | 0.0042* | -0.0004 | 0.048 | 22.83* |
| Sugar and Allied | 0.0279* | 0.0011 | -0.0008 | 0.078 | 37.22* |
| Synthetic and Rayon | 0.0351* | 0.0133* | 0.0024 | 0.042 | 19.96* |
| Technology and Communication | 0.0216* | 0.0039 | -0.0002 | 0.028 | 8.49* |
| Vanaspati and Allied Industries | 0.0239* | 0.0008 | -0.0006 | 0.027 | 7.59* |
| Woolen | 1.1066* | -0.3905 | -0.0610 | 0.032 | 6.89* |
| Chemicals | 0.0279* | 0.0095* | 0.0009 | 0.019 | 5.59* |
| Power Generation and Distribution | 0.0388 | 0.0156 | 0.1827 | 0.001 | 1.78 |

This table provides results for the Christie and Huang model (equation 2) to detect herd behavior at the market and industry level. Separate regressions were done for each of the 18 sectors. $\gamma^U$ ($\gamma^L$) is a coefficient for dummy variable that is equal to one if the market returns on a day $t$ fall in the extreme lower (upper) boundary of the returns distributions. * (**) represent significance at the 1(5) percent level, respectively.

Table 3 reports results for the Chang et al. (2000) model of equations: (4), (5), and (6). We followed the standard procedure of the model by running three separate regressions for each sector, one using data from the entire sample and one regression each for the periods of up and down

market movements[4]. This procedure allowed us to account for any significant non-linear asymmetric effects in the herd behavior. First, we examined coefficient results of the model for the entire sample period. The mean value of the equity dispersions, as measured by the regression coefficient $\propto$, has the highest value for the technology and communication sector and the lowest value for the fertilizer sector. Furthermore, the table shows that $\gamma_1$ coefficient for all sectors for the linear term$|R_{mt}|$ are positive and statistically different from zero[5] for the model (entire sample). These results imply that CSAD tends to increase with $|R_{mt}|$. Next, we considered the linear term coefficient ($\gamma_1$) for the two sub-periods. $\gamma_1$ for periods of up and down market movements are also positive and statistically significant for the majority of the sectors. This implies that equity return dispersions also tend to increase with market movements irrespective of the direction of the market. We cannot, however, differentiate as a whole, whether the increase in equity dispersion is higher (on the basis of the values of $\gamma_1$) for either up or down market movements as, for some sectors, this increase is higher for up market movements, but for other sectors this increase is higher for down market movements. In other words, it does not suggest that the dispersions are, on average, wider for up or down market movements.

[4]Up (Down) market is defined as one when the index returns are positive (negative) on a day t.
[5]Coefficients for three sectors are negative but not statistically significant.

## Table 3 Regression for Cross-sectional Absolute Deviation (CSAD)

| | Entire Sample | | | Up Market | | | Down Market | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sector** | $\alpha$ | $\gamma_1$ | $\gamma_2$ | $\alpha$ | $\gamma_1^{UP}$ | $\gamma_2^{UP}$ | $\alpha$ | $\gamma_1^{DOWN}$ | $\gamma_2^{DOWN}$ |
| Commercial Banks | 0.012* | 0.146* | -1.164 | 0.008* | 0.259* | -4.348* | 0.013* | -0.023 | 3.044 |
| Cement | 0.009* | 0.125* | -0.223 | 0.009* | 0.111* | -1.055 | 0.012* | 0.141 | 0.852 |
| Chemicals | 0.018* | 0.131* | 1.672 | 0.018* | 0.074 | 2.926 | 0.016* | 0.191** | 0.588 |
| Engineering | 0.018* | -0.016 | 2.876** | 0.019* | -0.035 | 3.587* | 0.018* | 0.054 | 0.901 |
| Fertilizer | 0.008* | 0.091** | -0.357 | 0.009* | 0.065 | -0.248 | 0.008* | 0.102 | 0.495 |
| Glass and Ceramics | 0.015* | 0.149 | 0.002 | 0.016* | 0.085 | -0.123 | 0.014* | 0.224 | -0.028 |
| Oil and Gas Exploration | 0.009* | 0.297* | -7.854* | 0.008* | 0.320* | -8.129* | 0.011* | 0.238 | -7.004 |
| Oil and Gas Marketing | 0.008* | 0.304* | -5.801* | 0.009* | 0.309* | -5.485* | 0.006* | 0.321* | -6.647** |
| Paper and Board | 0.012* | -0.091 | 2.593 | 0.012* | 0.076 | 0.810 | 0.013* | -0.318* | 6.478* |
| Pharmaceuticals | 0.011* | 0.138* | -0.476 | 0.009* | 0.162* | -1.934* | 0.009* | 0.053 | 2.108 |
| Power Generation and Distribution | 0.015* | 0.208* | 1.322 | 0.016* | 0.085 | 2.963 | 0.013* | 0.342* | 0.489 |
| Refinery | 0.012* | 0.095 | -2.491* | 0.011* | 0.125 | -1.719 | 0.013* | 0.067 | -2.830 |
| Sugar and Allied Industries | 0.016* | 0.064 | 1.099 | 0.013* | 0.007 | 0.563 | 0.018* | 0.094 | 2.430 |
| Synthetic and Rayon | 0.019* | 0.121 | 2.975 | 0.019* | 0.097 | 2.993 | 0.021* | 0.064 | 5.691 |
| Technology and Communication | 0.027* | 0.164 | 10.086 | 0.023* | 0.391 | -4.490 | 0.040* | -0.329 | 27.665 |
| Vanaspati and Allied | 0.018* | -0.019 | 1.583 | 0.017* | -0.057 | 2.044 | 0.021* | 0.083 | 0.483 |
| Automobiles Assembler | 0.013* | 0.055 | 1.404 | 0.019* | 0.025 | 2.333 | 0.013* | 0.128 | 0.056 |

Christie et al. (2000) model of equations (4), (5) and (6). $\gamma_1$ is a coefficient representing realized stock returns on an equally-weighted portfolio of all stocks on day t while $\gamma_2$ is a coefficient for the non-linear term of the realized stock returns on an equally-weighted portfolio of all stocks on day t. $\gamma_1^{UP}$ represents returns on an equally-weighted market portfolio during up-market period while $\gamma_2^{UP}$ is the coefficient of the non-linear term of the same equally-weighted market portfolio. $\gamma_1^{DOWN}$ is the coefficient for the equally-weighted market portfolio during the down-market period while $\gamma_2^{DOWN}$ is the coefficient for the non-linear term of the equally-weighted market portfolio during the down-market period. Up- and down-market periods represent positive and negative market returns. Separate regressions were run for each of the 18 sectors. $\propto$ is a constant term. *(**) represents statistical significance at 1(5) percent level, respectively.

We then examined results for the non-linear coefficient ($\gamma^2$). This coefficient is not statistically significant for all except three sectors for the two sample intervals, namely the entire sample data and the up market period. This statistically insignificant $\gamma^2$ supports predictions of the rational asset pricing models and is consistent with the results of Table 2, that is, a positive linear relationship of CSAD with market returns and the absence of herd formations in the majority of the sectors. These results imply that as the average market returns increase, the CSAD in the two sectors increases at a decreasing rate—a sign of the absence of herd formation. The negative $\gamma^2$ also implies that CSAD increases at a decreasing rate as investors suppress private information in favor of the sector consensus. The only exceptions to these results are the three sectors of oil and gas marketing, oil and gas exploration, and pharmaceuticals, for which γ^2 for the entire sample as well as up market periods are negative and statistically significant. A positive and linear relationship between equity dispersion and market returns does not hold for these sectors. Several plausible explanations could be offered for the occurrence of herding formations in these two inter-related sectors. First, most of the stocks in the oil and gas exploration sector are considered as cash-rich stocks. Trading activity in such stocks tends to be higher than the other stocks. This may cause the prices of these shares to move in tandem with the market movements. Additionally, foreign investors are mainly concentrated in this sector and hold a large portion of their investment portfolio in the sector[6]. Several studies find that foreign institutional investors engage more in herding and feedback trading than the domestic individual investors (Wermers, 1999; and Shyu and Sun, 2010). Foreign portfolio investment flows have the potential to destabilize the market in the host country because they are short-term flows (Tayde and Roa, 2011). This might result in the presence of herd formation in these two sectors.

When we examined regressions run separately for up and down market returns, we did not find any difference in the patterns of equity return dispersions for the two market movements. Similar to the data for the entire sample, evidence of herd formation is not found for any of the sectors, except for two during up market movements, and for only one sector during down market movements.

As a robustness check, we also accounted for the phenomenon of thin trading by employing recursive estimation of equation (8). Results, not

[6] Bava (2012) estimates that almost 50% of the portfolio of foreign investors are concentrated in oil and gas sector

reported here, remain qualitatively similar to those reported in Table 3. Overall, empirical results tend to support the notion of no herd formation in Pakistan's market. These results are not in line with many of the findings for developing markets, where although the evidence is mixed with some studies finding the presence of herd behavior in many developing markets, some studies find no such evidence in other markets. However, the balance of the evidence tilts towards herd formations in developing markets as compared to industrialized markets. Several explanations may be offered for the results for Pakistan's market. First, being a developing market, Pakistan's is characterized by thin trading and low turnover. Many of the stocks in various sectors are not actively traded. Second, Pakistan's market is mainly dominated by small investors with little presence of institutional investors.

## 4. Conclusion

There is a growing body of literature in behavioral finance on the study of herd behavior in financial markets, particularly in emerging markets. In this paper, we extended models of herd behavior to an emerging market by employing firm-level data for 18 sectors in Pakistan's market. Two models of herding were used in the study. The linear model of Christie and Huang (1995) finds no evidence of herd formation, in any of the sectors, during periods of large market movements. Similarly, non-linear model of Chang et al. (2000) also finds no evidence for herd behavior for all but two sectors for the whole sample and for sub-samples upward and downward market movements. Overall, results predominantly support the view that there is little herd formation in Pakistan's market. Further, the phenomenon of thin trading is typical of many markets and incorporating such market frictions in future studies can help generalize the results and arrive at conclusions that are more robust.

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# Determinants of Credit Infections: Evidence from Banking Sector in an Emerging Economy

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**Abstract**

*This paper applies dynamic panel estimates on 22 commercial banks in Pakistan to determine the factors that affect their asset quality. Consequently, the study tests for a comprehensive array of both bank-specific and macroeconomic variables collected quarterly from 2008 to 2016. The empirical analysis confirms that bad asset quality can be explained by retarded GDP growth and unfavorable movement in exchange and lending rates. Within the bank-specific variables, non-performing loans are the most responsive to loans to the agriculture and energy sectors, level of capitalization, size of the lending institution and quality of management.*

**Keywords***:* Asset quality, banking risks, non performing loans, credit risk

**JEL Classifications:** G20, G21, G29.

## 1. Introduction

Banks face many risks that, if materialized, could lead to financial distress and systematic failure. One such risk is the credit risk. By definition credit risk derives from the expectation that some of the firm's assets will decline in value and perhaps become worthless. As of December 2016, the operations of 34 commercial banks in Pakistan had extended total advances of Rs 5403.2 billion, equivalent to 15.6% of the GDP of the country (Statistical Supplement, State Bank of Pakistan, 2016-17). The importance of the banking system in Pakistan is furthered by the absence of a developed and efficient capital market. Its role in the allocation of funds in the economy cannot be overemphasized, and it is imperative that the banking system remains stable and solvent.

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To mitigate the risk, banks follow strict credit risk management policies under exhaustive guidelines specified within the Prudential Regulations of the State Bank of Pakistan[4]. Despite these stringent regulations, there is a continued occurrence of non-performing loans (NPLs), as measured in terms of asset quality in the bank's portfolio.

In December 2016 the total NPLs of banks in Pakistan were valued at Rs. 631 billion, about 62% of which were of private commercial banks (Statistical Supplement, State Bank of Pakistan, 2016-17). The presence of these bad loans leads to decreased profit margins for individual banks, and increased solvency risk of the entire banking system. A failure of the banking system would have unprecedented effects in the real economy, which would lead to long-term economic distress. This is evidenced by Nkusu (2011) who found that NPLs link credit markets to macro-economic performance for 26 developed countries in the period 1998-2009.

The determinants of NPLs have been explored quite extensively for banking systems around the world. Polodoo et al. (2015) conducted a study on the ten banks in Mauritius from 2000-2012 to determine the main factors impacting NPLs. They used both bank-specific and macroeconomic determinants for analysis. Findings indicated that critical variables were sector-wise credit concentration and cross-border lending. In Pakistan, there is also evidence of sector-wise concentration. The largest amount of credit extended by commercial banks is to the manufacturing sector, amounting to Rs 1644.5 billion, constituting about 39% of total lending to private sector enterprises (Statistical Supplement, State Bank of Pakistan, 2016-17). The Energy Sector and Commerce and Trade follow with 6% and 5.3% respectively.

Louzis et al. (2011) found the bank-specific and macroeconomic determinants of NPLs among nine Greek commercial banks for the period of 2003-2009, separating the loans into consumer, business, and mortgage loan categories. . The variation in NPLs in their sample is largely explained by the external factors of GDP, unemployment, interest rate, and public debt and the internal factor of management quality. They also found that the impact of these external factors varies among the loan categories, with mortgage loans showing the least response.

Macit (2017) investigated the determinants of the NPL ratio for Turkey using quarterly data from 15 of the country's largest commercial banks. The data ranging from 2005 to 2010 show that well-capitalized banks tend to have a higher ratio, similar to banks with a greater interest margin. The paper argues that banks which are better able to diversify are

able to reduce their NPL ratio. The study also showed that GDP growth and foreign exchange rates also impact the performance of loans in Turkey.

Literature on the subject is further enhanced by Abid et al. (2014) who also found that management quality and macroeconomic factors are the major determinants of non-performing loans in Tunisian commercial banks. Their results are taken from a sample of 16 Tunisian banks from2003-2012. Akinlo and Emmanuel (2014) in Nigeria and Khemraj and Pasha (2009) in Guyana also found macroeconomic variables of GDP, exchange rate, and interest rate to be the most important factors determining the level of NPLs. The same results were confirmed for Italian commercial banks by Bofondi and Ropele (2011).

Moreover, using bank-specific as well as country-specific variables, Dimitrios et al. (2016) examined the determinants of NPLs in 15 European countries over 25 years from 1990-2015. Their findings conclude that Return on Equity (ROE) affects the NPLs in the same time period, as well as with a lag. Similarly, Return on Assets (ROA), economic growth, the output gap, and tax income affect NPLs significantly; emphasizing that macroeconomic condition can significantly affect the performance of banks.

Zaib et al (2014) attempt to explain the determinants of NPLs for Pakistani banks from 2003-2011. They drew from panel data of eight banks using bank-specific factors: bank size, risk profile, and management; and macroeconomic variables: GDP growth, exchange rate, lending rate, inflation, and unemployment. They found that GDP growth, risk profile, and management significantly explained the NPLs within the banking system.

Beck et al. (2013) emphasize the role of efficient capital markets and nominal exchange rates as significant variables in explaining variation in NPLs across 75 countries; GDP growth, share prices, and bank lending rate were also important variables. The results of De Bock and Demyanets (2012) had similar findings for 25 developing economies from 1996-2010. In addition to the variables identified by Beck et al. (2013), De Bock and Demyanets (2012) found that terms-of-trade also affects the level of NPLs. In the absence of a developed and efficient capital market, banks in Pakistan cater to more than 99% of all corporate financing needs as shown in Table 1. This further enhances the significance of a solvent banking system as any adverse shocks to bank stability will have a devastating impact on the real economy.

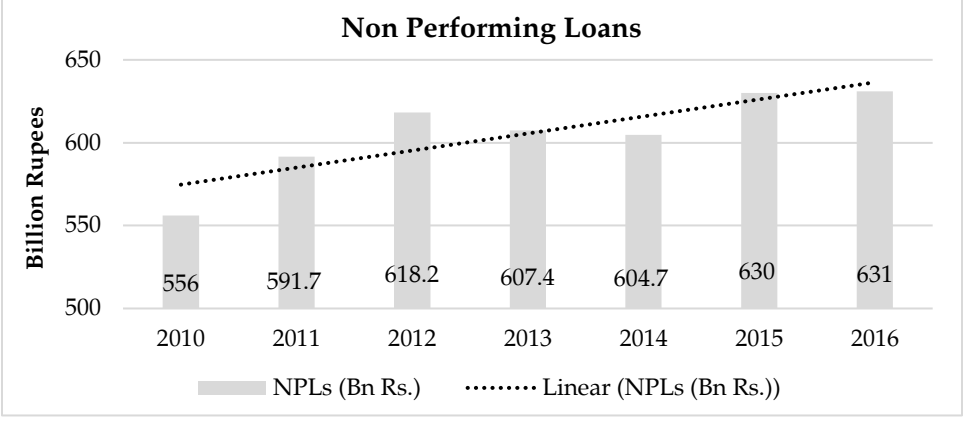
**Table 1: Role of Financial Intermediaries vs Capital Markets**

| Years | Funds raised ipos/spos (bn Rs) | Tfc (bn Rs) | Bank (bn Rs) | Total | Percentage |
|---|---|---|---|---|---|
| 2011 | 8.10 | 4.00 | 2364.50 | 2376.60 | 99.49 |
| 2012 | 10.31 | 6.30 | 2393.10 | 2409.71 | 99.31 |
| 2013 | 7.60 | 6.00 | 2414.00 | 2427.60 | 99.44 |
| 2014 | 14.89 | 7.80 | 2695.50 | 2718.19 | 99.17 |
| 2015 | 11.28 | 0.00 | 2859.50 | 2870.78 | 99.61 |
| 2016 | 8.13 | 3.00 | 2933.04 | 2949.63 | 99.44 |

***Source:*** SECP and SBP annual reports 2016

The link can be explained by the failure of the banking system to act as a conduit to transfer resources from surplus units to deficit units. At best, a rise in the issuance of bad loans leads to a reduction in the supply of credit, and in the extreme, bank failure and a system-wide contagion impeding efficient resource allocation and economic growth. Figure 1 shows that the credit infection for banks in Pakistan in absolute rupee terms has been trending largely upward since 2010.

**Figure 1: Non-Performing Loans in PKR**




Source: SBP Annual Reports

It is imperative for banking system regulators and policy planners to know what factors give rise to NPLs in Pakistan. This should allow for the adoption of effective regulatory mechanisms to reduce the occurrence of NPLs and ensure continued solvency of the system.

This study adds to the existing literature by selecting a very comprehensive list of independent variables representing both systematic

and idiosyncratic determinants of bank risk. Moreover, this paper undertakes the research within the time-frame of the post-financial reform to ensure that all changes have been well-implemented and their impact can be effectively studied for all private commercial banks operating within Pakistan. It provides results that can be used for efficient policy-making and impact-analysis by the regulatory authority.

## 2. Research Methodology

This section focuses on the research methodology which includes variables, data and econometric models.

### *2.1. Data and Econometric Model*

The bank-specific data required for this study have been gathered from quarterly financial statements of commercial banks operating in Pakistan for the period of 2008-2016. Our sample does not include any public sector-owned banks as their inherent contractual guarantees provide them less incentive to diversify risk. Banks that have been delisted or merged were also excluded from the analysis. Based on this criteria we have a balanced panel of 22 commercial banks. The macroeconomic data have been gathered from various issues of the Pakistan Economic Survey, State Bank of Pakistan Statistics, and World Development Indicators.

### *2.2. Variables*

#### *2.2.1. Dependent Variable*

Prudential regulations of the State Bank of Pakistan define NPLs and their required financial statement treatment[5]. These regulations are taken into consideration for the purpose of this analysis as they deal exclusively with the lending departments of banks, focusing primarily on larger loans. Theoretically, as discussed in the literature above, the probability of default on such loans is fairly high. According to the literature, asset quality of a bank is measured by the ratio of NPLs to total loans.

#### *2.2.2. Independent Variables*

The paper aims to analyze the determinants of NPLs affecting the asset quality of banks in Pakistan. For this purpose both bank specific and macroeconomic variables are utilized.

### *2.2.3. Bank-Specific Variables*

#### 2.2.3.1. Return on Equity

Return on Equity (ROE) is a measure of the bank's profitability derived from shareholders equity. It is a good measure for evaluating the bank's management performance. According to Salas (2002), bank-specific variables like ROE can be indicative of a possible rise in NPLs in the future. In order to test this, the lagged values of ROE will be used for evaluating how a bank's past management performance can have an impact on the current NPLs. Lagged value of ROE will be used as a proxy for a bank's past management quality. As the paper uses a yearly panel to analyze the determinants of NPLs, one year lag of bank-specific variable will be taken to analyze how past performance affects NPLs. According to a study by Louizs (2012), there is a negative relationship between management performance and NPL. Similarly, past performance, measured by using lags of ROE, has a negative relationship with current NPLs. Abid (2014) found that past management performance is negatively related to the current NPLs.

#### 2.2.3.2. Capital Adequacy Ratio

Capital Adequacy Ratio (CAR) is a measure of a bank's eligible capital compared to its risk-weighted assets. This ratio is important for analyzing the bank's capacity to cope with the risk of losses that may arise. The CAR for all banks has been taken from their financial statements.

A lower value of CAR suggests a low capitalization level for a bank, which may result in high levels of NPLs. Moral hazard action by the manager may cause a bank to take excessive risk by lending out to risky borrowers, leading to increases in the volume of NPLs. As mentioned above, CAR is a bank-specific variable. Its lag will be considered in order to evaluate how a bank's previous year's risk measure impacts the current NPL ratio.

#### 2.2.3.3. Size (lnTA)

A larger bank is expected to have a lower credit risk compared to smaller banks. This could be attributed to opportunity for diversification and the resultant quality of credit portfolio. Larger banks have more opportunity to avoid concentration in advances, thereby reducing loan

losses. Hu et al. (2004) assert that larger banks incur economies of scale when analyzing borrower data for both pre- and post-disbursement of the loan. Therefore, the NPLs of larger banks are expected to be lower. Similarly, Abid (2014) expect the relationship between bank size and NPLs to be negative.

However, other studies find a positive association between bank size and NPLs. Polodoo et al. (2015) and Rajan and Dhal (2003) suggest an increase in bad loans as the size of the bank increases due to complexity and the volume of their advances. This hypothesis suggests that large banks tend to be more lenient in extending credit and taking on more risk in their portfolio. This gives rise to the Too Big To Fail (TBTF) situation as discussed by Louzis (2012). In this case, the imposition of market discipline by related stakeholders becomes weak, and banks tend to indulge in the moral hazard of lending to less-than-optimal borrowers.

Based on the literature, this paper expects to find either of these two associations of bank size with NPL ratio.

2.2.3.4. Lagged Total Loans

Bad loans are expected to occur in subsequent years of their dispersion. This is because of the prevalent uncertainty in the economic and political environment, which could adversely affect performance of businesses and force them to default on their obligations. This view is supported by Polodoo et al (2015) who find this to be a significant variable in explaining the occurrence of NPLs. This study expects a positive relationship between the NPLs and lagged total loans.

2.2.3.5. Sectoral Concentration

Banks tend to lend the most to the high-earning sectors of the economy to ensure better returns on their credit portfolios, as explained by Afzal and Mirza (2012). This could lead to concentration in the loan portfolio and could expose banks to high risk in case of an adverse movement in the performance of that sector. Keeton and Morris (1987) find a significant impact of credit concentration on NPLs.

This study takes sectoral advances to Textile, Energy, and Agriculture sectors by sample banks, similar to a previous study by Afzal and Mirza (2012) These sectors receive the most credit from the banking system and are also most prone to effects from prices and supply of

electricity, POL, and water; their financial position may vary greatly over the life of the loan. A positive relationship is expected between concentration of credit to each of these sectors and the occurrence of NPLs.

2.2.3.6. Leverage Ratio: Total liabilities/ Total Assets

Banks are expected to take higher risks by soliciting more funds and extending excessive credit to increase their returns. This is more likely to hold for banks with a larger asset base and a wider outreach than smaller banks. However, smaller banks would have the incentive to take excessive risks by increasing their leverage ratio in order to increase their income. This paper expects a positive relationship between leverage ratio and asset quality.

2.2.3.7. Indebtedness: Total Loans to Private Sector/GDP

In times of economic growth banks tend to lend heavily to the expanding private sector as discussed by Nkusu (2011). They may relax their risk management practices to earn higher returns. However, an adverse economic shock may lead the private sector firms into debt repayment issues, thereby causing financial distress to the banking sector. We expect a positive relation between indebtedness and NPL ratio.

*2.2.4. Macroeconomic Variables*

2.2.4.1. GDP Growth

The relationship between the phases of the business cycle and credit defaults has been confirmed in the literature many times. As incomes fall, borrowers are unable to meet their debt obligations and the NPLs of the banking system rise (Quagliariello 2007; Salas and Saurina 2002). This study expects a negative effect of GDP growth on the bad debts of banks.

2.2.4.2. Inflation

According to the literature, there appears to be a significant and positive relationship between rate of inflation and NPLs. Whenever the economy experiences low levels of inflation, there will be less volatile inflation, so there is less probability of the unexpected which decreases the probability of falling into arrears. Over the long run, with low levels of volatility of inflation, the performance of arrears has been improved. With increasing price levels, the ability of the borrowers to pay back loans

decreases. In a study on Pakistan, Rizvi & Khan (2015) used a quadratic regression and found that the level of inflation impacts NPLs both negatively and positively. Inflation reduces the purchasing power of consumers which consequently reduces economic growth.

#### 2.2.4.3. Unemployment & Lending Rate

The link between NPLs, lending rate, and unemployment could be seen through the life-cycle consumption model. According to this model, individuals within a low income bracket have a higher probability of default because of increased possibility of being unemployed. Low-income individuals with increased risk of being unemployed increase the chances of NPLs for the bank.

A higher loan rate will reduce the borrower's capacity for repayment, therefore the probability of loan default increases. Studies by Akinlo and Emmanuel (2014) and Nkusu (2011) find that a higher interest rate leads to an increase in the level of NPLs. Banks often charge higher interest rates to risky borrowers which already have a substandard record of repayment. This increases the chances of NPLs. This paper takes an annual average of Karachi Interbank Offer Rate (KIBOR) as the explanatory interest rate. This is the rate at which credit is extended by banks in Pakistan under the new market-based regime.

#### 2.2.4.4. Exchange Rate

Banks are likely to incur a higher level of loan losses in the case of an adverse movement in exchange rates. This would be especially true for banks who have lent in foreign exchange to unhedged borrowers, or if banks have an exposure to foreign currency and trade transactions. De Bock and Demyanets (2012) confirmed this relationship for 25 developing countries. Beck et al. (2013) also confirmed the positive association of adverse movements in exchange rate with an increase in NPLs for both advanced and emerging economies. This paper takes the exchange rate of Pak Rupee with the dollar and expects a negative relationship with NPLs.

### *2.3. Econometric Specification*

The **fixed effects model** will be used to analyze the impact of bank-specific and macro-variables on NPLs. , This model allows controlling for unobserved heterogeneity across banks. While this approach is rather simple and intuitive, it may give rise to "dynamic

panel bias", which results from the possible endogeneity of the lagged variable and the fixed effects in the error term. This can be avoided by applying the "**difference GMM**" method of Arellano and Bond (1991), which is designed for panel data having: 1) few time periods and greater number of individual entities; 2) dynamic left-hand-side variable, depending on its own lagged values; and 3) independent variables that are not strictly exogenous, suggesting that they are correlated to the past and/or current error terms. This technique transforms the data to first differences to remove the fixed-effect element and uses the lagged levels of the right-hand-side variables as instruments.

$$\Delta NPL_{it} = \alpha \Delta NPL_{it-1} + \sum_{j=0}^{1} \beta_{1j} exchangerate_{t-j} + \sum_{j=0}^{1} \beta_{2j} \Delta\pi_{t-j} + \beta_{3j} KIBOR_t + \sum_{j=0}^{1} \beta_{6j} GDP_{t-j} + \sum_{j=0}^{1} \beta_{4j} X_{it-j} + \sum_{j=0}^{1} \beta_{5j} Y_{it-j} + \mu_t + \varepsilon_{it}$$

$\pi$ is the change in the inflation rate. X is the matrix of all the bank-specific variables that will be included. Y is the matrix for the percentage share of total loans to the three selected sectors. A lag of one year for all the variables is used in the regression equation. Table 2 presents the summary of explanatory variables and their expected signs.

**Table 2: Summary of Explanatory Variables**

| Bank specific variables | Quantification | Hypothesis | Expected sign |
|---|---|---|---|
| ROE | Profits/Total Equity | **Bad Management:** Low cost efficiency is positively associated with increase in future NPLs | (-) |
| CAR | Owned Capital/Total Assets | **Moral Hazard :** Low capitalization leads to an increase in NPLs | (-) |
| Size | Ln of Total Assets | **Diversification & TBTF:** Diversification is negatively related to NPLs while Moral Hazard of TBTF leads to higher risk | (-)(+) |
| Lagged Total Loans | Lag of Total Loans | | (+) |
| Leverage Ratio | Total Liabilities/Total Assets | | (+) |
| Loans to Textile | Loans to Textile/Total Loans | **Credit Concentration:** Higher concentration, higher ri | (+) |
| Loans to Agriculture | Loans to Agriculture/Total Loans | | (+) |
| Loans to Energy | Loans to Energy/ Total Loans | | (+) |
| Indebtedness | Loans to Pvt sector/GDP | | |

| Macroeconomic variables | Quantification | Hypothesis | Expected signs |
|---|---|---|---|
| Economic growth | GDP growth rate | | (-) |
| Inflation | Inflation rate | | (+) |
| Unemployment | Unemployment rate | | (+) |
| KIBOR | Average KIBOR | | (+) |
| Exchange rate | Average exchange rate | | (-) |

## 3. Empirical Results and Discussion

The current study conducted a lag one-step GMM coefficients estimation for the first model that included all the bank-specific and macroeconomic variables. The estimation used the variables as regressors, while up to three lags of all variables were used as instruments. The results show that the performance of the economy as measured by GDP growth and unemployment. These findings are significant at 5% and 1% respectively, and negatively related to the asset quality of the banks. An increase in KIBOR increases the non-

performance on the loan portfolio, as does an adverse movement in the exchange rate. Both explanatory variables are highly significant at 1%. These findings conform to the expected signs and theoretical discussion in the previous section.

**Table 3: Regression Results**

Regression Results
Included 18 cross-sectional units
Including equations in levels
Dependent variable: NPL_TL

| | **Coefficient** | **Std. Error** | **Z** | **p-value** | |
|---|---|---|---|---|---|
| NPL_TL_(-1) | 0.0172954 | 0.00988056 | 1.7504 | 0.08004 | * |
| Const | -0.0104139 | 0.142792 | -0.0729 | 0.94186 | |
| Percentage_of _T | -0.000735596 | 0.00136233 | -0.5400 | 0.58923 | |
| Percenta | 0.00787903 | 0.000641368 | 12.2847 | <0.00001 | *** |
| Percentb | 0.00969191 | 0.00280428 | 3.4561 | 0.0005 | *** |
| Leverage_ratio | 0.18177 | 0.195756 | 0.9286 | 0.35312 | |
| SIZE_ln_TA | 3.8265 | 1.47078 | 2.6017 | 0.00928 | *** |
| CAR | -0.00337663 | 0.00167786 | -2.0125 | 0.04417 | ** |
| ROE | -0.918735 | 0.207799 | -4.4213 | <0.00001 | *** |
| Unemployment | -0.44642 | 0.16992 | -2.6272 | 0.00861 | *** |
| Inflation | -0.0049638 | 0.00745209 | -0.6661 | 0.50535 | |
| KIBOR | -0.0990278 | 0.0291992 | -3.3915 | 0.00070 | *** |
| GDP_Growth | 0.121626 | 0.0569404 | 2.1360 | 0.03268 | ** |
| Exchange_ra_1 | -0.00507038 | 0.00189236 | -2.6794 | 0.00738 | *** |

Sum squared resid 0.086737 S.E. of regression 0.064267

Number of instruments = 20
Sargan over-identification test: Chi-square(5) = 7.40865 [0.1920]
Wald (joint) test: Chi-square(14) = 125114[0.0000]

The paper also finds strong evidence of bank-specific variables having a profound impact on the asset quality. The share of advances extended to agriculture in total loans, and energy in total loans have a positive and significant relation to changes in NPL. This implies that banks have to diversify their credit portfolios in order to reduce the risk inherent in the nature of agriculture businesses. Contrary to expectation, the coefficient of share of textiles as a percentage of total loans has a negative relationship with asset quality even though it is not significant. This could be explained largely by the fact that the textile sector is the largest borrower from the banks, and they are treated as such: loans may be extended on favorable terms to maintain a long-term relationship. Moreover, manufacturing, of which textiles is a sub sector, is the single

largest contributor to the GDP of Pakistan. It may be less immune to cyclical anomalies and external shocks.

The size variable is positive and highly significant. This is supporting the Too Big To Fail Hypothesis whereby banks are becoming bigger through mergers and acquisitions as a policy of consolidation followed by the State Bank of Pakistan. However, in the process, banks may be extending high-risk credits to earn greater returns.

Bank profitability is a major function of management efficiency. This is further confirmed through the negative relationship between ROE and asset quality. A more pro-active management is able to make appropriate decisions with regards to sources and uses of funds. A well-performing credit portfolio would ensure better asset quality. This is further confirmed by the negative relationship between CAR and NPLs. A better-capitalized bank has a better asset quality.

The results remained robust when taking first difference of all the explanatory variables. The Sargan over-identification test and Wald test demonstrate that the model is accurate.

## 4. Policy Implications and Conclusion

Empirical results show a strong relationship between the macroeconomic performance of the economy and the asset quality of banks. This pro-cyclical behavior means that the regulators can predict the performance of banks based on position of the economy on the business cycle. In case of an eminent slow down, regulators can play a proactive role in strengthening the solvency position of banks through tightening liquidity and capital requirements, as well as imposing stringent risk management practices.

Within the bank-specific variables, share of loans to the agriculture sector has shown a positive relationship with deterioration in asset quality. This could be due largely to the unpredictable and seasonal nature of the farming business. Moreover, the access to formal credit has remained limited to this primary sector in the absence of specific regulations by the State Bank of Pakistan (SBP). However, the situation is now expected to improve as a result of the prudential regulations for the agriculture sector introduced by SBP in 2005 and revised in 2014.Given the empirical findings, banks should impose more stringent criteria of risk management and credit evaluation when extending agriculture credit.

Bank performance as measured by ROE and capitalization CAR is related to quality of management. This study provides both the banks and the regulators tools to identify the problem areas and take requisite action. The consolidation of the banking system in Pakistan through mergers and acquisitions may give rise to the TBTF moral hazard actions causing banks to relax their credit evaluation procedures and increase the systematic risk. It is suggested that regulatory authority be vigilant about the risk management practices of larger, as well as smaller, banks.

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# Corporate Governance, Disclosure Quality, and Cost of Equity: Evidence from Pakistan

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## Abstract

*The link between disclosure of corporate information and the cost of equity in firms is one of the most important issues in finance. This paper aims to examine the connection between corporate governance, disclosure quality of information, and the cost of equity in Pakistani-listed (PSX-listed) firms. Using the Generalized Methods of Movements (Sys-GMM) model, a sample of 167 non-financial firms listed on Pakistan Stock Exchange (PSX) for the period of 2011-2015was analyzed. Sys-GMM estimation was applied to overcome the problem of endogeneity among corporate governance variables. To test the robustness of GMM estimations, we compared the results of pooled ordinary least squares (OLS) and fixed-effect estimations and found they did not overcome the problem of endogeneity, providing spurious results. We found a negative association between cost of equity and disclosure quality of financial statements. The findings suggested that the board size, concentrated ownership and CEO duality, are found as significant factors in reducing the cost of equity of PSX-listed firms. Audit committee independence and audit quality of the firm showed a positive relationship with the firm's cost of equity. Our findings suggest that employing a high-quality auditor and independent director's results in increased cost of equity for PSX-listed firms. Furthermore, no significant relationship between independence of the boards and duration of the authorizations of financial statements by the board of directors is found. The results also revealed the investors demand more return on their investments if inadequate and incomplete information is disclosed in the annual reports of the firms. This study provides useful insights for Pakistani corporate governance regulators, the executive management of Pakistani firms, and their investors.*

**Keywords:** Corporate governance, disclosure quality, cost of capital, Pakistani listed firms

**JEL Classifications:** G30, G34,

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## 1. Introduction

The history of corporate governance has several scandals e.g. Tyco, Enron and WorldCom. These scandals have shaken investors' trust in the equity markets in the world of corporate governance. To reinstate investors' trust and to protect shareholders, regulatory authorities and professional organizations in developed countries adopt a code of corporate governance. To ensure accountability, responsibility, and transparency within organizations, U.S.A in 2002 introduced the Sarbanes Oxley Act. Later these corporate governance codes are accepted by majority of the nations and firms find it more virtuous to practice good corporate governance standards to gain their investors' trust.

Finance theory argues that managers in organizations have the potential to improve the firms value by reducing investors' ambiguity about the performance of the firms in the upcoming future. However, this uncertainty is inherent in business and can never be reduced. The corporate managers can eliminate discrepancies in the information among market participants (Botosan, 2000). The theory suggests that corporate managers can reduce the information asymmetries in two ways. First, by increasing the disclosure of corporate information to market participants, and second, by making available some private corporate information to the public. When such private information are provided to investors a lesser rate of return is also acceptable on investments, and ultimately lower the cost of financing for firms.

Current study is targeting two aspects affecting the equity financing of firms: disclosure quality and corporate governance phenomenon. Information disclosure is the means through which a firm's administration provides information about past events and predicts opportunities for future growth to all investors (Al Attar, 2016). The information disclosure in financial statements and cost of financing of the firm is becoming a more crucial point for management and investors. The literature on disclosure policies affecting the equity financing of the firms is one of the thought provoking question in the field of finance and accounts (Beyer et al.,2010). The literature provides theoretical understanding and mechanisms behind the presence of an opposite relation between disclosure in financial statements and cost of financing of the firms (Gao,2010; Easley & O'hara,2004). Studies by these researchers concluded that disclosures of accounting information is connected with reducing the cost of financing. Several researchers like (Hail, 2002; Kristandl & Bontis, 2007; Orens, Aerts & Cormier, 2010; and Richardson & Welker, 2001) have explored this relationship which Botosan (1997) first proposed.

There are multiple mechanisms behind the existence of the inverse relation between disclosure quality and financing of equity. In case more information is provided in the firm's financial statements, it enhances stock market liquidity and ultimately results in increased demand for the firm's stocks or reduces its transaction costs(Diamond & Verrecchia,1991;Ajina, Sougne, & Lakhal, 2015).Greater disclosure of information reduces the estimations-risk which may arise from investors' estimates of payoff distributions (Karkon & Mazhari, 2013; Barry & Brown, 1985; Clarkson, Guedes & Thompson, 1996).

There have been varied results depicting disclosure and equity capital relationship. One study highlighted that the cost of capital declines with disclosure, arguing that disclosure quality had improved the investor's welfare that benefits in reducing the cost of financing (Gao, 2010). However, another study Botosan (1997) confirms the absence of relationship between disclosure quality and financing equity cost. Though varied outcomes are found when examining linkage between disclosure quality and equity financing cost, some researchers have moved one step further to identify the mechanisms behind the existence of the negative relationship between information given in financial statements and cost of equity of firms. Several studies have revealed that more information in financial statements enhances the liquidity of the stock, which ultimately brings high demand for the firm's stock and reduces transaction costs (Demsetz, 1968; Diamond & Verrecchia, 1991; Glosten & Milgrom, 1985). Other propose that greater information disclosure reduces the estimation of risks which may arise from the investors' estimations of payoff distributions (Barry & Brown, 1985; Clarkson, Guedes & Thompson, 1996).

The second main aspect of this study, a good corporate governance phenomenon, is helpful in reducing the equity financing cost of firms by decreasing the risk of expropriation by the majority stockholders. The agency theory is the starting point on the debate on corporate governance because it explains that firm management and shareholders have agency issues (Jensen & Meckling, 1976). The agency cost arises when the management pursue for self-interest motives rather than shareholders' welfares. Therefore, it is imperative to set up an operative governance structure for the well-being of both the firm and shareholders. Robust corporate governance mechanism has an encouraging impact on the equity financing cost of the firm , however, these mechanisms generally are helpful for reducing the risk by firms and ultimately supportive for cost of equity of the firms (Donker, Poff & Zahir, 2008).

Studies conducted in developed countries with a high disclosure environment (e.g., U.S.A and Canada) found that cost of equity is reduced if more disclosure is provided (Richardson & Welker 2001; Botosan, 1997). Recently, researchers diverted their interests towards finding this connection in developing and emerging economies, where an inferior level of disclosure of corporate information exists. These studies focused on Brazil, China, Malaysia, and Pakistan (Lopes & de Alencar, 2010;Xiao-feng, Wei-ling, & Ming-yi, 2006;Embong, Mohd-Saleh, & Hassan 2012;Ali Shah & Butt 2009). The findings of these studies open an avenue for researchers to study the linage among corporate governance, disclosure quality, and firms' equity financing in an atmosphere where an inferior quality of disclosure exist. These studies provide evidence for an opposite relationship among corporate governance, disclosure quality, and financing equity cost.

The aim of the research is to explore the association amongst disclosure quality, corporate governance mechanisms, and cost of financing using equity of Pakistani firms registered on Pakistan Stock Exchange (PSX) for the time of 2011-2015.

The following questions are addressed by this study:

- Does the disclosure quality reduce the cost of equity capital of Pakistani firms?
- Which governance attributes contribute to reducing the equity cost?

To manage and control the corporate governance of the companies operating in Pakistan, the Code of Corporate Governance was set by Securities and Exchange Commission of Pakistan (SECP) in 2002[1]. These codes set the minimum benchmark for transparency about disclosure requirements, consistency in corporate practices, and governance standards. They provide rights to investors, particularly minority shareholders. SECP requires that all listed companies in Pakistan must follow these codes to operate their businesses in Pakistan. The code incorporates numerous proposals in accordance with a global standard of good practice. This code was an amendment of the Corporate Ordinance 1984, amended with the objective to fortify the rights of shareholders. The State Bank likewise ordered the utilization of the code for all recorded and non-recorded banks and Development Finance Institutes.

[1] Revised by SECP in April 2012

There are several reasons we have focused our research on Pakistan. First, Pakistan's economy is developing, and, like other developing economies, Pakistani firms have concentrated ownership structure and family-owned firms dominating the market. In this environment, many of the shareholders not only hold ownership of the organization, but also become part of the management. Second, according to the Companies Ordinance 2017, there are no protections for shareholders who have less than 10% shareholding. This research investigates the linkages exists between the ownership structure and equity financing in a developing economy context. Third, corporate governance and performance have extensively researched in the economy. In contrast, the studies on financing cost and corporate governance mechanisms are limited (Ali Shah & Butt, 2009 ; Butt & Hasan, 2009). These studies used corporate governance variables such as CEO duality, composition of board, and board size, find mixed results. Similarly, an inverse relationship was examined between size of the board and managerial ownership with cost of equity of Pakistani firms (Ali Shah & Butt, 2009). Further, a direct relationship was found between board independence and audit committee independence with equity financing. Finally, an Anglo-American model of corporate governance has adopted by Pakistan to support the governance standards in the corporate sectors. The question of whether this model is appropriate for Pakistan has been raised, as this model was created in countries from which Pakistan has cultural differences.

The Current study contribute to the ever-growing corporate governance literature within a developing economy, by examining the linkages between disclosure quality and equity financing of Pakistani listed firms for the years 2011-2015. It provides a detailed investigation of the quality of disclosure in the financial statements adopted by the firms and its relationship with equity. Required return calculated by the traditional method, i.e. Capital Asset Pricing Model (CAPM) is used as a proxy for equity financing cost. The corporate governance attributes used in this research include board size, CEO duality, board independence, ownership concentration, audit committee independence, time line of authorization of annual reports by board of directors, and audit quality. This study uses Sys-GMM estimations to analyze the relationships and to test the robustness of the relationships to which we applied the comparative analysis of OLS and fixed-effect estimations. The statistical results of the current research suggest that disclosure quality, board size, CEO duality, and ownership concentration are helpful to reduce the cost of equity of Pakistani firms, while audit quality and independence of audit committee are directly linked with the equity financing cost. The findings of the study can be used by investors as a guide in the financial market to

invest their finances with confidence in those firms that provide quality disclosure. The results of the study can effectively be utilized by the policy makers to make powerful governance policies so that the governance mechanism could be so effective for protecting the rights of the shareholders that investors could invest with full confidence.

## 2. Literature Review and Hypothesis Development

A usual argument in favor of corporate governance is that it affects the firm value and increases its future cash flow by limiting or eliminating the ability of managers and majority stockholders to excerpt private benefits. Corporate governance can influence firms' cost of equity via discount premiums applied to the firms' expected future cash flow. An increase in corporate governance and disclosure quality can decrease the information irregularity, leading to the reduction in uncertainty of future cash flow.

An operative Corporate governance structure is supposed to lessen the equity financing cost of firms in many ways. First, it controls and monitors the shareholders' and managers' actions, minimizing the risk of expropriation (Chen, Chen, & Wei, 2009). Second, better corporate governance practices reduce the information asymmetry and lessen the ambiguity about future cash flow (Verrecchia, 2001; Clarkson et al., 1996). Lastly, the quality of disclosure information by firms may cause a decline in the monitoring costs of outsider investors, causing lower demand on rate on investments, possibly leading to an increase in firm value (Lombardo & Pagano, 1999).

### *2.1. Disclosure Quality and Cost of Equity*

Numerous studies (Richardson & Welker, 2001; Hail, 2002; Gietzmann & Ireland, 2005) have analyzed the connection between disclosure and equity financing cost. A study by Botosan (1997) has analyzed the connection between disclosure level and equity financing cost in American manufacturing firms. The findings showed an inverse relationship between information quality and equity financing cost.

Kothari, Li, & Short (2009) by using content analysis have explored the disclosures outcome on cost of capital, forecast dispersion and return volatility. They analyzed more than 100,000 reports from analysts, news reporters, and disclosure reports from firm management. Their findings suggested that when a firm discloses favorable information it significantly reduces the firm's capital cost, forecast dispersion and its return volatility.

Chen et al. (2003) conducted a study in Asia's emerging markets to find the association between corporate governance disclosure and equity financing cost. OLS regression estimates are used for analysis, they found a positive impact of disclosure and other corporate governance variables on equity financing cost. These findings suggest that a country's investor safety laws and a firm's corporate governance approaches are imperative tools for reducing the financing cost of the firms. Khlif, Samaha, & Azzam(2015) investigated an emerging market, the Egyptian Stock Exchange, in a low disclosure atmosphere for the period of 2006-2009. The cost of equity was measured by CAPM. Multivariate analysis confirmed that disclosure plays a positive role for reducing the financing cost.

Poshakwale & Courtis (2005) examined the disclosure and equity financing cost of the banking industry. A total of 135 banks from Europe Australia, and North America are used as sample in the study. Variables as beta, price earnings ratio, price to book ratio, and firms' size are the control variables. The findings of this study suggest that an improved level of disclosure linked with the decrease of equity financing cost. However, European banks showed greater cost reduction in a high disclosure environment.

Kristandl & Bontis(2007) investigated the influence of voluntary disclosure on equity financing in Australia, Germany, Sweden, and Denmark for the year 2005, using 95 listed companies in these countries as sample. Using OLS regression, the results revealed that there is an inverse association between organizations' forward-oriented disclosure and equity financing, whereas a direct relationship exists between historical information and equity financing cost.

Michaels (2017) described a significant and inverse association between corporate social disclosure and firms' financing cost in a German setting. Dutta and Nezlobin (2016) have shown that disclosure is helpful to reduce the equity financing cost and for investor wellbeing. Their findings showed that a firm's financing cost is related with disclosure negatively for firms that have lower growth rate and vice versa. By reviewing the literature related to the disclosure quality and its association with financing cost, we want to re-examine the following hypothesis, in the context of the Pakistani market by using a robust methodology and an enhanced sample set:

**H 1:** Quality disclosure practices reduce the cost of equity capital for firms listed on PSX.

### 2.2. *Corporate Governance Mechanisms and Cost of Equity*

Theoretically, corporate governance incorporates mechanisms that ensure shareholders and creditors a return on their investments (Shleifer et al. 1997). Corporate governance mechanisms solve the agency issues of shareholders and management and seek to secure the rights of the minority shareholders in most of the developing economies. Confident investors feel protected and they contribute in capital markets more energetically and are ready to give more for the firm's financing. This ultimately enhances the firm value and reduces the cost of financing of the firm.

To find the link between corporate governance and cost of financing by using equity, many studies use either a composite corporate governance index (Gul, Rashid, & Muhammad,2016; Javid & Iqbal, 2008; Javid & Iqbal, 2010) while others use individual governance attributes such as board size, independence, independence of auditors, CEO duality and concentrated ownerships. For instance, Resmini (2016) studies Latin American companies to find the relationship between financing cost using equity and corporate governance. To measure the quality of corporate governance for Latin American companies' authors constructed the corporate governance index. The study spans from 2011-2013 and it includes 270 observations from 90 firms. The linear regression findings confirm that overall corporate governance is helpful in reducing the capital cost of the firms. By looking at individual components, they found that disclosure and board of directors are helpful factors for reducing the financing cost of firms while ownership structure and shareholders rights show no significant relationship with cost of equity.

Gul et al. (2016) explored the impact of corporate governance on cost of financing by using equity of small, medium and large Pakistani firms for the period of 2003-2014 using a sample of 200 firms. They used Weighted Average Cost of Capital (WACC) to measure the financing cost of Pakistani firms. Other variables used are corporate governance score, insider ownership, growth, debt ratio and firms' profitability. Using GMM estimations their findings suggest an inverse association between corporate governance of small, medium and large firms and cost of equity.

A study undertaken in Pakistan by Ali Shah & Butt (2009), considering the impact of corporate governance on equity financing using 114 listed firms as sample for the period of 2003-2007. Using OLS and fixed effect estimation the empirical findings suggests an inverse relationship between board size and managerial ownership with equity financing and a

direct connection between corporate governance, audit committee independence and board independence with equity cost of Pakistani firms.

In the existing literature on this question, most studies demonstrate an inverse association between corporate governance practice and firms' equity financing, but some studies also show that excessive regulatory control rises the firms cost of equity. Guedhami & Mishra (2009) conducted a study on 9 Asian and 13 Western European countries using a total of 1335 firms and found significant results that excess control increases the firm's equity financing, and both are positively related to each other. These results provide the first piece of indication of the direct relationship between excess control and equity financing. Similarly; Hope et al. (2009) investigated the effect of excess auditors remuneration on firms equity financing in global markets. The authors argue that when a high remuneration is paid to the auditor, the investors may think that there is lack of independence in firms because the auditor is economically bounded to the client. An information risk increase that is related to the financial statements of the firms and ultimately it leads to an increased cost of equity of the firm.

Timely and accurate information are very important for making timely and accurate decision. The lags in information transmission increase the uncertainty among investors and they demand higher returns on their investments. The company's financing cost using equity increases if there is lag of timely information e.g.(Evans, 2015). Afify (2009) investigated the corporate governance and audit report lags by using 85 Egyptian-listed firms. Regression results show that CEO duality, audit committee independence and board independence are positively linked with the audit report lag while ownership concentration is statistically insignificant for audit report lag. Similarly, Botosan & Plumlee(2002) reported that firms' equity financing decreases with increased level of disclosure in the financial statements but it increase when there is timely information disclosures. This is because stock volatility increases with timely disclosed information.

The corporate governance mechanisms and cost of equity literature has mix findings. The corporate governance mechanisms used here include CEO duality, board size, audit committee independence, board independence, ownership concentration, audit quality and timely authorization of annual reports by the board of directors. To evaluate the impact of governance mechanisms on the cost of equity financing in the Pakistani context, the following hypothesis are formulated:

**H 2:** Board size is negatively associated with the cost of equity of the firms listed on PSX.

**H 3:** Board independence increases the cost of equity of the firms listed on PSX.

**H 4:** The independence of audit committee is positively related with the cost of equity of the firms listed on PSX.

**H 5:** CEO duality decreases the cost of equity of the firms listed on PSX.

**H 6:** Concentrated ownership reduces the cost of equity of the firms listed on PSX.

**H 7:** Timely disclosure of information has a positive relationship with the cost of equity of the firms listed on PSX.

**H 8:** Audit quality has a positive relationship with the cost of equity of the firms listed on PSX.

## 3. Research Methodology

### *3.1. Population, Sample and Data*

The target population of this research study is companies listed on the PSX. Currently, there is a total of 580 companies listed on the PSX from 35 different sectors[2] with a market capitalization of Rs.9595.241 billion. We randomly selected 167 non-financial firms spanning different sectors for the period of 2011 to 2015. This research uses secondary data for analysis that is taken from the sample companies' annual reports, Pakistan Stock Exchange and State Bank of Pakistan's web site. We have excluded financial companies from the analysis because they have special disclosure requirements and the cash flow requirement of financial companies for reinvestment analysis are dissimilar from non-financial firms. The regulatory requirement of financial firms are more burdensome especially after financial the crisis of 2009.Capital is used differently in the two types of companies: a manufacturing firm raises funds and issues equity to invest in assets, whereas financial companies use debt like a raw material that is further used into more useful financial products. Because of such differences financial companies are not included in the sample(see for example, Gietzmann & Ireland, 2005; Orens et al., 2010; Ali Shah & Butt, 2009).

[5] Revised by SECP in April 2012; on 35 sectors. The information is collected as of April 12th, 2017 (www.ksestocks.com)

### *3.2. Methodology*

The current study is designed to test the influence of corporate governance (CG) and disclosure quality (DQ) on cost of equity (COE) of Pakistani firms, the dependent variable is COE and DQ and CG mechanisms are the independent variables. The following statistical techniques are used to test the hypothesis.

- Summary of Statistics
- Correlation matrix and variance inflation factors
- Ordinary Least Squares (OLS)
- Fixed effect estimations
- Generalized methods of moments (Sys-GMM)

Normality of the data is checked by analyzing the descriptive statistics. To test the multicollinearity among variables we apply a correlation matrix. The econometrics models used in this research are OLS, fixed effect and Sys-GMM estimations. The empirical studies based on OLS estimations could yield biased and unpredictable estimations because it entirely ignores the unobserved heterogeneity (e.g., Maddala, 1992). It is also expected that the econometric model faces bias because of the omitted variables. To address this problem we apply fixed effect estimations.

The issue is that our study uses the corporate governance variables and these variables are endogenous in nature as corporate governance variables are broadly inclined by its past performance. In that case dynamic endogeneity occurs (Wintoki, Linck, & Netter, 2012).The fixed effect model also eliminates the problem of endogeneity to some extent but it is valid only in assumption that previous performance has no influence on current corporate governance performance (Wintoki, Link, &Netter, 2012). Another estimation technique which overcomes the problem of endogeneity is Two-stage Least Squares estimates (2SLS). The 2SLS estimates apply instrument variables to solve the problem of endogeneity but proper exogenous instrument variables in the model must be identified and included. Identifying valid instrument variables in some cases can be difficult (see for example, Keane & Runkle, 1992).

We use panel data model Generalized Methods of Moments, predominantly System GMM (Sys-GMM) estimations, closely following Wintoki (2007) to overcome the problem of serial correlation, heteroskedasticity, simultaneity bias and dynamic endogeneity. The GMM model was introduced in the series of papers(Holtz-Eakin et al. 1988;

Arellano & Bond 1991;Arellano & Bover 1995 and Blundell & Bond, 1998).There are two primary types of GMM estimations have two types: difference GMM and system GMM. In this research we use system GMM estimates, also called Blundell & Bond (1998) estimator, because in the presence of high persistency among corporate governance variables, the difference GMM does not perform well. Sys-GMM estimator uses the lags of variables in level form to work as instrument variables in the model.

### *3.3. Operational Model*

To find the impact of CG and DQ, we apply the following equation:

$$COST = \alpha + \beta_1 SCORE + \beta_2 BS + \beta_3 BIND + \beta_4 AUIND + \beta_5 CDU + \beta_6 OC + \beta_7 TLINE + \beta_8 AQ + \beta_9 LSIZE + \beta_{10} NI + \beta_{11} LEV + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Equation (1) is the operational model that we used in this study. We run this equation under three estimates i.e. OLS, fixed effect and Sys-GMM. COST is the dependent variable, which is the cost of equity of sample firms, measured using CAPM. The independent variables included in our model are disclosure quality score, independence of board of directors, the size of board, CEO duality, ownership concentration, the independence of audit committee, time line of authorization of financial statements and audit quality. We use firm size, profitability and leverage as control variable in the model. Similarly,α and β are intercept and parameters of this model and ε represents the error term.

### *3.4. Variables*

#### 3.4.1. Estimating cost of equity

COE or capital represents the least rate of return that shareholders demand in return for their investments in a company, and for a company it is the cost of capital (Botosan, 2006). Many researchers use different approaches to estimate COE of a firm such as the price earnings growth model, average realized returns as proxy for expected returns, weighted average cost of capital (in firms bearing debt financing),and capital asset pricing model (Boujelbene & Affes, 2013;Hao, Zhang, & Fang, 2014;Khan, 2016). According to Botosan(2006) these approaches to calculate the cost of capital are divided into two classes. The first class uses market risk, predetermined price, and risk-free rates for estimation of cost of equity as CAPM. The second class considers COE as internal rate of return which

links the expectations of future cash flow to current stock (Gebhardt et al. 2001; Gode & Mohanram 2003;Easton 2004).

These estimation methods use current stock prices to forecast the anticipated rate of return. Choice of these methods largely depends on data availability and its application (e.g., Gietzmann & Ireland, 2005;Lee, Walker, & Christensen, 2006). For this reason, we use CAPM to estimate COE of Pakistani firms. The approach was widely used in similar studies (Khlif et al., 2015;Hearn, 2010;Ali Shah & Butt, 2009; Graham & Harvey, 2001;Bozec & Bozec, 2011). According to CAPM the cost of equity is:

$$COST_{it} = R_{ft} + (R_{mt} - R_{ft})\,\beta_i$$

COST = cost of equity

$R_{ft}$= risk free rate

$R_{mt}$= market rate of return

$\beta_i$= market risk (non-diversifiable risk)

### 3.4.2. Estimating the disclosure quality[3]

Disclosure quality is measured by assigning a score to each piece of info delivered in the PSX-listed companies' annual reports. The listed firms of Pakistan follow the external reporting criteria published by the joint committees of the Institute of Chartered Accountants of Pakistan (ICAP) and the Institute of Cost and Management Accountants of Pakistan (ICMAP). These criteria specify items that must be included in the annual reports of a listed firm. We assign points to the company for disclosure of information in their annual reports. There are six broad categories for score distribution which are as follows:

- Corporate objectives
- Director's report/Chairman's report/CEO overview
- Disclosure
- Stakeholders information
- Shareholders information

[3] Our study follows the same criteria as used by Nosheen & Chonglerttham (2013) for calculating disclosure quality scores. Details of this score distribution criteria can be provided by authors on request.

- Corporate governance

The aggregate of each section score represents the disclosure quality of a company. The same criteria for measuring the disclosure quality is used by Nosheen& Chonglerttham(2013) in the study for examining the impact of board leadership and audit quality on disclosure quality in Pakistani firms.

### 3.4.3. Corporate governance mechanisms

Literature provides the evidence that CG influences the firms COE (See for example Chalevas, 2011;Allegrini & Greco, 2013;Jallow et al., 2012). This study combines different CG attributes to measure the impact of CG on the COE of firms listed on PSX. This includes size of company board, independence of the board, independence of audit committee, CEO role duality, ownership concentration, time line of authorization of annual reports time line and audit quality. Table 1 illustrates the details about the variables used in this research.

**Table 1: Measurement of Variables**

| Variables | Abbreviations | Measurement |
|---|---|---|
| Cost of equity | COST | Cost of equity is the dependent variable; it is measured by calculating Capital Asset Pricing Model (CAPM) for sample firms. $COST_{it} = R_{ft} + (R_{mt} - R_{ft})\beta_i$ |
| Disclosure quality score | SCORE | Disclosure quality score is independent variable. The broad categories for SCORE distribution are Corporate objectives, Directors report, Disclosure, Stakeholders information, Shareholders information and Corporate governance. The score is allocated to these sections on the basis of information disclosed by each section and the aggregate SCORE is 100. |
| Board size | BS | Board size represents the total members of board in a company. |
| Board independence | BIND | Board independence is % of non-executive directors in total board size. |
| Audit committee independence | AUIND | Audit committee independence is the % of non-executive directors in audit committee. |
| CEO duality | CDU | CEO duality is a dummy variable. If CEO holds a position of the Chairman of the board also, we assign 0, otherwise 1. |
| Time line | TLINE | Time line is the time period of the authorization of financial statements by the board of directors. It is a dummy variable. If financial statements are authorized within 45 days of year ending we assign 1, otherwise 0. |
| Ownership concentration | OC | Ownership concentration is the block holder ownership of a company. The block holder of 10% or more is taken into account for concentrated ownership. |
| Audit Quality | AQ | Audit quality is measured by taking the ratio of audit fee to net sales for the year. |
| Leverage | LEV | Leverage is calculated by dividing long term debt with the total assets of a company. |
| Size of the company | LSIZE | Size is the total assets of the company. We take natural log of total assets of analysis purpose. |
| Net Income | NI | Net income is the total net income of the company after interest and tax. |

3.4.4. Other control variables

Other than the corporate governance variables, past studies provide evidence that there are some other firm level characteristics which can influence on firms' corporate governance practices. We use three firm level variables leverage, firm size and profitability are taken as control variable that may influence the cost of equity of sample firms. The details and measurement of control variables is given in Table 1.

Agency theory argues that larger firms face greater agency problems because of their complexity in capital structures(e.g., Chow & Wong, 1987; Bebchuk & Weisbach, 2010). The resource dependence theory explores that larger firms usually reveal more info in their financial statements to secure required resources (Pfeffer & Salancik, 1978). Studies confirm the positive and significant relationship between size of the firm and corporate governance compliance (Omar & Simon, 2011; Allegrini & Greco, 2013; Gupta & Sharma, 2014).Zhu (2014) investigates the inverse relationship between firm's size and COE.

According to Jensen & Meckling(1976) a firm that uses more external finance in its capital structure faces more agency problems because shareholders wants their money not to be involved in inefficient projects. Leverage offers tax savings but is also associated with the risk of default. Hence there was a direct relationship between firms' COE and leverage (Fama & French, 1992; Gode & Mohanram, 2003).

Both the signaling and agency theories argue that managers of the lucrative firms discloses more in order to sustain the position and remuneration (see for example, Haniffa & Cooke, 2002). Legitimacy theory offers the same argument that executives of profitable firms reveal more information to maintain their continued presence. We expect firm's profitability is negatively related with the COC because higher profits increase returns on assets and ultimately reduce the default risk(Zhu, 2014).

## 4. Results and Discussions

### *4.1. Summary of Statistics*

Summary statistics of the variables given in Table 2. COE has a mean value of 0.15 with a SD of 0.18 and a range of 1.1. The average disclosure quality score of sample firms is 68.46, with a large standard deviation of 23.08. The maximum and minimum score is 100 and 14 resulting in a range

of 86. The average board size is 8.26, with a range and standard deviation of 11 and 1.68 respectively. According to Lipton & Lorsch(1992) the ideal board size is 8 or 9 for efficient monitoring control. Our study reported the average board size falling within this range. Board independence and audit committee have a mean value of 0.55 and 0.71 respectively. This means the sample boards contained a greater number of outside directors, about 55% and 70% respectively. CEO duality and time line of authorization of annual reports by the board of directors are dummy variables and range from 0 to 1. The average CEO duality and time line in the current sample is 0.85 and 0.26 respectively. The summary statistics on ownership concentration show that sample firms have an average concentration level of 50% and a range from 0 to 99%. This means that most Pakistani firms are family controlled. The mean value of audit quality is 0.0037. The average leverage of sample firms is 0.12, which shows that most of the firms are relying on its internal rather than external financing. The average firm's size and net income of sample firms isRs.22748 and Rs.2383 respectively.

**Table 2: Descriptive statistics**

| Variables | N | Range | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|---|
| COST | 825 | 1.100 | 0 | 1.100 | 0.150 | 0.184 |
| SCORE | 798 | 86 | 14 | 100 | 68.458 | 23.076 |
| BS | 795 | 11 | 4 | 15 | 8.260 | 1.678 |
| BIND | 795 | 0.933 | 0 | 0.933 | 0.551 | 0.235 |
| AUIND | 789 | 1 | 0 | 1 | 0.709 | 0.329 |
| CDU | 798 | 1 | 0 | 1 | 0.850 | 0.356 |
| OC | 799 | 99.050 | 0 | 99.050 | 50.453 | 27.632 |
| TLINE | 797 | 1 | 0 | 1 | 0.263 | 0.440 |
| AQ | 798 | 1.102 | -0.003 | 1.100 | 0.004 | 0.043 |
| LEV | 801 | 3.702 | 0.000 | 3.702 | 0.128 | 0.212 |
| SIZE (Rs. In Million) | 801 | 553787 | 2 | 553790 | 22748 | 58118 |
| NI (Rs.in Million) | 800 | 133664 | -9749 | 123915 | 2383 | 10652 |

### *4.2. Correlation Matrix and Variance Inflation Factors*

Table 3 summarizes correlation results of all variables. Results demonstrate negative and significant relationships among COE and DQ score, board size ,CEO duality, and ownership concentration. DQ score is inversely associated with audit quality and directly related to all other variables. Similarly, board size shows positive and significant relationships with independence of board, independence of audit committee, CEO role duality, time line, size of the company, and leverage. Board independence shows positive and significant relationships with audit committee

independence, time line, and net income. The independence of audit committee is positively related with time line and net income. The CEO role duality is negatively related with ownership concentration, audit quality, leverage, and net income and ownership concentration are positively associated with time line, leverage, and net income. time line is positively and significantly associated with control variables size of the company and net income, whereas audit quality is negatively related with size of the company.

The above results show the bivariate relationship of used in our analysis. We apply variance inflation factors (VIF) to test the multicollinearity among variables, we apply for the dependent variable COE. VIF results are presented in Table 4, which shows the absence of multicollinearity as VIF scores of independent variables are less than 10 (Hair et al., 1995, and Belsley, Kuh, & Welsch, 2005).

**Table 3: Correlation matrix**

| | COST | SCORE | BS | BIND | AUIND | CDU | OC | TLINE | AQ | LEV | LSIZE | NI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **COST** | 1 | — | — | — | — | — | — | — | — | — | — | — |
| **SCORE** | -.023 | 1 | — | — | — | — | — | — | — | — | — | — |
| **BS** | -.017 | .329** | 1 | — | — | — | — | — | — | — | — | — |
| **BIND** | .172** | .137** | .212** | 1 | — | — | — | — | — | — | — | — |
| **AUIND** | .221** | .218** | .167** | .748** | 1 | — | — | — | — | — | — | — |
| **CDU** | -.132** | .271** | .153** | -.009 | -.063 | 1 | — | — | — | — | — | — |
| **OC** | -.018 | .126** | -.069 | -.068 | -.003 | -.110** | 1 | — | — | — | — | — |
| **TLINE** | .116** | .486** | .268** | .122** | .125** | .088* | .185** | 1 | — | — | — | — |
| **AQ** | .161** | -.071* | -.026 | -.023 | -.010 | -.078* | .000 | .023 | 1 | — | — | — |
| **LEV** | .034 | .001 | .014 | -.042 | -.037 | -.014 | .089* | -.041 | -.016 | 1 | — | — |
| **LSIZE** | .109** | .415** | .338** | .058 | .046 | .042 | .029 | .338** | -.173** | .085* | 1 | — |
| **NI** | .188** | .136** | .260** | .194** | .108** | -.115** | .117** | .182** | -.019 | .150** | .401** | 1 |

**Table 4: Variance inflation factors**

| Dependent variable: COST | | |
|---|---|---|
| **Independent variables** | **VIF** | **1/VIF** |
| SCORE | 1.790 | 0.559 |
| BS | 1.300 | 0.767 |
| BIND | 2.410 | 0.414 |
| AUIND | 2.400 | 0.417 |
| CDU | 1.160 | 0.865 |
| TLINE | 1.47 | 0.681 |
| AQ | 1.050 | 0.950 |
| LSIZE | 1.620 | 0.618 |
| LEV | 1.040 | 0.958 |
| NI | 1.350 | 0.743 |
| Mean VIF | 1.52 | |

### *4.3. Results of OLS, Fixed Effect and Sys-GMM Estimations*

Table 5 reports the results of hypothesis testing using ordinary least squares, fixed-effect, and Sys-GMM. First we run equation (1) under OLS estimations. Column (1) of Table 5 show the results. Our first hypothesis states inverse relationship between COE and DQ of PSX-listed firms. The results shown in table1 confirm that COE is negatively related to DQ as $H_1$ ($\beta$ = -0.0010, p <0.01). We accept H 1.The board size is significantly and inversely related with COE as $H_2$ ($\beta$ = -0.1460, p <0.01) hence H 2 is accepted. Similarly, audit committee independence, audit quality, time line of authorization, firm size, and profitability show significant and positive relationships with COE of Pakistani firms. This leads us to accept H4 and H 7 of this study. Equation (1) under OLS estimates does not control endogeneity as it faces the problem of omitted variables bias.

To address this problem we run equation (1) under fixed-effect estimates. The results are presented Table 5. Results reveal that under a fixed-effect model, only audit quality is significantly and directly associated with COE, whereas no other independent variables reach significance. The fixed-effects model results do not meet the objectives of this study, as a fixed-effects model assumes that corporate governance variables have no impact on its past and present performance (dynamic endogeneity), but in reality this does not happen in the case of such variables (Wintoki et al. 2012). To overcome the problem of dynamic endogeneity, we uses Sys-GMM which addresses the issue faced by OLS and fixed-effect models (Wintoki, 2007). Column (3) of Table 5 shows the result of the Sys-GMM estimations. They show that disclosure quality is significantly and negatively related with COE ($\beta$ = -0.0003, p <0.05), leading to the acceptance of H1.

Board size significantly and negatively contributes towards the reduction in COE, and ($\beta$ = -0.0030, p <0.01) supports the acceptance of H 2. Board independence does not reach significance with cost of equity hence H3 is rejected. Audit committee independence is shown to have a value of ($\beta$ = 0.0145, p <0.10), which indicates positive relationship with COE, hence we accept H4 of the study. H5 states that CEO duality is negatively related with COE of Pakistani firms. We found its value to be ($\beta$ = -0.0089, p <0.10) which proves a significant and negative relationship with cost of equity. Thus H5 is accepted. We found ownership concentration to have a significant and inverse relationship with cost of equity of Pakistani firms, as its value ($\beta$ = -0.0002, p <0.05) confirms. Hence, H6 of the study is accepted.

H7 claims that timely disclosure of information in annual reports time line causes a reduction of firms' COE. Results show this relationship with cost of equity does not reach significance, so H 7 is not accepted at the 1%, 5%, or 10% confidence level. H 7 is rejected. H 8 states that audit quality has a positive relationship with COE of Pakistani firms. Its value ($\beta$ = 0.9572, $p < 0.01$) supports our claim. H 8 is accepted.

Furthermore, control variables such as leverage and profitability do not have a significant impact on COE, whereas firm size is positively related to COE of PSX-listed firms.

**Table 5: OLS, fixed effect and Sys-GMM estimation results**

| Dependent variable: COST | | | | | | |
|---|---|---|---|---|---|---|
| | *1) OLS estimations* | | *2) Fixed effect estimations* | | *3) Sys-GMM estimations* | |
| **Independent variables** | **Coeff** | **P-value** | **Coeff** | **P-value** | **Coeff** | **P-value** |
| Constant | - 0.117 | 0.237 | 0.061 | 0.219 | -0.198 | 0.000*** |
| SCORE | - 0.001 | 0.000*** | 0.000 | 0.612 | -0.000 | 0.040** |
| BS | -0.146 | 0.000*** | 0.001 | 0.351 | -0.003 | 0.013*** |
| BIND | - 0.011 | 0.784 | 0.027 | 0.109 | -0.011 | 0.38 |
| AUIND | 0.139 | 0.000*** | -0.015 | 0.144 | 0.015 | 0.076* |
| CDU | -0.017 | 0.338 | 0.004 | 0.502 | -0.009 | 0.085* |
| OC | -0.003 | 0.108 | -9.670 | 0.954 | -0.000 | 0.041** |
| TLINE | 0.068 | 0.000*** | -0.004 | 0.786 | 0.006 | 0.292 |
| AQ | 0.695 | 0.000*** | 0.999 | 0.000*** | 0.957 | 0.000*** |
| LSIZE | 0.017 | 0.000*** | 0.002 | 0.307 | 0.012 | 0.000*** |
| LEV | 0.009 | 0.745 | 0.001 | 0.834 | 0.003 | 0.372 |
| NI | 2.312 | 0.000*** | -2.451 | 0.365 | -1.661 | 0.209 |
| Prob> F | 0.000 | | 0.000 | | 0.000 | |
| R-square | 0.161 | | 0.858 | | | |

Note: ***Significant at 1%
**Significant at 5%
* Significant at 10%

## 5. Summary and Conclusion

The primary objective of this research was to investigate the relationship between CG mechanisms, DQ, and COE of PSX-listed non-financial companies for the period of 2011-2015. We introduced CAPM to estimate the COE of Pakistani firms. There are several methods to calculate the COE. Easton (2004) and Gebhardt et al. (2001) use other methods in their studies but CAPM is still commonly used for computing COE. The

reason behind using CAPM in the context of Pakistani listed firms is the data availability.

The findings of this study reveal that DQ of financial statements is negatively related to the COE of Pakistani firms. This means a greater disclosure of information in financial statements causes a decrease in the firm's COE. Disclosure quality of Pakistani firms seems to be good as the average score of sample firms is 68.45 out of 100. Our findings are in confirmation with other studies of the Pakistani context (Gul et al. 2016;Khan 2016;Ali Shah & Butt 2009).

In this study efforts are made to find the effect of CG mechanisms on COE of PSX-listed firms. Our findings suggest that board size, CEO role duality, and concentration of ownership are significant and negatively linked with cost of equity. This means that larger boards, the combined role of CEO and Chairman, and concentrated ownership affect the cost of equity negatively. Most Pakistani listed firms are family-owned and have a large board size. In most of the firms, the role of CEO and Chairman is combined. These three indicators are considered a good sign for the reduction of cost of equity in PSX-listed firms. Further audit quality and independence of audit committee are positively related with COE firms. These findings recommend that employing a high-quality auditor and involvement of more independent directors in said committee ultimately increases the cost of equity of PSX-listed firms because of excess control. These findings are consistent with Butt & Hasan (2009), Guedhami & Mishra (2009), and Hope, et al. (2009). Moreover, board independence and time line of authorization of annual reports are not significant factors for cost of equity of Pakistani firms. The firms seeking to earn more profit and firms that are mainly reliant on external financing are also not significant for decreasing cost of equity. The firm's size has a positive relationship with cost of equity, as agency and resource dependence theory argues that larger firms face more agency problems. To solve this problem and to secure the required resources, firms are required to disclose more information in financial statements (Pfeffer & Salancik, 1978; Bebchuk& Weisbach, 2010).

The current research adds to the ever-growing literature to strengthen the agency theory in a developing economy, emphasizing the need for more disclosure and a strengthened governance structure for better economic and financial implications. Our study attempts to covers the limitations of previous research by using a robust methodology and an extensive measure of disclosure quality. The results highlight an important

issue being that investors invest in firms with greater transparency and that make efforts towards keeping their investors informed of the firm's activity. It is imperative for standard-setters to understand why firms should transform their disclosure quality to protect the shareholders' rights.

The current study has following limitations. The first is sample size, which consists of only 167 non-financial firms of PSX for a period of 5 years. The results may not be applicable to all PSX-listed firms. Secondly, this study measures the cost of COE Pakistani firms using CAPM; it is important to mention here that many researchers argue that CAPM is a biased proxy for COE can bias the estimations (Botosan, 1997). However, the approach is still widely used due to the issue of data availability, and models based on forecasted earnings per share is difficult to use. Furthermore, the findings cannot be generalized to developed countries or emerging markets. Despite these limitations, this paper does provide important insights. Future research may be carried out on a bigger sample panel study on the determinants of COE and DQ of annual reports. Using other methodology for measuring cost of equity may also be a path for future research.

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# Entrepreneurial Behavior among University Students: Empirical Evidence from Pakistan

**Syed Ahmad Hashmi*** **and Shamila Nabi Khan****

## Abstract

*Interdependent relationships among various psychological factors are instrumental in shaping university students' general behavior toward entrepreneurship. Our study explored these relationships and their contingent and moderating effects through various factors, such as need for achievement, self-control, and relational support, and how they influence entrepreneurial behavior, given the presence of variables like entrepreneurial intention, creativity, entrepreneurial self-efficacy, educational support, and personal attitudes. Primary data were collected through a questionnaire circulated among 300 respondents from two top-tier universities in Pakistan, followed by tests of reliability and validity both in SPSS and AMOS. The relationship testing was done through structural equation modeling using AMOS interpreted in terms of Alpha (at three significance levels) and Beta values for more regressed relationship testing. Results showed: a) significant behavioral tendencies of university students towards entrepreneurial behavior; b) the mediating effect of need for achievement was not significant among entrepreneurial intention and behavior relationship (however, this effect was significant when tested directly among these two variables); c) the moderating effect of self-control on the underlining variables was significant as a whole except for educational support; and d) relational support proved to moderate the relationship between personal attitudes and entrepreneurial behavior.*

**Keywords:** Entrepreneurial intention, self-control, personal attitude, entrepreneurial self-efficacy, need for achievement.

**JEL classification:** C12, C91, 125, I28, L26,

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## 1. Introduction

Entrepreneurship has become an emerging phenomenon in Pakistan over recent years. This movement is driven by young university students and graduates with a keen interest in entrepreneurship. Studying for a good job seemingly is no longer the norm for the youth of Pakistan. This is likely the reason why preference is increasingly given to owning a business and implementing knowledge acquired through university education into that business. Entrepreneurial behavior is the product of this transition away from previous norms that has taken place. Adjusting to this transition, leading universities in Pakistan are opening entrepreneurial centers for coaching and funding of entrepreneurial initiatives for youth. Our study asks what the driving force is that is making university students more interested in entrepreneurship and shaping their behaviors accordingly.

Few studies have been conducted in Pakistan to explore this phenomenon, and there is much to be discovered about students' entrepreneurial behavior in Pakistan. Entrepreneurial intention is the primary element that conditions the behavior of university students to become an entrepreneur (van Gelderen, Kautonen, & Fink, 2015), driven by a need for achievement within a student's mind. This need for achievement is natural and linked to the ambitions and goals an individual might have (Zeffane, 2013). Need for achievement is a mediating factor that is subject to further investigation as one of the initial driving forces of entrepreneurial behavior. Self-efficacy and creativity are other aspects that shape student behavior that this study investigates. These factors tend to vary among individuals and ultimately effect behavior positively or negatively with regard to entrepreneurship.

Underlying each of the other factors is self-control; exercised by the students and expressed in the form of a final decision, at which they arrived by rating and prioritizing entrepreneurial initiatives into their future plans of action. This study targets the effect of these aspects through a multidimensional variables study among university students. The success and failure rate of the entrepreneurial initiatives is linked to how well the entrepreneurial behavior is shaped during the university study tenure of a particular student (Valliere, 2015). As entrepreneurship generates a natural drive forward, attributes such as self-efficacy and self-control are instrumental with regard to final behavior shaping.

It is important to mention a few moderating factors investigated in this study. Self-control and relational support have a moderating effect on entrepreneurial behavior. These factors have a natural holistic impact which cannot be detached from either side. The aim of this study is to explore all the possible outcomes of such moderating effects and uncover the underlying principles, if any. Moreover, an aspect such as educational support is also considered vital for discussion in this study. The transition phenomenon mentioned previously is a definitive outcome of educational support. Entrepreneurial guidelines and concepts in the past have not been very accessible for students in university courses, but when it was made part of the curriculum, a need for such initiatives began to develop. Therefore the effect of related educational support on students should be considered when exploring. Behavior is shaped primarily by personality that has multiple attitudes embedded within it (Ghasemi, Rastegar, Jahromi, & Marvdashti, 2011). Therefore, personal attitudes also should be investigated as a motivating driver to become an entrepreneur. However, this cannot be done in isolation as factors such as relational support can facilitate attitudes (Gedik, Miman, & Kesici, 2015).

The way in which a person responds to a particular situation varies a great deal across individuals and that is perhaps what separates the generic from the exceptional. Personal attitudes towards entrepreneurial initiatives are more positive if there is the presence of relational support. This relational support can be an important factor in determining later entrepreneurial success (Turker & Selçuk, 2009). To formulate a final verdict regarding entrepreneurial behavior building among university students in Pakistan (van Gelderen et al., 2015), it is necessary to explore the significance of the relationship between personal attitudes and relational support. Considering the current state of economic affairs in Pakistan there is space in the market for entrepreneurship to expand exponentially. This is the market opportunity analysis surrounding the student entrepreneurial platform in Pakistan and entrepreneurial behavior clearly relates to this analysis. An idea sells; this is the primary notion that makes entrepreneurship attractive to university students, as the flow of information around the globe today is vast and it is quickly facilitated. This makes young minds more enthusiastic and passionate about entrepreneurship (Gaddam, 2007).

The central idea of this study is to match the factors which make university students interested in becoming entrepreneurs with the likelihood that they can be inventors of ideas that have global appeal. The method by which entrepreneurial behavior is shaped has been

investigated, identifying factors with positive links to this phenomenon. There are exceptions, but this study focuses on the main-stream entrepreneurial activity demonstrated by emerging university student entrepreneurs (Rauch & Hulsink, 2015).

Entrepreneurial behavior is a specific behavior that should be explored through the impact of underlying factors, with mediating and moderating aspects as well. The impact of these underlying factors – positive or negative - is under investigation. The causes of entrepreneurial behavior need to be assessed while considering the impact of the underlying factors. This study investigates entrepreneurial behavior as an outcome of intention, self-efficacy, educational support, personal attitudes, and creativity.

### *1.1. Theoretical Underpinnings*

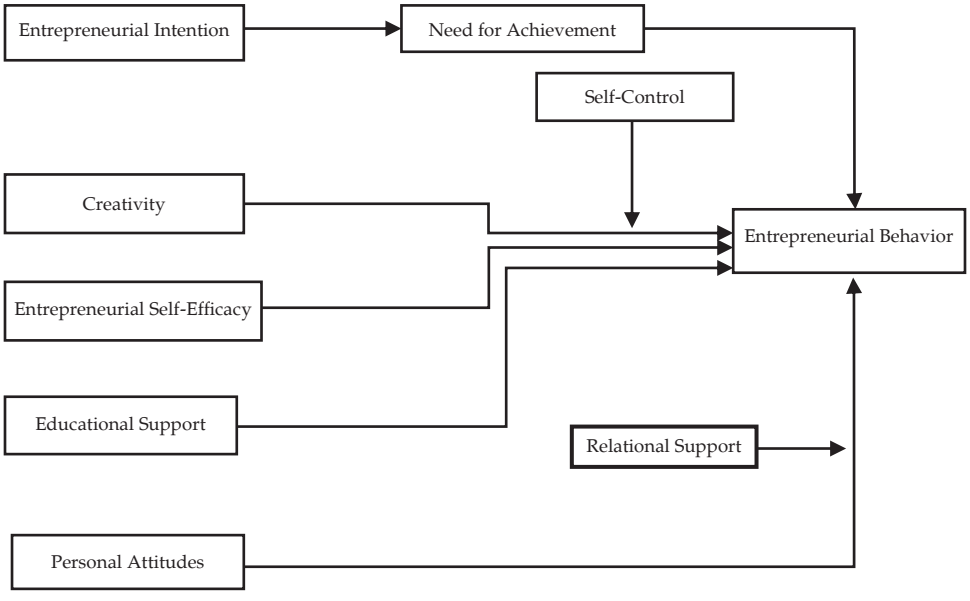
This study aims to explore the rationale behind the relationship between a selection of underlying variables and entrepreneurial behavior growing among university students. These underlying variables include entrepreneurial intention, creativity, entrepreneurial self-efficacy, educational support, and positive attitudes. The significance of these relationships is evident from the mediating and moderating relationships that exist in this proposed framework. The relationship between entrepreneurial intention and entrepreneurial behavior is subject to mediation by the need for achievement. Similarly, self-control moderates the relationship between entrepreneurial behavior creativity, and self-efficacy. In this study relational support moderates the relationship between positive attitudes and entrepreneurial behavior.

Entrepreneurial intention has a significant positive relationship with entrepreneurial behavior building that is mediated by the need for achievement. This relationship has been investigated in previous studies indirectly via explanation of the key aspects that drive entrepreneurial intention among university students. The student intent and urge to be an entrepreneur is explained by the fact that they can implement their ideas and thoughts in the work they can fully control and monitor (Turker & Selçuk, 2009), which eventually is a product of their high confidence level resulting in entrepreneurial behavior building that is driven by need of achievement originally (Okhomina, 2010). The primary governing characteristics of self-control are strength of intention and taking action (van Gelderen et al., 2015). Creativity also effects entrepreneurial behavior building as the extent to which a student is imaginative and artistic drives

his/her behavior to be an entrepreneur (provided the self-control moderation aspect) (Schmidt, Soper, & Bernaciak, 2012). The ability to create ideas and put those into action determines the entrepreneurial career choice among university students (Ishiguro, 2015).

Entrepreneurial self-efficacy determines entrepreneurial behavior building provided the moderating effect of self-control is present. This is mainly due to the fact that students discover, evaluate, and exploit entrepreneurial opportunities based on the confidence they have in their capabilities to be an entrepreneur (Saeed, Muffatto, & Yousafzai, 2014). It has been shown that entrepreneurial action is dependent upon entrepreneurial self-efficacy (Gielnik, et al., 2015). Educational support is another underlying variable that results in building entrepreneurial behavior among university students in the presence of the moderating effect of self-control. Educational support has a significant impact on perceived entrepreneurial behavior control (Yurtkoru, Kuşcu, & Doğanay, 2014), due primarily to it shaping the thinking and psychological dimensions of the human mind. For the variables creativity, entrepreneurial self-efficacy, and educational support, self-control is the moderating variable that inherently governs the impact of these underlying variables on entrepreneurial behavior of university students. Personal attitudes are a fundamental aspect of entrepreneurial behaviors and intentions (Gedik et al., 2015). This may be the primary reason for a proposed positive relationship between personal attitudes and entrepreneurial behavior in this study, in the presence of the moderating effect of relational support. Relational support is instrumental to this relationship because individuals who are motivated to become an entrepreneur feel supported if someone in their group of friends/acquaintances supplements their proposed efforts. Entrepreneurial initiatives are positively related to relational supports that primarily comprise sentimental and monetary cushions from family and friends (Turker & Selçuk, 2009). The theoretical framework is shown in Figure 1.

**Figure 1: Theoretical Framework**




Entrepreneurial behavior among university students has numerous causes associated with it that are explained by the underlying variables proposed in this study. Entrepreneurial behavior among university students is an outcome of various psychological and environmental aspects that shape a student's mind continuously during the course of their education at the university (Rauch & Hulsink, 2015). Entrepreneurial orientation that an individual develops over time also explains the entrepreneurial behavior that is displayed through the future course of actions in which he/she is involved (Moruku, 2013).

The interaction among different influencing factors and variables on entrepreneurial behavior (Gaddam, 2007) create a chain of interconnecting concepts that explain this entrepreneurial behavior. These factors can be the level of creativity, self-control, and basic intent to opt for self-employment. Entrepreneurial behavior is a holistic and dynamic process (Nitu & Feder, 2012) driven by opportunities and self-capability analysis performed by an individual. The summation of the aspects of entrepreneurial behavior building converge at the theory of planned behavior (Ajzen, 1991) that states that behavior is composed of a systematic set of thinking processes that an individual undergoes over time (van Gelderen et al., 2015).

Further, Krueger, Reilly, and Carsrud (2000) focused on intention shaping over time as it is linked to the continuous thinking processes taking place within an individual. Most importantly, the opportunities and threats against a potential business idea, as well as surrounding factors like availability of funds and economic conditions of a country, dictate how a young entrepreneur pursues his/her business plan. Souitaris, Zerbinati, and Al-Laham (2007) further expanded the landscape of student entrepreneurship by tapping the science and technology student base, investigating how their subsequent intentions can be shaped with regard to new business ideas and plans.

Entrepreneurship education as a means of awareness has been highlighted in this study and has been linked to inspiration as an emotional element behind the planned behavior. The personal attitude complement has also been touched upon as having a contingent effect on behavior. Intention-causing action was endorsed by this study. Ahmed et al. (2010) focused on entrepreneurial career building having a dependency on various personality traits and demographic aspects that contribute to the attitude of university students in Pakistan towards self-employment. Innovativeness in the thinking processes was weighed appropriately in the analytical conclusions: that is the intention that motivates a student to pursue entrepreneurship, and only then if the thinking processes are broad, and inspired by the right frame of reference can it emerge as a substantial venture.

As has been stated previously, there are numerous underlying factors that lead to an increase in entrepreneurial behavior among university students. The relevance of each of these factors is under investigation in this study.

### *1.3. Discussion of Constructs*

#### 1.3.1. Entrepreneurial Intention

Entrepreneurial intention is highlighted in various studies as a primary factor directing entrepreneurial actions (Moruku, 2013). The behavioral aspect of entrepreneurship is used as an embedded element within entrepreneurial action. According to Linan (2008), entrepreneurial intention emerges as a combination of cognitive processes that drive the behavior of an individual towards entrepreneurial initiatives. The same study validated the positive relationship between behavioral control and entrepreneurial intentions. The most significant predictor of human

behavior is the intention of an individual (Krueger, 2008). This aspect has been explained in the context of entrepreneurial behavior as building dependently with the underlying intentions (Yurtkoru, et al., 2014). Overall studies have uniform findings regarding the positive relationship between these two variables (Turker & Selçuk, 2009; Valliere, 2015; Ozgul & Kunday, 2015).

### 1.3.2. Entrepreneurial self-efficacy

According to Gielnik, et al. (2015) self-efficacy is an action regulatory factory that governs the extent of entrepreneurial actions and behaviors. The self-beliefs of possessing the ability to undertake and successfully perform entrepreneurial functions have been validated by various studies (Townsend, Busenitz, & Arthurs, 2010). The point of explanation here is the general tendency of individuals to believe in their instincts that they can opt for self-employment initiatives and succeed in practical life. In various studies a direct positive impact of self-efficacy on entrepreneurial behavior has also been identified (McGee, Peterson, Mueller, & Sequeira, 2009). This signifies the fact that entrepreneurship as a behavior is not just confined to some behavioral theories, but in fact comprises prompt thinking processes and actions like self-efficacy.

### 1.3.3. Creativity

Various studies have identified creativity as foundational for effective entrepreneurial actions (behaviors inbuilt). This aspect attempts to explain the out-of-the-box abilities and solutions that an individual may have that stand out as a qualification to be an entrepreneur. According to Ishiguro (2015), MBA students rank low as compared to entrepreneurs in two factors namely autonomy and creativity. Student entrepreneurship needs to have creativity as well other aspects to be competitive in the self-employment industry. Hamidi, Wennberg and Berglund (2008) found that high ratings on creativity drove positive entrepreneurial intentions.

Fillis and Rentschler (2010) found that entrepreneurial experience alone is not the dominant aspect in entrepreneurship, as it must be paired with creativity to lead to successful entrepreneurship. Thus, creativity is an important underlying factor that should be investigated in student entrepreneurship.

### 1.3.4. Educational Support

Previous research studies have focused on educational support as a prerequisite for entrepreneurial career selection and behavioral makeup (Turker & Selçuk, 2009). Various studies are of the opinion that degree programs in universities and colleges must focus on entrepreneurial initiatives study as compulsory (Couto, Mariano & Mayer, 2014). This would have the effect of shaping the students thought processes. According to Yurtkoru et al. (2014) educational support is positively related to behavioral control. This illustrates the necessity for the course content of universities and colleges to have a considerable number of entrepreneurship guidelines so as to refine the self-employment abilities of individuals. All studies therefore have converged upon the same notion that entrepreneurship needs to be taught so that it becomes a general phenomenon (Turker & Selçuk, 2009).

### 1.3.5. Personal Attitudes

Personal attitudes have been identified in past studies as a part of the theory of planned behavior (Ajzen, 1991). The literature suggests that personal attitudes directly impact entrepreneurial behavior patterns (Turker & Selçuk, 2009). Attitude has been explained by various studies as the basic way of responding to an underlying task. Linan (2008) explains that the personal attitudes of an individual are driven by values and evaluations of the entrepreneurial activity of the larger society to which he/she belongs.

This is merely a reflection of social acceptability of entrepreneurial initiatives which ultimately shapes the attitudes of individuals. Studies have converged upon the point that both males and females exhibit a positive and energetic attitude towards becoming involved in entrepreneurial activities (Gedik et al., 2015).

### 1.3.6. Need for Achievement

The role of need for achievement as a mediator in the relationship between entrepreneurial intention and entrepreneurial behavior has not been investigated directly in previous research, but some indirect relationship derivations have been seen in the literature with regard to this mediating role. According to Zeffane (2013), young adults have the most intense need for achievement when faced with the challenge of being a successful entrepreneur. The mediating role is validated indirectly as the

intention to express entrepreneurial behavior naturally comes prior to exhibiting the intended behavior (Zain, Akram & Ghani,2010). Many researchers have concluded that need for achievement is significantly related to entrepreneurial activity (Segal, Borgia, & Schoenfeld, 2007). Based on previous studies the mediating role of need for achievement is likely to be important as entrepreneurial potential is largely driven by such factors.

1.3.7. Self-control

Past studies have no direct evidence regarding self-control's moderating effect on the relationships of entrepreneurial self-efficacy, creativity, and educational support with entrepreneurial behavior. However, traces of such moderating effects are present in some studies. Van Gelderen et al. (2015) explains self-control as the ability to exercise willpower and the subsequent moderation exerted upon intention and action validates the proposed relationships.

Schlaegel's and Koenig's (2014) meta-analysis of the intention and action gap in entrepreneurship also explains the likely fit of self-control as a moderator in the proposed relationship. Several studies conclude that self-control is instrumental to behavior of all sorts, including entrepreneurship (Gross, Richards, & John, 2006).

1.3.8. Relational Support

Past research has observed no direct evidence of the moderating effect of relational support in the relationship of personal attitudes with entrepreneurial behavior. However, relational support is documented in the literature with regard to its impact on entrepreneurial behavior (Yurtkoru et al., 2014). In its findings, this study reported that relational support significantly impacts both entrepreneurial intention and behavioral control. Other studies have considered relational support as a subjective norm that also impacts personal attitudes (Turker & Selçuk, 2009). Past studies have merged the relational support aspect with the social networks of an individual which supplement his/her entrepreneurial behavior (Kraaijenbrink, Groen, & Bos, 2010). Studies have converged upon the point that the career choice to become an entrepreneur is driven largely by the psychological comfort zone of having some relational or social network support (Dwyer & Cummings, 2001).

### *1.4. Empirical Setting*

The research conducted in Pakistan on the entrepreneurial behavior building elements of university students are limited, as they generally lack a point of convergence as to what governs the ultimate drive of entrepreneurship among university students in Pakistan. Tanveer et al. (2011), made an attempt to analyze the factors that act as a barrier for business students to become entrepreneurs. The study tapped the subjective norms as part of a theory of planned behavior and identified weak financial resources and weak economic conditions of the country as discouraging influences on the entrepreneurial intentions of business students. Aslam, Awan, and Khan (2012) laid emphasis on family background as being the fundamental aspect controlling entrepreneurial behavior.

According to this study, personal attitudes are shaped by a family background that corresponds to any sort of business activity. However, this research did not explore the multidimensional underlying factors of self-efficacy or creativity. Tanveer, Shafique, Akbar, and Rizvi (2013) conducted research on the intentions of business graduates and undergraduates to become entrepreneurs. This study focused on factors like role of gender, entrepreneurial education, and the role of the university in shaping the intentions of students. The study pointed out that students have a clear perception of what having a job entails, rather than being self-employed. This can be attributed to the factors under analysis, as the aspect of intention judgment was not considered; for example, the role of the university was not considered instrumental to entrepreneurial intention-building in any way. Similarly, Sial and Chudhry (2011) conducted a comparative study on the low inclination toward entrepreneurship of business students in Islamabad. The primary limitation of this study was its sample size of only 20 students from various universities in Islamabad.

This research concluded that entrepreneurial orientation is very low among the business students in the city of Islamabad. However, this study did touch upon factors like entrepreneurial education and risk levels underlying the behavioral control. Saeed et al. (2014) conducted a comprehensive study on entrepreneurial education among Pakistani university students that included measurement items such as need for achievement and risk-taking propensity to explain how entrepreneurial education can supplement the intention to become an entrepreneur. However, factors such as self-control, creativity, and behavioral pattern-shaping were not part of this study. The literature is incomplete with

regard to the study of entrepreneurship behavior in Pakistan. Perhaps there is a gap to be filled through further research on this behavior. See Table 1 in the Appendix for Findings of Research on Student Entrepreneurship in Pakistan.

## 2. Research Methods

### *2.1. Measures*

The proposed framework attempts to explain the influence of some behavioral and psychological aspects that are responsible for introducing entrepreneurial behavior among university students in Pakistan. This behavior does not occur naturally; instead the factors proposed in the study are expected to influence such behavior. Entrepreneurial intention is mediated by the need for achievement within an individual that ultimately acts a motivator for him/her to behave in an entrepreneurial manner. This generates the motivation for the individual to get involved in self-employment activity, rather than the traditional job search. Self-control corresponds to the stability and proper utilization of senses to act rationally. This rationality factor is also a substantial moderator of some other relationships in this proposed framework. Creativity is considered the clarity of an individual's thoughts to think beyond his/her capabilities and horizons; it is also moderated by self-control to ultimately influence student entrepreneurial behavior. Creativity is the single element that enables entrepreneurial activity to achieve exceptional results in terms of growth and expansion. This aspect relates to innovative solutions to existing gaps or problems in the business landscape. Entrepreneurial self-efficacy explains the internal systems' harmony within an individual that gives him/her the courage to believe in his/her instincts to opt for self-employment.

Entrepreneurial self-efficacy is also moderated by self-control which fine tunes an individual's efficacy to start his/her own business venture in a self-sustained manner. This involves prudent use of available resources and selecting reasonable investments to nourish the business operations. Educational support has also been proposed to impact entrepreneurial behavior, moderated by self-control. This explains the phenomena that educational courses on entrepreneurship are instrumental to an individual's thought processes. During the shaping of these thought processes, stability of decision-finalizing and correct decision-making is highly dependent on self-control exercised by an individual. Moreover, personal attitudes have also been proposed in this framework as a factor impacting entrepreneurial behavior, but the moderating impact in this

relationship requires further explanation to develop proper understanding. Relational support being a morale support, as well as a source of financial assistance through peers and family, influences personal attitudes and tendencies to become self-employed. Through the entire framework we intend to analyze entrepreneurial behavior across numerous aspects so as to create a clarified view of what causes such behavior.

### *2.2. Sample*

The sample size determination was based on convenience sampling of 350 university students from two top tier business schools of Lahore. This was to ensure that there were two sets of contrasting opinions with regard to the questionnaire survey used to investigate the impact of underlying factors on entrepreneurial behavior. The sampling was not random because it was naturally based on selection on the part of the surveyor while moving through the various premises inside both educational institutions. There is no anchor study to follow as the questionnaire is wholly targeted at university students and not the general public.

The socio-demographic aspect in terms of student entrepreneurship needs consideration as one business school draws from areas of higher socio-economic status for its student body, whereas other draws students from all over Punjab and varied socio-economic levels. The combination of the questionnaire results from both institutions may produce diversified data to be analyzed. This is a primary reason why no anchor study has been used for sample size determination.

### *2.3. Questionnaire*

For this research, data collection was conducted via a questionnaire comprising a combination of instruments. Questionnaires related to each of the independent, mediating, moderating, and dependent variables have been merged together to make a single comprehensive questionnaire that the respondents were provided. A total of 38 items is under investigation with varying scales of measurement used.

Self-control was measured on a 5-point Likert-style scale (Tangney, Baumeister & Boone, 2004). Entrepreneurial intention, educational support, relational support, and personal attitude was measured on a 5-point Likert-type scale ranging from "strongly agree" to "strongly disagree" (Entrepreneurial Intention Questionnaire (EIQ) scale developed by Liñán and Chen, in 2009) (Liñán & Chen, 2009).

The entrepreneurial behavior measurement was based on questions from three different sources: the PSED study (Gartner & Carter, 2003), the Global Entrepreneurship Monitor (Reynolds, Hay & Camp, 1999), and the Chamber of Commerce (Rauch & Hulsink, 2015). This resulted in the creation of a list of 19 behaviors linked to entrepreneurship. To create a single scale for entrepreneurial behavior, binary yes–no questions were connected to these items (as suggested by Alsos & Kolvereid, 1998,; Gartner, Carter, & Reynolds, 2010; Souitaris et al., 2007). Creativity is measured on a 5-point scale: (a) "agree" to (d) "disagree", as has been proposed by a past study as a means of common factor analysis (Ishiguro, 2015). Need for achievement is measured on a 5-point Likert scale ranging from 1"completely disagree" to 5 "completely agree" formulated by Carter et al., 2003. Entrepreneurial self-efficacy was measured using a 5-point rating scale (1 = "very little confidence" to 5 = "complete confidence") (Carr & Sequeira, 2007). A description of each questionnaire used in this study is presented below. See Table 2 in the Appendix for Instrument Description.

### *2.4. Data Collection Procedure*

The data collection procedure involved primary data collection through questionnaires given to students on the premises of a university. The questionnaire is interesting as it features elements common in conversation among university students relating to career selection. A higher response rate can be expected in this regard. However, an important aspect of procedure is the proper explanation of research protocol and resolution of any questions that the respondent might have while completing the questionnaire. This questionnaire is self-administered. As the MBI manual (Maslach, Jackson & Leiter, 1996) has advised, respondents fully completed the questionnaire and avoided discussing the questionnaire items with others; this helped to reduce response bias. Questionnaires containing any unfilled sections or with double-option selections were identified and those questionnaires were eliminated from the study.

### *2.5. Data Analysis*

This section aims to provide empirical evidence for the relationships proposed by the research hypothesis of the study. Reliability and validity of testing instruments formed part of analysis with the prime intent to substantiate the significance of the study. Entrepreneurial behavior-building was proposed to be based on several factors, among which statistical tools like SPSS and AMOS restricted some variables from

further study; the framework was amended to reflect this. Analysis of entrepreneurial behavior-building was regression tested in AMOS with a p-value at three significance levels (1%, 5% & 10%). Analysis of beta values was the basis of the structural analysis to follow.

Essential elements of a good test are the validity and reliability of the items within a questionnaire. The appropriateness and meaningfulness of the test results is referred to as validity. Both construct reliability (SPSS) and composite reliability (AMOS) formed part of the analysis. Confirmatory factor analysis (CFA) is the primary basis of validity and reliability testing. Divergent validity and factor loading of individual questions is also applied. The degree to which individual items in a questionnaire comprising the test is correlated with each other or with the total of the test is referred to as the internal reliability and Cronbach's coefficient alpha measure is used in this regard.

Comparisons of reliability estimates in terms of construct reliability provided by SPSS and composite reliability provided by AMOS analysis formed part of the explanations. Convergent validity and divergent validity testing was used to support the inclusion of items in the questionnaires, as proposed in previous studies (Zapkau, Schwens, Steinmetz & Kabst, 2015). The relationship testing was based on similar relationship comparisons as utilized by various international studies. It has also been ensured that response diversity with regard to respondents' background is multivariate so as to have a close estimate of student entrepreneurial landscape within and across Pakistan (Usaci 2015). The primary analysis used was a CFA along structural model fit.

All variables were analyzed using correlations. Means, standard deviations, and percentiles analysis of each variable were calculated. There were five independent variables, two moderating variables, one mediating variables, and one dependent variable. Each component's analysis was done to evaluate the general responses for each variable prior to conducting the main analysis and testing of the relationships in AMOS. A general correlation analysis among all the variables allowed us to develop a basic foundation for relationship testing and provided a notion as to what sort of relationship this study is proposing compared to what is already present in the literature. See Table 3 in the Appendix for Descriptive Statistics.

These descriptive statistics highlight the relative importance of each variable in this study with regard to overall student responses.

Similarities between each of the variable means indicates that a majority of respondents showed inclination towards accepting the variables that ultimately resulted in entrepreneurial behavior-building or were a source of entrepreneurial behavior. The deviations about the mean also were consistent with the mean interpretation stating that there is unanimity in terms, factors, and causations. See Table 4 in Appendix for Correlation.

Entrepreneurial intention is significantly positively correlated with relational support, need for achievement, self-efficacy, creativity, personal attitudes, educational support, and entrepreneurial behavior. However, it is negatively correlated with self-control. Self-control has a significant relationship with self-efficacy, creativity, and educational support. This suggests that among these important variables, the element of self-control is detrimental. These descriptive statistics explain that entrepreneurial behavior has a strong relationship with all the underlying variables except for need for achievement. This was further tested in AMOS.

Test of validity was done primarily in AMOS for this study. The CFA Table was the basis for testing the discriminant validity and convergent validity of all the underlying variables, which was a depiction of overall construct validity. The validity measures tested how well the questionnaire used in this study measured its claims as a relevant test tool. Factor loading comparisons formed part of analysis in this section to test the validity of individual questionnaire items. See Appendix for Table 5 on CFA.

The convergent validity figures for all variables ranged from 0.4 to 0.5, with the exception of the variable creativity that had a convergent validity of less than 0.4 (Crook, Shook, Morris, & Madden, 2010; Short, Ketchen, Combs, & Ireland, 2010). The theoretical relationship between measures of constructs was tested by convergent validity (Mullen, Budeva, & Doney, 2009). However, in the case of creativity the reliability was lower than that, and the reliability analysis that follows was used to further analyze this variable. Divergent validity was also satisfactory in accordance with the standard ranges for all variables (Zapkau et al., 2015). See Table 6 in Appendix for Factor L.

Factor loading in CFA (AMOS) for each item should not be less than 0.4 (Ford, MacCallum, & Tait, 1986). The factor loadings of all the items supported by the literature are available. Those items without support in the literature are in line with the standard loading estimates. Factor loadings here intend to validate that the items included in the

questionnaire reflect previous literature findings. The included items have already been tested in various other research studies. See Tables 7 and 8 in Appendix for Reliability Tests.

In this study, both composite and construct reliability testing form part of the tests for reliability. With regard to the literature, all the anchor articles support the composite reliability figures generated by the AMOS covariance analysis. Composite reliability has more regressed values for Cronbach's Alpha than construct reliability in SPSS. A prior check for reliability was conducted in SPSS for construct reliability to better equip the data analysis before AMOS testing. The research findings for reliability are in accordance with the recommendations given in the literature: .60 to .70 alpha value (Mullen et al., 2009). High consistency is indicated by Cronbach's alpha values ranging from .73 to .97 (Nunnally, 1978).

### *2.6. Hypotheses Testing*

**HI.** There is a significant relationship between entrepreneurial behavior and entrepreneurial intention given the mediating effect of need for achievement.

**Regression Weights: (Group number 1 - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | EI | .059 | .002 | |

The basic direct relationship between the independent variable and entrepreneurial behavior is significant with 1% significance level as the p-value = .002. $\beta$ = 0.059 indicates that a unit increase in entrepreneurial intention resulted in 0.059 unit increase in entrepreneurial behavior. The mediating effect of need for achievement was not to be considered until now. Need for achievement previously had been proposed in the literature as having a positive effect on the entrepreneurial potential of an individual (Zeffane, 2013). However, until this study, mediation of need for achievement had not been proposed. Yurtkoru et al (2014) proposed a positive relationship between entrepreneurial intention and behavioral control (most likely in terms of entrepreneurship). After running the three staged mediation for need for achievement (NEDA) among entrepreneurial behavior (ENTB) and entrepreneurial intention (EI) the following AMOS findings were available.

**Standardized Direct Effects - Two Tailed Significance (PC) (Group number 1 - Default model)**

| | EI | NEDA | ENTB |
|---|---|---|---|
| NEDA | 0.059 | ... | ... |
| ENTB | 0.001 | 0.010 | ... |

**Standardized Direct Effects - Two Tailed Significance (PC) (Group number 1 - Default model)**

| | EI |
|---|---|
| ENTB | 0.010 |

**Standardized Indirect Effects - Two Tailed Significance**

| | EI | NEDA | ENTB |
|---|---|---|---|
| NEDA | ... | ... | ... |
| ENTB | 0.068 | ... | ... |

| Variables (NEDA as mediator) | Direct (without mediation) | Direct (with mediation) | Indirect (with mediation) | Result |
|---|---|---|---|---|
| EI→ ENTB | 0.010 | 0.001 | 0.068 | **No mediation** |

The results highlight that although relationships among the independent variable and mediator, and the dependent variable and mediator are significant based on the p-value, the relationship between independent and dependent variable in the presence of the mediator is not significant to the same level. This is the direct relationship, so there is no need for such mediation to be ranked as significant as had been reported in literature previously. Therefore, the alternative hypothesis is rejected.

**H2.** There is a significant relationship between entrepreneurial behavior and creativity given the moderating effect of self-control

**Regression Weights: (Group number 1 - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | CTV | 0.110 | 0.009 | |

**Regression Weights: (NO - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | CTV | 0.253 | *** | W4_NO |

**Regression Weights: (LOW - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | CTV | .251 | *** | W4_LOW |

**Regression Weights: (HIGH - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | CTV | 0.235 | 0.002 | W4_HIGH |

Creativity and entrepreneurial behavior have a significant relationship when directly compared and analyzed. The p-value = 0.009 indicates which the direct relationship is significant at 1% significance level. β = 0.110 which indicates that a one unit increase in creativity resulted in 0.110 unit increase in entrepreneurial behavior. Florida (2009) supports this fining. However, moderation on high-, low-, and no-level needs to be analyzed by using self-control as the moderator. According to van Gelderen et al. (2015), self-control moderates the relationship between intention strength (which can be considered as creativity) and taking action (entrepreneurial behavior) such that the impact of intention strength on taking action was significant when self-control was high. Our findings also provide evidence for this with p-value at 1% significance ($p$ = 0.002) and a high beta estimate. Therefore, the alternative hypothesis is supported.

**H3.** There is a significant relationship between entrepreneurial behavior and entrepreneurial self-efficacy given the moderation effect of self-control

**Regression Weights: (Group number 1 - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | F1 | 0.073 | 0.005 | |

**Regression Weights: (NO - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | F1 | 0.170 | *** | W6_NO |

**Regression Weights: (LOW - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | F1 | 0.233 | *** | W6_LOW |

**Regression Weights: (HIGH - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | F1 | 0.078 | 0.050 | W6_HIGH |

This study reported a significant direct relationship between entrepreneurial self-efficacy and entrepreneurial behavior building among university students with p-value at 1% significance level (0.005). $\beta = 0.073$ demonstrates that one unit increase in entrepreneurial self-efficacy resulted in 0.073 unit increase in entrepreneurial behavior. According to Carr and Sequeira (2007), self-efficacy is positively related to entrepreneurial intent (which can be interpreted in terms of behavioral exhibition). According to van Gelderen, et al. (2015), self-control is considered an important moderator for any entrepreneurial-building relationship. Therefore in this hypothesis, moderation of self-control, whether rated as "low" or "high", is significant at 5%. Therefore, the alternative hypothesis is supported and a significant relationship between entrepreneurial behavior and education is moderated through the self-control.

**Regression Weights: (Group number 1 - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | EDS | 0.095 | *** | |

**Regression Weights: (NO - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | EDS | 0.158 | *** | W3_NO |

**Regression Weights: (HIGH - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | EDS | 0.066 | 0.047 | W3_HIGH |

**Regression Weights: (LOW - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | EDS | 0.236 | *** | W3_LOW |

According to our results, educational support has a significant relationship with entrepreneurial behavior-building of university students. Türker and Selçuk (2009) argue that the entrepreneurial knowledge and mindset of university students is dependent on educational curriculum support provided by the university. This has also been validated by our results. However, self-control was not significant in terms of the moderating effects among educational support and entrepreneurial support. There is much evidence in the literature suggesting a direct positive relationship between these two variables. Mariano et al. (2012) also proposed that educational programs shape entrepreneurial behavior-building. Therefore, the alternative hypothesis is rejected.

**Regression Weights: (Group number 1 - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | PSA | 0.012 | 0.668 | |

**Regression Weights: (no - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | PSA | 0.151 | *** | W4_no |

**Regression Weights: (low - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | PSA | 0.075 | 0.140 | W4_low |

**Regression Weights: (high - Default model)**

| | | | Estimate | P | Label |
|---|---|---|---|---|---|
| ENTB | <--- | PSA | .136 | *** | W4_high |

Yurtkoru et al. (2014) suggest a positive impact of relational support on personal attitudes building. This study also provides evidence of the mediating effect of relational support on personal attitude and entrepreneurial behavior of university students. This may be an indirect route to establish entrepreneurial behavior. Liñán and Chen (2009) propose relational support as a mediating factor on personal attitude and entrepreneurial intention. The direct relationship between entrepreneurial behavior and personal attitudes does not reach significance at a p-value of 0.668. However, if this relationship is moderated by relational support, then it is highly significant at 1% significance value. Therefore, the alternative hypothesis is supported. $\beta = 0.136$ indicate that one unit increase in personal attitudes given the moderation effect of relational support resulted in 0.136 unit increase in entrepreneurial behavior.

## 3. Summary of Research Findings

A total of 350 questionnaires were obtained from both universities. Of those, 300 questionnaires were usable. Fifty questionnaires were rejected due to missing data. 69.7% of the students in the sample from both universities acknowledged that at some point in time they considered a business setup, including an extensive feasibility study, and arrived at a point of decision. This demonstrates the environmental influence on students' considerations of the national economy in Pakistan, as well as their general preference of self-employment over a conventional job search.

54.7% of the sample that they had been involved in team management, and working as part of a team. Entrepreneurial behavior is linked to this team management, as an entrepreneur is a team player and possesses a vision to organize his/her human resources to the best of their capabilities. This item was specific to startup team management, especially preliminarily startup initiatives that young entrepreneurs frequently undertake. Presently, business plan creation is taught in practically every business school in Pakistan. 69.7% of the students in the sample reported that they had made a business plan for some reason. This illustrates the logical reasoning ability and on-paper skills necessary to develop a concrete draft for any business venture. Behavioral testing in this regard was useful as this aspect was positive among university students.

Thinking of a business name, with a focus on the general public or target markets is of prime importance in the process of becoming self-employed. 63.0% of the respondents reported that they had been involved in formulating a business name. This illustrates that young entrepreneurs tend to engage in the preliminary steps and thinking processes that make a successful entrepreneur. It also captures the relative level of interest in entrepreneurship as the mental occupation of formulating a name for a business signifies positive entrepreneurial behavior.

Saving money for business is typically difficult for university students; their source of income is minimal and saving is not a priority. Generally, students interested in starting a business after they graduate expect that investment and startup capital will be provided by relational support. Consequently, only 48.0% of the students surveyed reported having saved money for the purpose of setting up a business. There are exceptions, e.g., students who started a business after earning a bachelor's degree then returned to attain a higher degree later, or students who were already in a family business and earned personal income as they attended university This is to be expected, as the sample frame mainly comprised business school students. 51.3% of the students in the sample frame responded that they have invested money into a business at some point in time. Respondents were given clarification on this item as to investment as any monetary funding for pure business, small ventures (like school stalls in a funfair), or university projects involving a practical business plan implementation. Therefore, though the responses may seem unexpected, they were in accordance with the measured aspect.

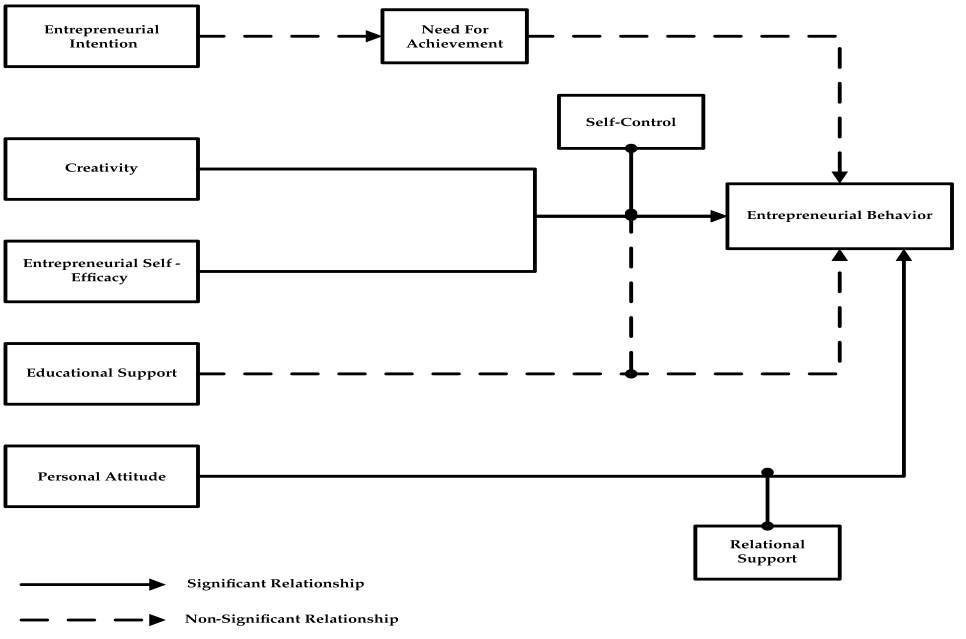
There is a significant relationship between entrepreneurial behavior and entrepreneurial intention given the mediation effect of need for achievement. The underlying issues with this proposed relationship include the direct positive relationship between entrepreneurial behavior and entrepreneurial intention that becomes less significant given the mediating effect of need for achievement. This hypothesis was rejected as need for achievement had a direct positive relationship with entrepreneurial intention and a direct positive relationship with entrepreneurial behavior but as a mediator it did not strengthen the relationship between the independent variable and the dependent variable. Need for achievement's use as mediator was not justified in this framework. (Refer to Figure 3). There is a significant relationship between entrepreneurial behavior and creativity given the moderation effect of self-control. The research results indicated that this relationship was significant as self-control proved detrimental in terms of channeling creativity for the nourishment of

entrepreneurial behavior. Creativity had a direct positive relationship with entrepreneurial behavior, but the moderating effect of self-control between these two variables was also significant and agrees with the rationale of controlled behavioral patterns (refer to Figure 3).

There is a significant relationship between entrepreneurial behavior and entrepreneurial self-efficacy given the moderating effect of self-control. Self-efficacy in entrepreneurial behavior building was significantly supported given the moderating effect of self-control. The reasoning behind this result can be traced to the logic that personal interest and entrepreneurial intent must utilize self-control so that the apt tradeoffs are made at the ideal time for maximum benefits (refer to Figure 3). There is a significant relationship between entrepreneurial behavior and educational support given the moderation effect of self-control

The direct positive impact of educational support on behavioral makeup for entrepreneurship was articulated above. The need for self-control as a moderating factor was not justified as literature exists supporting the direct relationship of entrepreneurial behavior and educational support. The relationship was proposed in this framework as an exception to the literature for the purpose of testing a probability that failed to hold true in this research (refer to Figure 3). There is a significant relationship between entrepreneurial behavior and personal attitudes given the moderation effect of relational support. Relational support is considered important for the financing of needs and possessing an attitude towards entrepreneurship alone is not enough to offset the vital role of relational support for that purpose. The moderating test was supported by the research results and relational support proved to shape entrepreneurial behavior positively (refer to Figure 3).

**Figure 2: Significant & Non Significant relationship of Entrepreneurial Behavior with Related factors**




## 4. Discussion and Implications

The purpose of this study was to segment and analyze the probable factors that lead to an increase in entrepreneurial behavior among universities students. The main implication is that these young entrepreneurs have a lot of potential to contribute to the economy and national exchequer of Pakistan in the years to come through small and medium sized business ventures. This study intends to be an instrument available for use by educationists and academic policy-makers to encourage investment of time and money, to prepare young entrepreneurs for their futures. The detailed discussion to follow provides step-by-step evidence for all the relationship tests conducted in this study. This will provide further insights about important implications for governmental policy-makers and potential investors.

Entrepreneurial behavior is directed by factors such as intention, self-efficacy, creativity, and attitudes. These psychological factors have been given considerable discussion in the literature as well. The aim of this study is to match the closest derived implications from the existing literature and modern research to formulate a new theory for studying the entrepreneurial behavior of university students.

### *4.1. Implications for Managerial Educators and Policy-Makers*

This research was conducted with the purpose of identifying the factors that shape behavior of students in favor of entrepreneurship. The significant benefit of such behavior has long-lasting implications in terms of the opportunity landscape that might emerge as a result. Pakistan is considered by many to be a land of opportunities. Taking this view forward, the managerial educators that devise, design, and implement curriculum in universities, schools, and colleges must be made aware of the countless benefits that young entrepreneurs can bring to the national GDP and exchequer. However, this preparation should not be confined to business and commerce students only. Students from all disciplines should be provided with basic training and clear concepts about entrepreneurship.

The research concluded that entrepreneurial behavior is brought about by the fostering of basic intention, self-efficacy, educational support, creativity in thinking, and personal attitude towards entrepreneurial activities. Therefore, it is important for teachers, scholars, and writers of managerial sciences to promote the significance of each of these components among young students, especially at the university level. Regular workshops discussing the findings of new research in student entrepreneurship must be conducted among university students so they may be well-equipped and aware of the latest national and international entrepreneurial landscape. This would necessitate a major opportunity cost analysis, and students could make an informed choice between self-employment and a conventional job search. As careful analysis of the useful concepts in the existing literature was the intention of this research, so too should managerial educators follow suit, utilizing existing and current research to create a modern entrepreneurial curriculum. Awareness about entrepreneurial success stories over time should also form part of curriculum.

Policy-makers include government bodies, universities' board of directors, and publication associations. Their action on policy matters dictates general public behavior and reactions. In Pakistan, the Prime Minister's recent funding for small-scale business setups should be considered a substantial step towards promoting young entrepreneurship across the country. Government at each level needs to annually allocate funds for this type of education as student entrepreneurship has become a global phenomenon. Funding should also be made available for practical implementation of business plans made by university students still in the process of completing their degree. Local, provincial, and federal

governments need to work in collaboration with major universities to create appropriate curricula for entrepreneurship education and support entrepreneurial behavior by opening vocational centers at university campuses. This holistic solution creates awareness for student entrepreneurship across the country until such a time that a multiplier effect is present.

Universities should sponsor and host business plan competitions within and between various universities, and award funds for the best-ranked plans. Sponsorships and endorsements must be acquired from major corporate organizations like banks to promote the culture of student entrepreneurship. Publications bodies should be encouraged to hold seminars, include articles, and report on presentations on entrepreneurship. This would have the effect of introducing novel literature and fresh perspectives on student entrepreneurship. New theories of planned behavior and attitudes testing must be a prominent part of the call for journal papers every year. National events must be held to generalize entrepreneurship among the public at large. Each of these propositions has the prime intent of promoting and nourishing student entrepreneurship, as our country continues to lag behind other countries in this area. Those nations made the sacrifices necessary to achieve what they have. This research aims to increase economic and social development of Pakistan.

### *4.2. Recommendations for Future Research*

This study has provided important findings on and the implications of student entrepreneurship. Based on the discussions so far presented, concluding recommendations for future research are proposedThe mediating role of need for achievement should form part of future research initiatives, as this factor has been tested extensively directly in relation to entrepreneurial intention and behavior, but its mediating effect must be better understood and measured through the devising of new research scales and analytical models.

Self-control as a moderator has not yet been tested with self-efficacy and creativity variables impacting entrepreneurial behavior, in particular. Scope currently exists in the literature to define levels of self-control and their relative impact on the behavior of university students. (Moderation models are rare in the literature.)Personal attitudes break down into specific components, such as emotions, aptitude, introversion, and extroversion, must form part of future studies to better investigate the impact of a student's general attitude on behavioral outcomes. This is

significant as previous research studies provide a holistic view of personal attitude, rather than its component parts.

Relational support is an important determinant of entrepreneurial behavior, and it can have an important moderating impact on the relationship between various factors and entrepreneurial behavior. Therefore, relational support must be separated further into family support and acquaintances support in order to analyze in detail how important relationship-building is for complementing entrepreneurial initiatives. Diversity in independent variables selection is not readily evident in existing literature. Vast scope exists that can be exploited to formulate a diverse range of independent variables effecting overall entrepreneurial behavior of university students.

A limitation of this study was that the ratio of male and female participants in the survey result was not equal. This was out of the scope of this specific study, but future research on this theme should incorporate the significant area of gender study, as well.

Socio-economic factors are not well represented in the existing literature, as there are no studies examining students' responses from lower- and higher-end universities (e.g., those in remote areas, those in city centers, etc.). Comparison studies must be conducted to analyze the variation of behavior across certain segments of students in various cities, as well as areas within Pakistan and outside the country.

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## *Appendix*

### Research Questionnaire

Please use the given rating scale to indicate the extent to which you agree with the following statements.

| **ENTREPRENEURIAL INTENTION** | **Strongly Disagree** | **Disagree** | **Neutral** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| I am determined to create a firm in the future. | **1** | **2** | **3** | **4** | **5** |
| I have very seriously thought of starting a firm. | **1** | **2** | **3** | **4** | **5** |
| I am determined to create a firm in the future. | **1** | **2** | **3** | **4** | **5** |
| I will make every effort to start and run my own firm. | **1** | **2** | **3** | **4** | **5** |
| **SELF CONTROL** | | | | | |
| It is difficult for me to get rid of bad habits | **1** | **2** | **3** | **4** | **5** |
| Pleasant and fun things sometimes prevent me from getting work done | **1** | **2** | **3** | **4** | **5** |
| I have difficulties concentrating | **1** | **2** | **3** | **4** | **5** |
| Sometimes I cannot prevent myself doing things I know are wrong | **1** | **2** | **3** | **4** | **5** |
| **RELATIONAL SUPPORT** | | | | | |
| If I decided to be an entrepreneur, my close network (from work, school, and neighborhood) supports me. | **1** | **2** | **3** | **4** | **5** |
| If I decided to be an entrepreneur, my friends support me. | **1** | **2** | **3** | **4** | **5** |
| If I decided to be an entrepreneur, my family members support me. | 1 | 2 | 3 | 4 | 5 |
| | Please use the given rating scale to indicate the extent to which you agree with the following statements. | | | | |

| **PERSONAL ATTITUDE** | **Strongly Disagree** | **Disagree** | **Neutral** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| Being an entrepreneur would entail great satisfactions for me. | 1 | 2 | 3 | 4 | 5 |
| Among various options, I would rather be an entrepreneur. | 1 | 2 | 3 | 4 | 5 |
| Being an entrepreneur implies more advantages than disadvantages to me. | 1 | 2 | 3 | 4 | 5 |
| If I had the opportunity and resources, I'd like to start a firm. | 1 | 2 | 3 | 4 | 5 |
| **CREATIVITY** | | | | | |
| Other people think that I'm always making changes and trying out new ideas. | 1 | 2 | 3 | 4 | 5 |
| Sometimes people find my ideas unusual. | 1 | 2 | 3 | 4 | 5 |
| Sometimes I have so many ideas that I feel pressurized. | 1 | 2 | 3 | 4 | 5 |
| At work, I often take over projects and steer them my way without worrying about what other people think. | 1 | 2 | 3 | 4 | 5 |
| If I had a good idea for making some money, I would be willing to invest my time and borrow money to enable me to do it. | 1 | 2 | 3 | 4 | 5 |

Please use the given rating scale to indicate the extent to which you agree with the following statements.

| **NEED FOR ACHIEVEMENT** | **Strongly Disagree** | **Disagree** | **Neutral** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| Hard work is something I like to avoid | 1 | 2 | 3 | 4 | 5 |
| I believe I would enjoy having authority over other people | 1 | 2 | 3 | 4 | 5 |
| I would like an important job where people would look up to me | 1 | 2 | 3 | 4 | 5 |

| **EDUCATIONAL SUPPORT** | | | | | |
|---|---|---|---|---|---|
| The education in university encourages me to develop creative ideas for being an entrepreneur. | 1 | 2 | 3 | 4 | 5 |
| My university develops my entrepreneurial skills and abilities. | 1 | 2 | 3 | 4 | 5 |
| My university provides the necessary knowledge about entrepreneurship. | 1 | 2 | 3 | 4 | 5 |
| **Please use the "Yes" & "No" Options to indicate the extent to which you agree with the following statements.** | | | | | |
| Spent a lot of time thinking about starting a business? | | | YES | | NO |
| Organized a start-up team? | | | YES | | NO |
| Prepared a business plan? | | | YES | | NO |
| Selected a business name? | | | YES | | NO |
| Saved money to invest in a business? | | | YES | | NO |
| Invested your own money in a business? | | | YES | | NO |
| **Please use the given rating scale to indicate the extent to which you are confident about the following statements.** | **Very little confidence** | **Some Confidence** | **Neutral** | **Confident** | **complete confidence** |
| Work long hours in my business | 1 | 2 | 3 | 4 | 5 |
| Save or personally accumulate the necessary capital to fund my business | 1 | 2 | 3 | 4 | 5 |
| Recognize a business opportunity before others do | 1 | 2 | 3 | 4 | 5 |
| Prepare projected (pro-forma) financial statements (e.g. balance sheets) without assistance | 1 | 2 | 3 | 4 | 5 |
| Identify the need for a new product or service | 1 | 2 | 3 | 4 | 5 |
| Get others to identify with and believe in my vision & plans for a new business | 1 | 2 | 3 | 4 | 5 |

**Table 1 Findings of Research on Student Entrepreneurship in Pakistan**

| Student Entrepreneurship | Variables Studied | Results | Sample Size | Sector/City | Author |
|---|---|---|---|---|---|
| 1) Dimension: Family Background & Career Selection | Personal Attitude, Social Norms, Perceived Behavioral control, Entrepreneurship Education and Entrepreneurial Intention | Personal attitudes and behavioral control significantly impact entrepreneurial intention. | 150 Pakistani university Students | Pakistan | Aslam et al. (2012) |
| 2)Dimension: Intention of Business Graduate and Undergraduate to be an entrepreneur | Family background, gender, education and role of university | Graduates have a clear intention for job as compared to self-employment | 114 students of The Islamia University of Bahawalpur | Bahawalpur | Tanveer et al. 2013 |
| 3)Dimension: Barriers for Business Students in Becoming an Entrepreneur | Subjective Norms & entrepreneurial intention | Weak financial resources & weak economic conditions discourage entrepreneurial intentions | 114 students of The Islamia University of Bahawalpur | Bahawalpur | Tanveer et al. 2011 |
| 4)Dimension: Low inclination towards entrepreneurship of business students of Islamabad | Support, Risk tolerance, innovation & intention | Entrepreneurial orientation is very low among the business students due to lack of interest | 20 students each from various universities | Islamabad | Sial and Chudry (2011) |
| 5)Dimension: Entrepreneurship Education among Pakistani University Students | self-control, creativity and subjective norms & Intention | Entrepreneurial intention is significantly driven by underlining factors like self-control and subjective norms | 805 undergraduate students in universities in Pakistan | Pakistan | Saeed et al. (2014) |

**Table 2: Instrument Description**

| Instrument | Creators | Year | No. Of Items |
|---|---|---|---|
| **Entrepreneurial Intention** | Yurtkoru et al. | 2014 | 4 |
| **Self- Control** | Van Gelderen et al. | 2015 | 4 |
| **Relational Support** | Yurtkoru et al. | 2014 | 3 |
| **Personal Attitude** | Yurtkoru et al. | 2014 | 4 |
| **Entrepreneurial Behavior** | Rauch & Hulsink | 2015 | 6 |
| **Entrepreneurial self-efficacy** | Carr & Sequeira | 2007 | 6 |
| **Creativity** | Ishiguro | 2015 | 5 |
| **Need for achievement** | Carter et al. | 2003 | 3 |
| **Educational Support** | Yurtkoru et al. | 2014 | 3 |

**Table 3: Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| Entrepreneurial Intention | 3.6683 | .98313 | 300 |
| Self-Control | 3.0258 | .79791 | 300 |
| Relational Support | 3.7788 | .70361 | 300 |
| Personal Attitudes | 3.8333 | .68894 | 300 |
| Creativity | 3.5473 | .58501 | 300 |
| Need for achievement | 3.4020 | .70880 | 300 |
| Educational Support | 3.8121 | .79119 | 300 |
| Entrepreneurial Self Efficacy | 3.6023 | .69843 | 300 |

## Table 4: Correlations

| | | ENTINT | SC | RS | PA | CRET | NFACH | ES | EB | ENTSF |
|---|---|---|---|---|---|---|---|---|---|---|
| ENTINT | Pearson Correlation | 1 | -.072 | .333** | .549** | .417** | .117* | .302** | .405** | .499** |
| SC | Pearson Correlation | -.072 | 1 | -.023 | .035 | -.019 | .239** | -.173** | -.258** | -.064 |
| RS | Pearson Correlation | .333** | -.023 | 1 | .509** | .348** | .158** | .371** | .313** | .317** |
| PA | Pearson Correlation | .549** | .035 | .509** | 1 | .437** | .201** | .319** | .307** | .407** |
| CRET | Pearson Correlation | .417** | -.019 | .348** | .437** | 1 | .259** | .294** | .371** | .322** |
| NFACH | Pearson Correlation | .117* | .239** | .158** | .201** | .259** | 1 | .166** | .088 | .206** |
| ES | Pearson Correlation | .302** | -.173** | .371** | .319** | .294** | .166** | 1 | .310** | .265** |
| EB | Pearson Correlation | .405** | -.258** | .313** | .307** | .371** | .088 | .310** | 1 | .362** |
| ENTSF | Pearson Correlation | .499** | -.064 | .317** | .407** | .322** | .206** | .265** | .362** | 1 |

**. Correlation is significant at the 0.01 level (1-tailed).

*. Correlation is significant at the 0.05 level (1-tailed).

## Table 5: Confirmatory Factor Analysis Table

| Variables | Factor Loading Range | CR | AVE | DV |
|---|---|---|---|---|
| Entrepreneurial Self Efficacy | 0.54 – 0.76 | 0.838 | 0.466 | 0.683 |
| Entrepreneurial Intention | 0.75 – 0.92 | 0.923 | 0.752 | 0.867 |
| Personal Attitudes | 0.62 – 0.85 | 0.827 | 0.548 | 0.740 |
| Educational Support | 0.63 – 0.83 | 0.743 | 0.495 | 0.703 |
| Self-Control | 0.44 – 0.79 | 0.744 | 0.430 | 0.656 |
| Creativity | 0.52 – 0.62 | 0.643 | 0.312 | 0.558 |
| Relational Support | 0.48 – 0.79 | 0.714 | 0.464 | 0.681 |
| Need for Ach | 0.60 – 0.72 | 0.606 | 0.436 | 0.661 |
| Entrepreneurial Behavior | 0.52 – 0.74 | 0.839 | 0.468 | 0.684 |

**Table 6: Factor Loading**

| Variables | Composite Reliability (AMOS) | Construct reliability (SPSS - Cronbach's Alpha (α) ) |
|---|---|---|
| Entrepreneurial Self Efficacy | 0.838 | 0.833 |
| Entrepreneurial Intention | 0.923 | 0.921 |
| Personal Attitudes | 0.827 | 0.820 |
| Educational Support | 0.743 | 0.822 |
| Self-Control | 0.744 | 0.735 |
| Creativity | 0.643 | 0.666 |
| Relational Support | 0.714 | 0.696 |
| Need for Achievement | 0.606 | 0.600 |
| Entrepreneurial Behavior | 0.839 | 0.837 |

**Table 7 Test of Reliability (A)**

| Questionnaire ITEMS | Factor Loading (This Research) | Factor Loading (In Literature) |
|---|---|---|
| I am determined to create a firm in the future. | 0.92 | 0.94 (Yurtkoru et al. 2014) |
| I have very seriously thought of starting a firm. | 0.87 | 0.92 (Yurtkoru et al. 2014) |
| I am determined to create a firm in the future. | 0.91 | 0.92 (Yurtkoru et al. 2014) |
| I will make every effort to start and run my own firm. | 0.75 | 0.88 (Yurtkoru et al. 2014) |
| If I decided to be an entrepreneur, my close network (from work, school, and neighborhood) supports me. | 0.48 | 0.88 (Yurtkoru et al. 2014) |
| If I decided to be an entrepreneur, my friends support me. | 0.71 | 0.82 (Yurtkoru et al. 2014) |
| If I decided to be an entrepreneur, my family members support me. | 0.79 | 0.87 (Yurtkoru et al. 2014) |
| Being an entrepreneur would entail great satisfactions for me. | 0.71 | 0.88 (Yurtkoru et al. 2014) |
| Among various options, I would rather be an entrepreneur. | 0.85 | 0.85 (Yurtkoru et al. 2014) |
| Being an entrepreneur implies more advantages than disadvantages to me. | 0.76 | 0.81 (Yurtkoru et al. 2014) |
| If I had the opportunity and resources, I'd like to start a firm. | 0.62 | 0.78 (Yurtkoru et al. 2014) |
| The education in university encourages me to develop creative ideas for being an entrepreneur. | 0.83 | 0.90 (Yurtkoru et al. 2014) |
| My university develops my entrepreneurial skills and abilities. | 0.62 | 0.89 (Yurtkoru et al. 2014) |
| My university provides the necessary knowledge about entrepreneurship. | 0.64 | 0.87 (Yurtkoru et al. 2014) |

**Table 8: Test of Reliability (B)**

| Variables | Reliability in Literature (as per anchor articles) |
|---|---|
| Entrepreneurial Self Efficacy | 0.960 |
| Entrepreneurial Intention | 0.940 |
| Personal Attitudes | 0.900 |
| Educational Support | 0.910 |
| Self-Control | 0.820 |
| Creativity | 0.700 |
| Relational Support | 0.780 |
| Need for Achievement | 0.650 |
| Entrepreneurial Behavior | 0.920 |

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# Relationship between Service Quality, Customer Loyalty and Customer Satisfaction

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**Abstract**

*This study examined the influence of service quality on customer loyalty, and aimed to determine if this relationship was mediated by customer satisfaction. Data were gathered from customers of eight banks in Pakistan through an adapted self-administered questionnaire. Respondents were selected using convenience sampling. The distributed questionnaire was based on a modified SERVQUAL model.479 complete survey responses were returned out of a total of 700 distributed. The completed questionnaires were examined through descriptive statistics, regression analysis, and PROCESS technique (Hayes2013). Results revealed a significant effect of service quality on customer loyalty. Customer satisfaction was found to have a significant mediating effect on the relationship between service quality and customer loyalty. The outcomes of our study could be useful for policy-making in bank management, and future banking expansion. There is additional generalized benefit to having insight into customers' thinking regarding the banking sector.*

**Keywords**: SERVQUAL, service quality, customer satisfaction, technology, customer loyalty

**JEL Classification:** M19.

## 1. Introduction

In most developed countries, the service sector, which includes the banking industry, plays an imperative role in economic growth and prosperity (Ostrom et al., 2010). Likewise, in Pakistan, banks are an important tool for economic development; these financial institutions are continuously expanding and offering a wide range of financial services, investment opportunities within and outside the country leading to

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further economic growth (Khalid & Irshad, 2010). However, product quality is equally important for customer satisfaction. Customers have become more knowledgeable of required standards of quality and demand sufficient services. This is why, in order to achieve success, it is a necessity for every business to provide high quality services (Lee & Lin, 2005). Service providers should also maintain a good relationship with their customers (Panda, 2003) as these relationships define customer satisfaction and loyalty with the organization (Joseph et al., 2005).

Numerous researchers have stated that service quality provided by an organization impacts its performance (Portela & Thanassoulis, 2005), market share (Fisher, 2001), sales profit, (Duncan &Elliot, 2002) and customer loyalty (Ehigie, 2006). Caruana (2002) has provided evidence that loyalty, satisfaction of customers, and quality of service are interrelated. Furthermore, emergence of technology in the service sector has increased customer expectation of service providers (Al-Eisa and Alhemoud, 2009). Thus, usage of adequate technology to deliver quality products to customers, and maintaining healthy links with customers is as important as any other feature for the survival of companies. Although literature is available on the topic of service quality, there still exists a gap in the research. Neither the direct effect of service quality on customer loyalty, nor the indirect effect via mediators has been fully explored within the framework of a developing country such as Pakistan.

Within the perspective of new age technology used in the banking industry in Pakistan, our research has two objectives. The primary aim is the prediction customer loyalty by service quality. Secondarily, it examines the mediation of customer satisfaction in quality of services and loyalty. Furthermore, according to disconfirmation theory of satisfaction (Oliver, 1977; 1980), a good business wants its customers neither dissatisfied nor delighted, but rather always satisfied. It is hard to provide banks with a single solution for customer satisfaction, but it is important that managers know where their customers stand on the three satisfaction levels, or stages: dissatisfaction stage, satisfaction stage, and delighted stage. They should also be aware of their competitors' challenges. This research provides an addition in the literature of services marketing and will help bank managers to understand their customers in an effective manner, set their strategies to compete in the market, and meet the expectations of customers in a developing country like Pakistan.

## 2. Review of Literature

### *2.1. Service Quality*

It is imperative for banks to plan their strategies in such a way that they can be competitive in a crowded market. This can be achieved if banks concentrate on high-quality service and an effective delivery process, as high-quality service increases satisfaction level among customers, further developing customer loyalty (Caruana, 2002). A service is defined as an offered, intangible performance (Kotler & Keller, 2006). A service has various characteristics: incorporeal in nature, cannot be measured by any physical instrument, components are inseparable, and is variable as it cannot be the delivered in the same manner at different time periods (Ograjenšek, 2008).

Parasuraman et al (1988) have suggested different items to measure the quality of services. A few alterations have been made to this scale over time, and the measurement tool is known today as SERVQUAL. Its five dimensions are listed here:

1) Tangibles – Equipment and other components of physical existence.
2) Reliability – Delivery of committed services.
3) Responsiveness – Interest in customers' problems and quick delivery of services.
4) Assurance – Perception of courtesy, security, and guarantee of competence provided by employees.
5) Empathy – How firms and their employees demonstrate understanding of customers' needs.

### *2.2. Customer Satisfaction*

Customer satisfaction develops when a customer compares the received value of a service to their expectations (Kotler et al., 2009). It is the overall judgment of a customer of any good or service (Woodruff, 1997), which helps (or hinders) service providers in maintaining strong relationships with their customers. Service quality is associated with customer satisfaction (Cronin et al., 2000), which is achieved when firms meet customers' needs and provide services that meet market standards (Gitomer, 1998). Customer satisfaction is significantly affected by service quality (Muyeed, 2012).

### *2.3. Customer Loyalty*

Customer loyalty manifest when customers are motivated to repurchase the service or product, or try to convince others to purchase the same service or product (Heskett et al., 1994). According to Duffy (2003), customer loyalty is a customer's emotional attachment to a brand. These emotional attachments leads the customers to purchase a brand repeatedly; as a result, firms receive financial benefit from loyal customers. Generally, banks aim to maximize profits, expand their business, and position themselves favorably among their competitors. Customer loyalty is a tool to aid with profit seeking, positioning, and expansion of goals (Hayes, 2008). Anderson & Mittal (2000) confirmed the strong association of quality of services and customers' loyalty and this association was also confirmed by other studies (Oliva et al., 1992; Bloemer & De Ruyter, 1999).

### *2.4. Tangibility*

A combination of both incorporeal and tangible features of services/products quality can play a vital role in developing long haul association of banks and their valuable customers, and can increase the likelihood of customer retention (Zineldin, 2005). Organizations generally want their consumers to view them positively. This goal can be fulfilled more effectively if firms focus on the tangibility of their provided services (Swar & Sahoo, 2012), which serves to garner the attention of customers (Ladhari et al., 2011). Similarly, banks can acquire the loyalty of their customers by providing the best tangible facilities (Jabnoun and Al-Tamimi, 2003). Disconfirmation theory (Oliver, 1977; 1980) postulates that tangibility is a dimension of service quality which facilitates the provision of better products and services to customers; based upon this, customers compare their expectations and perceptions related to the tangibility dimension of services. The difference between their expectations and their perceptions further affects satisfaction, which is followed by their loyalty. We posit that the tangibility dimension of service quality has a vital part to play in establishing satisfaction and loyalty. Therefore, hypotheses related to tangibility are:

**H1:** Tangibility is positively associated with customer satisfaction.

**H2:** Tangibility is positively linked to customer loyalty.

### *2.5. Reliability*

Ibáñezet al. (2006) have confirmed the significant association between reliability of services and satisfaction from these services. It is also observed in the literature that the relationship between customer satisfaction and service reliability becomes stronger when employees deal directly with customers (Muyeed, 2012). Similarly, a study of the banking sector in Malaysia found that reliability leads to develop loyal customers (Sureshchandar et al., 2003) and it is also have confirmed by Brown and Mitchell (1993). Disconfirmation theory (Oliver, 1977;1980) provides support for these studies and proposes that reliability of services helps the customers make comparisons between their perception of the firms' products/services and their expectations of those products/services. Satisfaction with services further creates loyalty with that firm. Therefore, the third and fourth hypotheses of this research are:

**H3:** Reliability is positively associated with customer satisfaction

**H4:** Reliability is positively linked to customer loyalty.

### *2.6. Responsiveness*

In line with the disconfirmation theory presented by Oliver (1977;1980), numerous studies suggest that responsiveness positively affects customer satisfaction (Parasuraman et al., 1988; Sigala et al., 2006; Joseph et al., 2005). Customers respond positively when firm services meet their expectations (Diaz & Ruiz, 2002). The positive alignment of expectations and perceptions results in customer satisfaction and eventually their loyalty. Likewise, responsiveness is utilized as a tool in creation of satisfaction and loyalty in customers (Glaveli et al., 2006). Responsiveness not only aids in developing loyalty in customers, but it builds long-term relationships with them (Ndubisi, 2006). Thus, the fifth and sixth hypotheses of our study are as follows:

**H5:** Responsiveness is positively associated with customer satisfaction.

**H6:** Responsiveness is positively linked to customer loyalty.

### *2.7. Assurance*

As discussed above, service quality is constructed of three main pillars (reliability, responsiveness and tangibility) which significantly influence customer satisfaction (Parasuraman et al., 1988). Ndubisi (2006)

confirmed that trustworthy employee behavior also leads to greater customer satisfaction. Bitner (1990) observed that loyalty of customers is strongly affected by the assurance about services. Muyeed (2012) argued that the loyalty of customers and assurance about services are more strongly associated than the other dimensions of service quality. Moreover, as described by disconfirmation theory (Oliver, 1977; 1980), the customers analyze whether or not the perceived service feature, such as assurance from employees, is consistent with customers' expectations. When customers feel that assurance received from the employees meets their expectations, they are satisfied, and consequently develop loyalty. Hence, the seventh and eighth hypotheses of this research are:

**H7:** Assurance is positively associated with customer satisfaction.

**H8:** Assurance is positively linked to customer loyalty.

### *2.8. Empathy*

According to Iglesias & Guillen (2004), customer satisfaction is greatly driven by empathy. Al-Marri et al. (2007) have also confirmed the link between empathy and customer satisfaction; they have verified that empathy serves as a tool to create long-term relationships between firm and customers. According to disconfirmation theory (Oliver, 1977; 1980), this occurs when customers find that firm employees provide individualized support and personal attention; customers' expectations are fulfilled and they become satisfied, improving the likelihood of becoming loyal to the firm. Similar results were presented by Jabnoun & Al-Tamimi (2003), stating that in any service sector, customers cannot be loyal with the firm until and unless individual attention is given to the customers. Organizations can maintain a large customer base by providing each of them individual attention (Ford et al., 2005).With this in mind, the ninth and tenth hypotheses of our study are:

**H9:** Empathy is positively related with customer satisfaction.

**H10:** Empathy is positively associated with customer loyalty.

### *2.9. Technology*

Developed technologies improve services and enhance the satisfaction of customers, ultimately leading to loyalty of customers (Surjadjaja et al., 2003). As discussed above, disconfirmation theory (Oliver, 1977; 1980) states that customers compare their expectation level

with the delivery of service and develop their satisfaction or dissatisfaction based on the extent to which their perception of service quality matches their expectations; this satisfaction further establishes loyalty towards the firm. Technology can improve the delivery of services, making the customers delightful, and as a result they become loyal with the organization (Rafaeli et al., 2008). Therefore, the following eleventh and twelfth hypotheses have been developed:

**H11:** Technology is positively related with customer satisfaction.

**H12:** Technology is positively related with customer loyalty.

### *2.10. Association of Satisfaction and Loyalty of Customers*

Customer satisfaction has a positive relationship with customer loyalty (Brimpong, 2008), as it ensures the retention of customers (Mosahab, et al., 2010). Muhammad et al. (2011) explained that loyalty of customers is significantly predicted by their satisfaction and the association of these factors is strong (Kumar et al., 2010). Correspondingly, the thirteenth hypothesis is:

**H13:** Customer satisfaction predicts customer loyalty positively.

### *2.11. Mediation of Customers' Satisfaction*

The mediation by customers' satisfaction was purported in the disconfirmation theory proposed by Oliver (1977; 1980) in the relationship between service quality and customer loyalty. According to this theory, individuals face positive disconfirmation when the services they receive exceed their expectations, and customer satisfaction is high. Similarly, individuals face negative disconfirmation when the services they receive are below expectation, and as a result, their satisfaction with the service is low. The literature provides support for the idea that customer satisfaction derived by service quality can mediate the effect of service quality on customer loyalty. For instance, it was suggested that in the Bangladeshi telecommunication industry the association of quality and loyalty for services is significantly mediated by the satisfaction of their customers (Akbar & Parvez, 2009). Likewise, Ismail et al. (2006) reported that the impact of reliability (a dimension of service quality) on customer loyalty is partially mediated by customer satisfaction in a Malaysian context. Kheng et al. (2010) found a strong mediating effect of satisfaction between the dimensions of services quality and loyalty of

customers in the banking sector. Kumar et al. (2010) reported that customer loyalty is indirectly affected by service quality through customer satisfaction. Additionally, a partial mediation was found in relation of quality and loyalty by satisfaction is services' context (Osman and Sentosa, 2014). Considering these studies, we develop the remaining hypotheses in this way:

**H14 (a):** Association of tangibility and loyalty of customers is positively and significantly mediated by customers' satisfaction.

**H14 (b):** Association of reliability and loyalty of customers is positively and significantly mediated by customers' satisfaction.

**H14 (c):** Association of responsiveness and loyalty of customers is positively and significantly mediated by customers' satisfaction.

**H14 (d):** Association of assurance and loyalty of customers is positively and significantly mediated by customers' satisfaction.

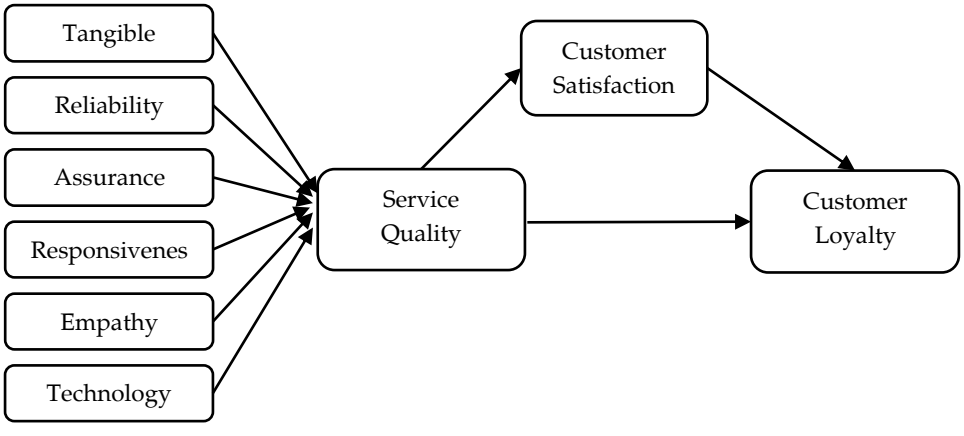
**H14 (e):** Association of empathy and loyalty of customers is positively and significantly mediated by customers' satisfaction.

**H14 (f):** Association of technology and loyalty of customers is positively and significantly mediated by customers' satisfaction.

### *2.12. Theoretical Framework*

The theoretical framework for this study has been adapted from multiple studies (Parasuraman et al., 1988; Agus et al., 2007; Harridge-March et al., 2008; Ganguli & Roy, 2011). It is presented in Figure 1.

**Figure 1: Service Quality, Customer Satisfaction, and Customer Loyalty**



## 3. Method

### *3.1. Sample and Procedure*

The aim of this study was to examine the influence of service quality on the development of customer loyalty, and the mediating effect of customer satisfaction on this relationship. To accomplish this, convenience sampling was employed, where data were collected from eight top-rated Pakistani banks, through self-administered questionnaires. In keeping with ethical considerations, respondents were contacted with the permission of the banks' management, and informants were invited to participate of their own will. To avoid bias, all questionnaires were enclosed with a cover letter which assured bank clients of anonymity during analysis and reporting. Data were collected within approximately 1 month. Out of total 700 distributed questionnaires, 479 responses were completed and returned.

### *3.2. Measurements*

A five-point Likert scale ranging from 1 = "Strongly disagree" to 5 = "Strongly agree" was used to measure all the questionnaire items. The survey questionnaire comprised 33 items and was divided into four parts. The first part included six dimensions of service quality, five of which were adapted from previous studies (Parasuraman et al., 1988; Wong et al., 2008), and a new dimension, Technology, added to the theoretical framework (Ganguli and Roy, 2011). The second and third parts of the questionnaire, adapted from Mohsan et al. (2011), were related to customer satisfaction and customer loyalty respectively. The final part of questionnaire collected demographic information from respondents.

## 4. Results

Prior to hypotheses testing, the data were checked for autocorrelation, multi-collinearity, linearity, heteroskedasticity, normality, and outliers. Results confirmed that the data were linear, normally distributed, and free of multi-collinearity issues, heteroskedasticity, and outliers, which could alter the results of the regression. Next, the instrument was checked for validity and reliability: Cronbach's alpha coefficients were computed for internal consistency of all variables used in research questionnaire. Cronbach's alpha values are given as follow: tangibility ($\alpha = .71$), reliability ($\alpha = .74$), responsiveness ($\alpha = .70$), assurance ($\alpha = .76$), empathy ($\alpha = .80$), technology ($\alpha = .78$), customer satisfaction ($\alpha = .78$), and customer loyalty ($\alpha = .82$). These values were found to be

satisfactory, as the threshold point of Cronbach's alpha is considered as .70 (DeVellis, 2003; 2012). All values in our study exceeded this threshold, demonstrating that all items have high internal consistency.

### *4.1. Respondents Profile*

As stated earlier, the final part of the questionnaire collected demographic information (age, gender, qualification, and occupation). Table 1 depicts details of respondent demographic characteristics. Respondent data show that most of the sampled individual customers of banks are male undergraduate students aged between 18 and 27 years.

**Table 1: Respondents Profile**

| Variables | | Frequency (N = 479) | Percentage (N= 479) |
|---|---|---|---|
| **Gender** | Male | 301.0 | 62.8 |
| | Female | 178.0 | 37.2 |
| **Age** | 18-27 | 335.0 | 69.9 |
| | 28-37 | 66.0 | 13.8 |
| | 38-47 | 26.0 | 5.4 |
| | 48-55 | 28.0 | 5.8 |
| | More than 55 | 24.0 | 5.0 |
| **Education** | Undergraduate | 177.0 | 37.0 |
| | Graduate | 105.0 | 21.9 |
| | Post graduate | 194.0 | 40.5 |
| | Others | 3.0 | 0.6 |
| **Occupation** | Salaried | 185.0 | 38.6 |
| | Self employed | 24.0 | 5.0 |
| | Student | 268.0 | 55.9 |
| | Others | 2.0 | 0.4 |

### *4.2. Descriptive Analysis*

Descriptive statistics are presented in Table 2.

**Table 2: Descriptive Statistics**

| Variable | Mean | St Deviation | Variance |
|---|---|---|---|
| Tangibility | 3.3933 | 0.71042 | 0.505 |
| Reliability | 3.8544 | 0.72631 | 0.528 |
| Responsiveness | 3.7655 | 0.80067 | 0.641 |
| Assurance | 3.8773 | 0.81724 | 0.668 |
| Empathy | 3.8075 | 0.76401 | 0.584 |
| Technology | 3.9118 | 0.77329 | 0.598 |
| Customer satisfaction | 3.8030 | 0.68337 | 0.467 |
| Customer loyalty | 3.8058 | 0.81941 | 0.671 |
| **N= 479** | | | |

### *4.3. Hypotheses Testing*

#### 4.3.1. Impact of service quality on customer satisfaction and loyalty

The hypothesized direct relationships in the theoretical framework have been tested through regression analysis and the results of all proposed relationships are provided in Table 3. Overall, the regression statistics depict that all dimensions of service quality have a significant positive and moderate to strong impact on customer satisfaction and loyalty. These results provide strong evidence in favor of H1 through H13. For instance, empathy is shown to have strong positive influence on customer satisfaction ($r$=0.72, $p$<.05).Technology has a moderate impact on customer satisfaction ($r$= 0.640, $p$<.05) and on customer loyalty ($r$= .59, $p$<.05).

Reliability has a relatively greater effect on customer loyalty. The tested hypotheses state that if quality of service is high for each dimension incorporated in the service by a bank's employees in Pakistan, then consumer satisfaction with that specific bank will be high. Similarly, when service quality provided by bank employees is enhanced, the customers are more loyal. Thus, hypotheses H1 to H12 are accepted at a significant level ($p$<.00).

#### 4.3.2. Effect of satisfaction of customers on loyalty of customers

Before testing the data for a mediating effect of customer satisfaction, we analyzed its direct impact on customer loyalty. Regression results are given in Table 3, showing that customer satisfaction with service is a significant predictor of customer loyalty ($r$ = .78, $p$< .01). It can be deduced that when customers find banking service satisfactory, they also tend to engage those services again. Repeated engagement is likely due to the loyalty that a customer may develop for a specific product or service. Therefore, H13 (customer satisfaction affects customer loyalty positively and significantly) is accepted.

**Table 3: Direct effects**

| Relationship (Direct effects) | Co-efficient | S.E | Sig | Hypotheses support |
|---|---|---|---|---|
| H1:Tangibility→customer satisfaction | 0.694 | 0.127 | 0.000 | Yes |
| H2:Tangibility →customer loyalty | 0.608 | 0.042 | 0.000 | Yes |
| H3:Reliability→customer satisfaction | 0.681 | 0.032 | 0.000 | Yes |
| H4:Reliability →customer loyalty | 0.651 | 0.039 | 0.000 | Yes |
| H5:Responsiveness→customer satisfaction | 0.657 | 0.030 | 0.000 | Yes |
| H6:Responsiveness→customer loyalty | 0.622 | 0.037 | 0.000 | Yes |
| H7:Assurance→customer satisfaction | 0.697 | 0.027 | 0.000 | Yes |
| H8:Assurance →customer loyalty | 0.641 | 0.035 | 0.000 | Yes |
| H9:Empathy →customer satisfaction | 0.728 | 0.028 | 0.000 | Yes |
| H10:Empathy →customer loyalty | 0.612 | 0.037 | 0.000 | Yes |
| H11:Technology→customer satisfaction | 0.640 | 0.031 | 0.000 | Yes |
| H12:Technology →customer loyalty | 0.594 | 0.039 | 0.000 | Yes |
| H13:Customer satisfaction → customer loyalty | 0.781 | 0.034 | 0.000 | Yes |

4.3.3. Mediation of Customer Satisfaction

Next, we addressed whether customer satisfaction with product/service can have a mediating effect which we measured using the PROCESS technique by Hayes (2012; 2013). The results, given in Table 4, demonstrate a mediating effect of customer satisfaction on the relationship between tangibility and loyalty($r$ = .10). The mediating effect of customer satisfaction was also demonstrated on the relationships between reliability and loyalty ($r$ = .08), assurance and loyalty ($r$ = .10), empathy and loyalty ($r$ = .15), as well as technology and loyalty ($r$ = .09).LLCI and ULCI for all relationships except responsiveness and loyalty have the same sign, which provides evidence to accept these hypotheses. However, results show that signs of LLCI and ULCI are not same in the case of the responsiveness and loyalty relationship. Therefore this hypothesis (H14c) was not accepted. The relationship of five service quality dimensions with loyalty of customers is positively mediated by customer satisfaction. Moreover, these findings verify all parts of hypothesis H14 (H14a to H14f) except H14c, which state that when

responsiveness is improved in banks, customers are satisfied with this progression, and in turn customer satisfaction level boosts loyalty with the bank's product/service.

**Table 4: Indirect effects**

| Hypothesis | Effect | Boot SE | LLCI | ULCI | Hypotheses support |
|---|---|---|---|---|---|
| **H14a:** | 0.1023 | 0.0297 | 0.0464 | 0.1647 | Yes |
| **H14b:** | 0.0811 | 0.0269 | 0.0317 | 0.1403 | Yes |
| **H14c:** | 0.0041 | 0.0292 | -0.0618 | 0.0572 | No |
| **H14d:** | 0.1009 | 0.0287 | 0.0540 | 0.1674 | Yes |
| **H14e:** | 0.1446 | 0.0398 | 0.0274 | 0.2264 | Yes |
| **H14f:** | 0.0848 | 0.0328 | 0.0301 | 0.1697 | Yes |

### *4.4. Discussion*

The findings of this research provide strong evidence that all dimensions of service quality significantly enhance customer loyalty. That is, tangibility, reliability, responsiveness, assurance, empathy, and technology within the processes of the service quality model increase customer loyalty. This result confirms the study by Sureshchandar et al. (2003) which encouraged business organizations (specifically banks) to focus on these dimensions in order to create loyalty. Furthermore, the five dimensions of service quality (tangibility, reliability, assurance, empathy, and technology) affect loyalty via customer satisfaction. These results are consistent with the findings of previous research (Glaveli et al., 2006; Ndubisi, 2006) that stated when these traits of service quality are incorporated by employees; they directly enhance consumer loyalty and satisfaction, which leads to their loyalty towards any bank. When customers are provided assurance, reliability, and tangibility of service from a bank's employees, the customer experience and association with the bank improves, and good experiences lead to their satisfaction and loyalty. Likewise, the significant link between empathy, customer loyalty and customer satisfaction is also evidenced in this research, in accordance with previous research (Ndubisi, 2006).

Similarly, advancement of technology influences customer satisfaction and loyalty. These outcomes are consistent with past studies (Ganguli and Roy, 2011; Ehigie, 2006). However, although responsiveness directly increases customer loyalty, customer satisfaction does not mediate the relationship between responsiveness and customer loyalty.

When addressing consumer queries regarding products or processes, instant response to consumers and better solutions to problems can increase customer loyalty. But customer satisfaction through responsiveness does not affect their loyalty. This result is contradictory to the findings of Glaveli et al. (2006).It is imperative that banks prioritize the design of policies and processes of service provision, addressing consumer needs for service quality. This may contribute to higher levels of customer satisfaction and customer loyalty.

## 5. Conclusions

Previous research indicates that there is direct influence of service quality on customer loyalty. However, a gap still exists in literature that analyzes different mediation mechanisms of this relationship. Based on expectation disconfirmation theory, the purpose of this research was to determine if customer satisfaction mediates the relationship between service quality and customer loyalty. This study provided the evidence for this mediation and found that customer satisfaction strongly mediates the link between customer loyalty and the five service quality dimensions of tangibility, reliability, assurance, empathy, and technology in the banking industry of Pakistan. We found that responsiveness only directly affects customer loyalty, but not via the mediation of customer satisfaction.

### *5.1. Directions for Further Work*

Outcomes of this work can be understood within the scope of certain limitations. As our research was carried out in Pakistan, a developing country; the results may be different throughout other areas of world. The respondents were selected through convenience sampling; random sampling may be employed in future research work. The research design for data collection in our study was cross-sectional; longitudinal design can be utilized in future research. Outcomes may not apply for the customers of other industries outside of the banking sector; a study on other industries may be conducted to verify this direct relationship and mediating factors.

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