Is Negative Profitability-Leverage Relation the only Support for the Pecking Order Theory in Case of Pakistani Firms?

ATTAULLAH SHAH and JASIR ILYAS

Previous studies on capital structure in Pakistan have reported evidence in support of the pecking order theory. However, this evidence is largely based on testing one dimensional relationship between leverage ratios and firms' profitability. The objective of this paper is to extensively test the pecking order theory in Pakistan with well-known pecking order testing models. Specifically, we use a sample of 321 firms listed on the Karachi Stock Exchange from 2000 to 2009 and test pecking order theory with models suggested by Shyam-Sunder and Myers, Frank and Goyal, Watson and Wilson, and Rajan and Zingales. Results of these models indicate that there exits only weak evidence in support of pecking order theory in Pakistan. However, strong support is found for pecking order theory when leverage ratios are regressed on profitability ratio, along with a set of control variables. This discrepancy in the results of the two sets of models needs further investigation, as well as care in interpreting the results of existing studies on capital structure in Pakistan. Our results show robustness even after controlling for possible profits understatements or weak corporate governance practices.

1. INTRODUCTION

Many theories have been presented and tested to explain corporate capital structure choices; however, none of these theories has been able to come up with a comprehensive explanation of the capital structure choices of firms in different industries and/or countries. Because of this reason, Brealey, Myers, and Marcus (1999) included corporate capital structure in seven unanswered subject issues of finance. Debate over capital structure decision started with the ground-breaking work of Modigliani and Miller (1958) who argued that corporate capital structure is inconsequential to the value of a firm and hence there exists no optimal capital structure. However, Modigliani and Miller reached this conclusion under the assumption of perfect capital markets. Once the assumption of perfect capital markets is relaxed and real-world market imperfections are allowed to play a role in firm-financing decisions, then optimal capital structure does exist.

Existing capital structure theories build their arguments around different market frictions such as taxes, information asymmetry, agency costs, and different types of

Attaullah Shah <attaullah.shah@imsciences.edu.pk> is a Faculty Member at the Institute of Management Sciences, Peshawar. Jasir Ilyas <jasirilyas@yahoo,com> is Faculty Member at City University of Sciences and Information Technology, Peshawar.

transaction costs. Among these theories, the most heavily discussed and empirically tested theories are the trade-off theory and the pecking order theory. The trade-off hypothesis was first proposed by Kraus and Litzenberger (1973); however, it was later modified and refined by a number of studies. The trade-off theory proposes that there exists a trade-off between the benefits and costs of debt financing. Debt financing benefits a firm because interest expense serves as tax-shield. And cost of debt financing arises from the increase in probability of bankruptcy as debt financing subjects a firm to fixed periodic interest and principal payments. An optimal capital structure is reached at a point when benefits and costs of debt financing from a one additional dollar of debt financing become equal. The pecking order theory states that financing behaviour of a firm follows a pecking order because information asymmetry costs are different for different sources of funds [Myers (1984)]. When funds are required by a firm, it first uses the internally-generated funds. Internally available funds can be employed to meet funding requirements without information costs and time constraints. When the funding requirements exceed internally available funds, only then the firm opts for external financing. While choosing between debt and external equity financing, a firm prefers a less costly source of financing over the costly one [Myers (1984)]. Equity has information asymmetry problem; therefore, debt financing is a less costly choice. Information asymmetry means that managers and potential investors do not have equal information regarding the firm's future cash flows. Potential investors know that corporate managers will work in the interest of existing shareholders and will issue equity only when shares are overpriced in the market. Therefore, when equity is issued, potential investors will discount it in view of possible overpricing. This makes issuance of equity costly for the existing equity holders. Consequently, a firm will prefer to use debt before issuing equity when external financing is required. This forms an order in financing behaviour of firms. Firms first pick internally available funds i.e. retained earnings as a financing source. If these internal finances are inadequate to meet the funding requirements then the firm will opt for external financing in order of preference from least risky debt (straight debt) to more risky debt (convertible debts), preferred stocks and lastly equity financing [Myers and Mujluf (1984) Myers, (2001)].

Empirical work has provided evidence, in favour of as well as against, both the theories. The relationship between profitability and leverage of a firm is considered as a focal point when it comes to testing these theories. Under the trade-off theory, it is predicted that profitable firms will try to use more debt financing. It is because these firms are less risky and hence they will try to gain maximum tax advantage provided by leverage [Barclay and Smith (2005)]. The tax advantage associated with debt financing increases after tax cash flow of the firm. This way the trade-off theory suggests a positive relationship between profitability and leverage of the firm. Contrary to the trade-off theory, the pecking order theory predicts a negative relationship between profitability and leverage because a profitable firm will have more retained earnings over a period of time. This reserve of funds could be used as first choice of financing when the firm is in need of funding for purchase of new assets or financing a project. Thus, there will be less need for external financing. In contrast, a less profitable firm will have less to retain and will be unable to meet its funding requirement with internally generated funds. Such a firm has to meet its funding requirements through external financing, which according to the

pecking order theory ought to be debt financing. This way, the pecking order theory predicts a negative relationship between leverage and profitability.

Many empirical studies have supported the pecking order theory primarily based on the negative profitability-leverage relationship. Booth, *et al*. (2001) studied firms in 10 developing countries and found a negative relationship between profitability and leverage. Similarly, [Tong and Green (2005)] reported significant inverse relationship between the current as well as past profits and leverage. [Qureshi (2009)] followed the work of Tong and Green (2005) and found support for the pecking order theory on the basis of a negative relation between the two variables. Moreover, studies such as Sinan (2010) and Ozkan (2001) from UK; Sheikh and Wang (2010), Qureshi (2009), Ilyas (2008) and Hijazi and Shah (2004) from Pakistan; and Gaud, *et al.* (2005) from Switzerland; and Serrasqueiro and Nunes (2010) from Portugal provided evidence in favour of a negative relation between the two variables.

A major twist in testing the pecking order theory came with the study by Shyam-Sunder and Myers (1999). They shifted the focus from profitability-leverage relationship to a more refined proxy for testing the pecking order hypothesis. They argued that external funding requirements of a firm should be matched dollar to dollar by changes in debt financing. Therefore, if pecking order theory holds, coefficient of funding deficit should be one in the regression of net debt issues. [Frank and Goyal (2003)] further modified the approach of Shyam-Sunder and Myers (1999) to use individual components of funding deficit in the regression of net changes in leverage levels, instead of using just one composite figure for funding deficit. Following the approach of these two studies, a large number of studies have reported mixed support for the pecking order theory.

Existing studies on this topic in Pakistan [see, e.g., Sheikh and Wang (2010) Qureshi (2009), Ilyas (2008), Khan and Shah (2007) Hijazi and Shah (2004) and Booth, *et al.* (2001)] use the profitability-leverage relation to explain the financing pattern of Pakistani firms. This provokes a natural question whether the negative profitability-leverage relationship is the only support for the pecking order theory in Pakistan? Review of literature suggests that there are several models such as models suggested by [Sunder and Myers (1999), Frank and Goyal (2003) and Watson and Wilson (2002)] to test the pecking order theory. These models use different assumptions and techniques to confirm the existence of the pecking order theory apart from just profitability-leverage relation. Therefore, a need for a comprehensive study is felt which can find evidence in support of or against the presence of the pecking order theory in financing pattern of Pakistani listed firms using a set of recently developed alternative models in this area. There is additional motivation for testing pecking order theory in Pakistan. Pecking order theory considers information asymmetry costs as the prime determinants of firms' financing choices. Since information asymmetry problems are expected to be higher in developing and emerging markets [see, e.g. Balasubramanian, *et al*. (2010), Jabeen and Shah (2011), Seifert and Gonenc (2008b), Stiglitz (1989)], Pakistan is a good candidate to test the pecking order theory.

Besides the above, our unique contribution to the literature lies in the fact that no previous study in Pakistan on the given topic has controlled for possible earning understatements or poor corporate governance practices. There is some evidence that corporate governance practices are weak in Pakistan where insider-controlling

shareholders try to expropriate outside minority shareholders or try to evade taxes through earning understatements. [See, e.g., Abdullah, *et al.* (2012)]. Earning understatements or poor corporate governance might contaminate our results. We have controlled for this possibility in two ways. First, we estimate all regression models on a full sample of 321 firms, and also on a sub-sample of 102 firms for which corporate governance compliance score was available. This score was obtained from Tariq and Abbas (2013) who measured compliance with the code of corporate governance of Securities and Exchange Commission of Pakistan on more than 50 dimensions. The sub-sample was further divided into two groups of firms i.e. firms with higher compliance score and firms with lower compliance score. Then all the regression models were estimated separately for each group to compare whether corporate governance practices drive our results. Our second approach to control for possible earning understatement is to divide firms into three groups based on 25th, 50th, and 75th percentiles of firms' profitability. If discretionary understatement of earnings have any effect on our analysis, that should be visible in the results of these three groups. Separate regressions were estimated to see whether explanatory variables of interest behave randomly across these groups.

In next section, we review the relevant literature. After that, we discuss the data sources, sample, and choice of models in Section 3. In Section 4, results and findings of the empirical analysis are presented and discussed. Section 5 concludes the paper.

2. REVIEW OF LITERATURE

This section reviews the relevant literature for developing a set of testable hypotheses. The review specifically focuses on models used to test pecking order theory of corporate capital structure.

Donaldson (1961) found that majority of firms used internally generated funds as a first choice of financing even with fairly high PE ratio. He formulated the pecking order hypothesis which was later on modified and refined by Myers (1984) and Myers and Majluf (1984) Myers (1984) proposed the pecking order in the context of asymmetric information and highlighted the shortcomings of the trade-off theory in the presence of correction costs to optimal leverage ratio. According to Myers, a firm adjusts its capital structure to maximise its value by changing the level of debt. Myers highlighted that trade-off theory holds only when costs of these corrections are zero. Myers and Majluf (1984) proposed that firms should issue equity only when balanced information exists between managers and potential investors. However, when the condition of balanced information does not hold, equity issuance can be harmful to the interest of its existing equity holders. This happens because potential investors know that managers will work in the interest of existing shareholders and will issue equity only when shares are overpriced in the market. Therefore, when equity is issued, potential investors will try to correct the share price downward. They do so because they feel they are exposed to adverse selection in the presence of information asymmetry. Thus, information asymmetry between managers and potential investor makes equity financing costlier. This led Myers and Majluf to propose that in the presence of information asymmetry, a firm should depend on past equity reserves or surplus profits retained over period of time along with savings through reduction in dividend pay-outs as a first choice of financing. If internal

funds are insufficient, firms would then choose debt financing before going for equity issuance because debt issuance has lower information asymmetry costs.

With the increasing focus on pecking order theory, researchers developed several different models to test this theory under different assumptions. These models focused primarily on how firms finance their funding deficits. Among the pioneering works in this area was the study by Shyam-Sunder and Myers (1999). Their model implies that for the pecking order theory to hold, a dollar of financing deficit should be funded by a dollar of debt financing. Thus, in the regression of net debt issue, funding deficit should return slope coefficient of one. The results of their study mostly favoured pecking order theory as compared to trade-off theory. Chirinko and Singha (2000) criticised Shyam-Sunder and Myers model (SSM) on the grounds that their model contained only financing deficit and debt financing while equity financing was missing. If equity, as a last resort, is accommodated in the model then slope coefficient won't be equal to one as suggested by SSM model. Furthermore, Chirinko and Singha marked other weaknesses of SSM model such as it does not speak of the situation in which equity is issued prior to debt or when debt and equity financing are used in fixed proportions. Moreover, Frank and Goyal (2003) challenged the generalisation of the empirical results in Shyam-Sunder and Myers (1999) on grounds that the sample of 157 firms used in their study was relatively small for publically traded US firms.

The SSM model argues that change in debt financing is purely a result of change in funding deficit. A challenge to this argument comes from target adjustment models which argue that changes in debt financing show attempts of a firm to adjust to its target capital structure with the passage of time. A number of studies used SSM model and target adjustment models to test the pecking order theory. These studies include [Dang (2005), Hovakimian and Vulanovic (2008), Seifert and Gonenc (2008b)]. A brief overview of these studies is presented. Dang (2005) tested the pecking order theory and the trade-off theory using a sample of UK firms for the period 1996-2003. He found that most of the tested firms adjust to their ideal leverage ratio with a substantial speed. This study also tested both theories together in one model and found that the trade-off theory did well in contrast to the pecking order theory. Hovakimian and Vulanovic (2008) tested funding of the long term retiring debt instead of funding deficit in SSM model. Conventional SSM model regresses financing deficit on new debt financing. The study argued that doing so was in line with pecking order theory as maturing debts were financed by new debt after exhausting inside funds. This fact was evident from negative intercept term which shows employment of inside funds before new debt funding. The pecking order theory failed when retiring debt was regressed on outside funding, i.e. debt and equity together, where the regression produced a positive intercept term. The study argued this failure is in line with the finding of Leary and Roberts (2007). And finally, Seifert and Gonenc (2008b) argued that emerging economies have more information asymmetry problems; therefore, they should mostly follow pecking order theory. They tested pecking order theory in 23 emerging economies. Results of their study revealed that equity financing is preferred over debt financing in these emerging economies which was inconsistent with pecking order theory. In a more recent study, Komera and Lukose (2014) tested the role of pecking order theory in Indian market and found that pecking order theory cannot explain capital structure of the firms used in the sample.

Frank and Goyal (2003) argued that SSM model uses an aggregated value for funding deficit, which is less informative. They suggested that the funding deficit should be disaggregated into its individual components and then be tested in conventional leverage regressions. Using this modified model, Frank and Goyal (2003) studied US public firms over a period 1971-1998 to know how these firm finance their funding deficits. They found that the sample firms used equity financing to meet funding deficit. Frank and Goyal also found that support for pecking order theory declines over a period of time. This declining support was found in case of both large and small firms. Large firms somewhat tend to follow pecking order theory in comparison to small firms. Theoretically, as highlighted by Berger and Udell (1995), small firms should follow pecking order theory more than large firms as small firms are more susceptible to information asymmetry problems. Frank and Goyal argued that small firms did not follow pecking order theory because most of them went public during 1980s and 90s. Later on, several studies including Flannery and Rangan (2006) and Huang and Ritter (2007) reported findings similar to that of Frank and Goyal. Seifert and Gonenc (2008a) extended the work of Frank and Goyal (2003) to British, German and Japanese firms along with American firms using OLS and fixed effect models. They found results similar to Frank and Goyal study with exception of Japanese firms. Overall results from US, Britain and Germany do not support the presence of pecking order theory. However, large sized US and German firms followed pecking order theory. Importantly large sized US firms with higher profitability were following pecking order theory but surprisingly in case of large sized Japanese firms, even firms with low profitability were following pecking order theory.

Several other studies have used quite different methodologies to test pecking order theory. For example, [Bharath, *et al*. (2009)] tested information asymmetry as a key driver of pecking order theory. They found that with an increase in information asymmetry, firms avoid their financing through equity which is in line with pecking order theory. However, they argued that it does not completely determine the financing source selection of the firms. In case of highest information symmetry, only 30 percent of the funding requirements are fulfilled with debt instead of 100 percent as implied by pecking order theory. They concluded that information asymmetry is significant but not the sole determinant of leverage. Another study that used a different approach to test the pecking order theory was [Autore and Kovacs (2004)] who investigated the pecking order theory in relation with changing adverse selection cost over time. The study took dispersion in analysts' earnings estimates as a measure of adverse selection cost. The study used pooled and fixed-effect regression models and found that with the lower adverse selection cost, firms tend to finance themselves via outside sources, preferably with equity. However, in case of a firm with higher adverse selection costs, traces of the pecking order theory were found. The study further found that firm profitability is negatively associated to adverse selection costs, outside financing and changes in debt. And finally, [Ghosh and Cai (2004)] used different tests and found that typically firms which have debt level greater than industrial average ultimately move towards the industry mean debt ratio. This fact shows that firms that have debt ratio above the industry average, they trace the trade-off theory. Such firms try to readjust their debt level towards the target industrial debt level by lowering it. Whereas those firms which have a lower level of debt, do not show the same tendency as they are not bothered by their existing debt level.

Fama and French (2005) argued that the pecking order theory is not complete capital structure model as information asymmetry problem is not a prime driver of financing choices. They argued that information asymmetry problem can be avoided by changing the ways of issuing equity, for example mergers can be financed with stock, repurchased plans, employee's stock options and rights offering. Thus equity issuance is not a last choice of financing as predicted by the pecking order theory. In their empirical tests, they found that firms do issue equity generally and retire equity even when firms have funding deficits which is against the pecking order theory implications. In times of financing surplus, firms do retire debts. Similar to [Lemmon and Zander (2004)], Fama and French pointed out that usually firms with funds deficit, low profitability and good growth opportunities issue equity.

In conclusion, the review reveals that testing pecking order theory goes beyond using just profitability-leverage relationship. Second, only mixed support exists for pecking order and that too is declining in the recent times.

2.1. Hypotheses of the Study

In light of the literature cited above, we develop and test the following hypotheses regarding the relevance of pecking order theory to Pakistani corporate financing behaviour.

H_1: Funding deficit determines the debt level of the firm.
H_2: Internally available retained earnings are preferred over debt financing.
H_3: Aggregation of funding deficit components is less informative.
H_4: Funding deficit contributes more as a determinant of leverage as compared to other conventional determinants of leverage.
H_5: Retained earnings are preferred over debt financing whereas debt financing is preferred over equity financing.

3. METHODOLOGY

3.1. Data of Study

Data for the study are taken from State Bank of Pakistan's publication "*Balance Sheet Analysis of Joint Stock Companies Listed on the Karachi Stock Exchange*". Sample period for the study covers the years 2000 to 2009. Total number of non-financial firms listed in 2000 were 520; however, the number of listed firms decreased to 414 in (2009). This study selected all firms which had complete data available during the sample period. After exclusion of outliers and incomplete data, we were left with a final sample of 321 firms.

3.2. Models to Test Pecking Order Theory

3.2.1. *SSM Model*

We start with the model developed by [Shyam-Sunder and Mayer (SSM) (1999)]. This model has also been used by many empirical studies like [Dang (2005), Hovakimian and Vulanovic (2008), and Seifert and Gonenc (2008b), and Komera and Lukose (2014)].

These studies used the model with slight amendments to test the pecking order theory. This model is not considered a perfect model in general, which was accepted by Shyam-Sunder and Myers. This model has been heavily criticised in empirical studies such as [Chirinko and Singha (2000) etc.]. Still due to its simplicity and good first order approximation this model has been used in many studies around the globe in testing the pecking order theory. The pecking order theory suggests that external equity financing is used only as a last resort; whereas as a first option, firms will use debt financing when their funding needs exceed the internally available funds. So every dollar of a firm's deficit is met by each dollar of debt financing of the firm, which will result in slope coefficient equal to 1. Thus, this formulation can be expressed in the following form;

$$\Delta D_{it} = \alpha + \beta_P DEF_{it} + e_{it} \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (1)$$

Whereas $DEF_t = DIV_t + X_t + \Delta W_t + R_t - C_t$

In Equation (1), ΔD_{it} shows the change in debt level of a firm i between time t and $t-1$. This value is expected to be positive if a firm faces funding deficit i.e. the firm will obtain external financing. In case the funding deficit is negative, the firm will retire its debt in that year. β_P is the pecking order coefficient. *DEF* represents the internal funds deficit. Funding deficit is a combination of dividend payment (*DIV*), capital expenditure (*X*), net increase in working capital *(ΔW)* and current portion of long term debt at the beginning of time t (*R*) minus operating cash flow after interest and tax (*C*). All these components are expected to have a positive relationship with funding deficit except operating cash flow which should be negatively related to funding deficit. To control for scale differences, all the variables are scaled by total assets.

Typical definition of funding deficit in SSM also includes current portion of long term debt (*R*) as a component. However, Frank and Goyal (2003) found that, contrary to pecking order theory, this component showed negative relation with net debt issued. They also argued that this component already exists in change in working capital component so it does not need to be repeated. The fact that the funding from internal sources is preferred over debt financing is represented by term "α" in Equation (1) which is expected to have zero value.

3.2.2. *Frank and Goyal Disaggregation Model*

In contrast to SSM model, Frank and Goyal (2003) argued that aggregation of funding deficit in one value is not very informative. These components can reveal more information about debt financing behaviour when studied independently. Therefore, they suggested that funding deficit as in Equation (2) is more appropriate. Our second model is adopted from Frank and Goyal (2003)

$$\Delta D_{it} = \alpha + \beta_{Div} DIV_t + \beta_X X_t + \beta_W \Delta W_t + - \beta_C C_t + e_{it} \qquad \ldots \qquad \ldots \qquad \ldots \qquad (2)$$

Theoretically, unit change in each of these components of funding deficit must lead to unit change in debt financing i.e. $\beta_{Div} = \beta_X = \beta_W$ a $= \beta_C = 1$ to confirm the pecking order theory.

3.2.3. *Frank and Goyal Conventional Leverage Model*

In order to address the omitted variable bias, Frank and Goyal estimated another equation that incorporates all previously identified explanatory variables in the leverage

regression. In view of this, we adopt the following model from Frank and Goyal. This model allows us to find relevant contribution made by the variable of interest (i.e. funding deficit), in the presence of other conventional variables. The model is given below:

$$\Delta D_{it} = \alpha + \beta_T \Delta T_{it} + \beta_G G_t + \beta_{LS} \Delta LS_{it} + \beta_P \Delta P_{it} + \beta_{DEF} DEF_{it} + e_{it} \qquad \dots \quad (3)$$

In Equation (3) ΔD, ΔT, ΔLS, ΔP, and DEF show the changes in debt level, tangibility, size, and profitability from previous period to the current period, and funding deficit of the firm, respectively. All variables are scaled by total assets, except growth and size which is the natural log of total assets.

A firm with higher tangibility ratio (i.e. proportion of fixed asset to total assets) can borrow at a relatively lower rate of interest by using fixed assets of the firm as collateral. A firm with a higher percentage of fixed assets is expected to borrow more as compared to a firm whose cost of borrowing is higher because of less fixed assets [Bradley, *et al.* (1984); Rajan and Zingales (1995); Kremp, *et al.* (1999) etc.]. From a different perspective, Harris and Raviv (1990) argued that a firm with lower tangibility has more information asymmetry problem. Therefore, under the pecking order theory, such a firm will go for more debt financing in comparison to equity financing after utilisation of internal funds. It is due to the fact that information asymmetry makes equity financing as an expensive option. Thus, we expect a negative relation between funding deficit and debt level of firms that have lower tangibility ratios. In this study tangibility is measured as a ratio of fixed assets to total assets.

According to the pecking order theory, a firm will use first internally generated funds which may not be sufficient for a growing firm. So next option for such growing firms is to use debt financing which implies that a growing firm will have a high debt [Drobetz and Fix (2003)]. Some studies suggest that firms with higher growth are expected to have lower leverage. This is based on the fact that debt is supported by assets-in-place rather than growth opportunities [Titman and Wessels (1988)]. Previous empirical studies have used various proxies for growth opportunities of a firm such as market-to-book ratio and yearly percentage changes in capital expenditure and total assets. Firms with high market-to-book value will opt more for equity financing. It is so to take advantage of high market value than book value. Later two proxies are component of funding deficit under SSM model and are expected to be positively related to debt. This study measures growth as a geometric mean of percentage increase of total assets of the firm with respect to the previous year. In this study, it is expected that firms with higher growth are expected to have higher leverage.

Size of the firm is closely related to risk and bankruptcy costs of a firm. Large sized firms tend to be more diversified and as a consequence they have a lower probability of bankruptcy. Thus creditors will be more willing to lend their funds to larger firms. Examining the effect of size in the determination of capital structure, Marsh (1982) and Bennett and Donnelly (1993) found that larger and more capital intensive companies are likely to employ more debt. On the other hand, as highlighted by Berger and Udell (1995), small firms should follow pecking order theory more than large firms as small firms confront information asymmetry problem more than large firms. The study measures the size as the natural logarithm of total assets.

About the profitability of the firm, trade-off theory predicts a positive relationship between leverage and profitability of the firm by arguing that highly profitable corporations in order to benefit from debt tax advantages would employ more debt. Finding of many studies, such as Titman and Wessels (1988), Baskin (1989), Allen (1993), Michaelas, *et al*. (1999), Fama and French (2002) and Tong and Green (2005) challenged this prediction. However, the pecking order theory predicts that if a firm is profitable then it is more likely that financing would be from internal sources rather than external sources to finance their operations and investments. Debt typically grows when investment exceeds retained earnings and falls when investment is less than internal funds. Hence a negative relationship between leverage and profitability is expected. This study measures profitability as net income of the firm divided by total assets.

Similarly, when funding requirements are in excess of internal funds, , there is a need for external funding. External funding includes both debt and equity. The pecking order theory predicts that increase in funding requirement, i.e. funding deficit, results in more debt financing along with equity. However, the pecking order theory suggests a preference of debt over equity in the presence of information asymmetry. This study expects positive relationship between funding deficit and debt financing. Funding deficit is a sum of dividend payment, capital expenditure, net increase in working capital minus operating cash flow after interest and tax.

3.2.4. *Watson and Wilson Model*

We also use Watson and Wilson (2002) model. This model allows us to test whether firm prefers debt over equity in situations when internal funds have already been utilised. The model is given below;

$$(TA_{it} - TA_{it-1})/TA_{it-1} = \sum \alpha_i + \beta_1 (P_{it} - Div_{it})/TA_{it-1} + \beta_2 (EI_{it})/TA_{it-1}$$
$$+ \beta_3 (D_{it} - D_{it-1})/TA_{it-1} + v_{it} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

Whereas $\sum \alpha_i$ shows vector of firm fixed effects, *TA* shows total assets of the firm, *P* shows profits, *Div* shows dividends, *EI* shows changes in equity and finally *D* shows debts of the firm. In this model, internally available funds are represented as a remainder of profit after dividend payment. The equation tries to capture changes in total assets in relation to changes in equity and liabilities.

3.2.5. *Rajan and Zingales Model*

Lastly we use Rajan and Zingales (1995) model to know whether negative leverage-profitability relationship responds differently to different levels of profitability of Pakistani firms. Firms are categorised into three groups based on their profit levels by using 25th, 50th and 75th percentiles. These three groups are named as low profitable firms, average profitable firms and high profitable firms. The following model is tested for this purpose;

$$D_{it} = \alpha + \beta_1 (T_{it}) + \beta_2 G_{it} + \beta_3 LS_{it} + \beta_4 P_{it} + e_{it} \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

Where D_{it} is the total debt of firm *i* at time *t*, scaled by total assets, T_{it} is the ratio of tangible assets to total assets, *G* is the geometric mean of annual percentage increase in total assets, and *P* is the ratio of net income to total assets.

Under the pecking order theory, profitability of a firm should be negatively related to the debt financing of the firms as internal funds are preferred over external funding. Using Rajan and Zingales model for the above stated groups our interest lies in knowing whether the negative relation between profitability and debt financing remains the same for each level of profit or not. If it so, it would mean that the negative profitability-leverage relation holds true regardless of the level of profitability of the firm. If not so, it would mean the profitability-leverage relation is determined by the level of profits firms generate.

3.3. Panel Data Analysis

Since we use data on both cross-sectional and time-series dimensions, we employ different variants of panel data models for analysis. One might argue that many of the models are in difference form and hence fixed effects might not be an issue, still for comparison purpose we report results from random effects and fixed effects models. For formal selection between these two models, we employed the Hausman (1978) specification test. We also estimated pooled OLS for all models, but we do not report results as results from pooled OLS and random effects models were virtually similar.

3.4. Robustness Checks

There is an anecdotal evidence of weak corporate governance in Pakistan. For example, there is large scale tax evasion, firms are closely held and controlled, banks rather than markets dominate corporate finance, and accounting statements may not reflect the true state of affairs. In such an environment while it is quite legitimate to study financing patterns and behaviour of corporations, simple tests of the theories are not likely to be productive exercises.

In view of the above, we conduct our analysis on full sample of firms and use several robustness checks to see whether results change substantially once we account for weak corporate governance or potential profit understatements in Pakistani firms. For this purpose, we have borrowed corporate governance compliance index (CGCI) for 102 firms from Tariq and Abbas (2013). They have developed this index to measure the extent to which companies follow the Code of Corporate Governance of the Securities and Exchange Commission of Pakistan. We divided the 102 companies into two groups based on the median value of CGCI. These groups are named as 'High CG and 'Low CG. Our interest lies in the comparison of the results from different models estimated on the data of all firms, Higher CG firms, and Lower CG firms. We want to see whether our results are driven by weak or good corporate governance practices.

Our second robustness check to control for the understatement of profits problem is to estimate Rajan and Zingles (1995) model (see Section 3.2.5) for three groups of firms which are formed on the basis of 25th, 50th, and 75th, percentiles of firms' profitability. For each group of firms, we estimate the model and want to see whether the key variables change their signs or significances. If profits understatements drive the results, then the coefficients of the explanatory variables will behave randomly across these groups of firms. In unreported work, we also estimated all models for high- and low-profit groups of firms (low group included firms in 25th percentile of profitability, and high group included firms in the 75th percentile of profitability) to compare results

across different profitability groups. The results of these regressions show that profits level do change the basic results. To save space, we do not report these results, however, they can be supplied upon request from the authors.

4. ANALYSIS AND FINDINGS

In this section, we present and discuss results of the empirical models. Since we are dealing with panel data, we have to choose between fixed and random effects models. Almost in all models, the Hausman (1978) specification test indicated to use fixed effects model. However, for comparison purpose, we report results from both fixed and random effects models. In all of the regression tables from Table 4.1 to 4.4, first column shows names of the variables, second and third columns report results from the random and fixed effects models, respectively. As discussed in Section 3.4, we also report results from a subset of firms for which corporate governance compliance data were obtained from Tariq and Zaheer (2013). A total of 102 firms are included in this sub-sample. Fourth column of the regression tables report results for all these 102 firms whereas fifth and sixth columns report results for two groups of firms which are divided according to the median value of the compliance index. Firms with high corporate governance compliance index are named as 'High CG' whereas firms with low compliance index are named as 'Low CG'.

4.1. Results from SSM Model

Results of Shayam-Saunders and Myers (SSM) model are given in Table 1. Standard errors are reported in parentheses, whereas ***, **, and * show significance at 1 percent, 5 percent, and 10 percent, respectively.

Table 4.1

Results of the SSM Model

$$\Delta D_{it} = \alpha + \beta DEF_{it} + e_{it} \ldots \ldots \ldots (1)$$

VARIABLES	(1) Random Eff.	(2) Fixed Eff.	(3) CG All	(4) High CG	(5) Low CG
DEF	0.0319***	0.0857***	–0.0045	–0.0005	–0.0046
	(0.0085)	(0.0155)	(0.0163)	(0.0262)	(0.0215)
Constant	0.0559***	0.0582***	0.0557***	0.0528***	0.0582***
	(0.0029)	(0.0029)	(0.0046)	(0.0068)	(0.0066)
Observations	2,534	2,534	762	383	379
R-squared		0.0136	0.0001	0.0000	0.0001
Number of firms	321	321	102	56	56

Table 1: Change in debt level scaled by total assets is the dependent variable. Whereas funding deficit variable (DEF) is measured as a sum of dividend payment, capital expenditure, net increase in working capital minus operating cash flow after interest and tax. Both variables are scaled by total assets. Standard errors are reported in parentheses, whereas ***, **, and * show significance at 1 percent, 5 percent, and 10 percent, respectively.

Under the pecking order theory, SSM argue that the slope coefficient of funding deficit must be equal to one. A firm uses debt funding when their funding needs exceed the internally available funds. Every dollar increase in funding deficit after utilisation of internally available funds will be met by a dollar of debt financing. Whereas equity funding is used only as a last resort and is relatively rare. The results in Table 4.1 show that the slope coefficient of funding

deficit is 0.085 and R^2 has a value 0.0136 in fixed the effects model. These findings show only a weak support for the pecking order theory. The positive coefficient of funding deficit is in accordance with prediction of SSM model, but the coefficient value of funding deficit is too low against its expected value that should be near 1. In fact the coefficient of funding deficit was reported 0.76 by Shayam-Saunders and Myers (1999) and 0.75 by Frank and Goyal (2003) when they used a sample of firms that had no gaps in the data. However, when they relaxed the continuous data restriction and estimated the equation on full sample, the funding deficit coefficient declined to 0.28. Further, they noted that with the passage of time, SSM model showed declining support for the pecking order theory. Another important fact is that the pecking order theory predicts the preference of internal source of funding over debt financing. But our results show that intercept has significant positive value. This fact is against the pecking order theory. Therefore, the study rejects the hypothesis that internally available retained earnings are preferred over debt financing.

Comparing results in 'High CG' and 'Low CG' groups, we observe that results in these two groups are not different. In fact, financial deficit seems to have no influence on debt ratio in the full sample of 102 firms for which corporate governance data is available or in the high or low compliant groups. This shows that corporate governance practices do not alter the results.

4.1.2. *Results of Frank and Goyal Disaggregation Model*

Second model used in this study is the model of Frank and Goyal (2003) who proposed to disaggregate funding deficit factor in the SSM model. Table 4.2 presents results of Frank and Goyal disaggregation model. Standard errors are reported in parentheses, whereas ***, **, and * show significance at 1 percent, 5 percent, and 10 percent, respectively.

Table 4.2

Results of the Frank and Goyal Disaggregation Model

$$\Delta D_{it} = \alpha + \beta_{Div}DIV_{it} + \beta_X X_{it} + \beta_W \Delta W_{it} + - \beta_C C_{it} + e_{it} .... (2)$$

Variables	(1) Random Eff.	(2) Fixed Eff.	(3) CG All	(4) High CG	(5) Low CG
DIV	0.0001**	0.0000	0.0000	0.0000	–0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)
ΔW	–0.0181**	–0.0900***	–0.0338**	–0.0333	–0.0297
	(0.0089)	(0.0185)	(0.0158)	(0.0259)	(0.0205)
X	0.5661***	0.5141***	0.6292***	0.5884***	0.6581***
	(0.0271)	(0.0300)	(0.0497)	(0.0735)	(0.0679)
C	–0.1811***	–0.2905***	–0.1801***	–0.1490**	–0.2129***
	(0.0282)	(0.0387)	(0.0505)	(0.0714)	(0.0743)
Constant	0.0437***	0.0523***	0.0492***	0.0479***	0.0519***
	(0.0033)	(0.0041)	(0.0061)	(0.0096)	(0.0081)
Observations	2,534	2,534	762	383	379
R-squared	0.1349	0.1493	0.1966	0.1637	0.2314
No. of Firms	321	321	102	56	56

Table 4.2: Change in debt level is dependent variable of the model and is measured as the difference of total liabilities at time *t* with respect to time *t₋₁*, scaled by total assets Independent variables are dividend payment (*DIV*), capital expenditure (*X*), net increase in working capital (*ΔW*) and operating cash flow (*C*). All these variables are scaled by total assets. Dividend payment is the amount of dividend paid by the firm for the year, capital expenditure is change in net fixed assets with respect to the previous year, working capital is the difference between current asset and current liabilities of the firm; and the operating cash flow after interest and tax is equal to net income plus depreciation for the year. Standard errors are reported in parentheses, whereas ***, **, and * show significance at 1 percent, 5 percent, and 10 percent, respectively.

Results in Table 4.2 suggest that the coefficients of each component of the funding deficit are significantly different from one. Under the pecking order theory, one unit change in any component of the funding deficit should lead to a unit change in debt level. The results do not support this prediction of the pecking order theory as proposed in SSM model. Results show that aggregation of the components of funding deficit term is less informative. Since aggregation of funding deficit is not justified, study of the individual components can reveal more information.

Further, we find that the coefficient of dividends (*DIV*) is positive and is statistically significant only in the random effects model. The positive coefficient implies that dividend paying firms use more debt financing. Since its coefficient is marginally significant, it supports the pecking order theory to some extent. The coefficient value of capital expenditure (*X*) ranges from 0.51 (in the fixed effect regression) to 0.65 (in the lower CG regression), and is positively related to debt financing. The positive relation between capital expenditure and debt financing is in accordance with both the pecking order theory and the trade-off theory. Under the pecking order theory, once internal funds are employed, increase in capital expenditure will increase funding deficit of the firm which will in turn increase debt financing. Under the trade-off theory, capital expenditures create tangible assets which can be used by the firm as collateral against debt financing.

Internally available operating cash flows (*C*) show a negative relation with changes in debt in all models. This finding is in line with the financing behaviour pattern laid down in the pecking order theory. However, if one considers profitability as a proxy of future growth opportunities, the trade-off theory would then also predict a negative relationship between profitability and debt financing. Working capital (ΔW) shows negative relation with the changes in debt. Pecking order theory predicts that after we control for internally generated funds, working capital needs should be financed dollar for dollar from debt financing. Thus, pecking order theory fails here.

In conclusion, we find only weak support for the pecking order theory using the Frank and Goyal model. This is evident not only from fairly small coefficients of the individual components of funding deficit, but also some of the components of the funding deficit yielded unexpected signs.

Results for firms that have corporate governance data are reported under column headings (3), (4) and (5) in Table 4.2. It is interesting to see that the results of the sub-sample are almost similar in statistical significance and coefficient signs as the full sample. Further, there is no significant difference in the results of firms that score high on corporate governance compliance index (High CG) and firms that score low on this index (Low CG).

4.1.3. *Results of Frank and Goyal Conventional Leverage Model*

In order to avoid omitted variable bias and to know the contribution made by each funding deficit variable, we follow the work of Frank and Goyal (2003) to modify Equation 1 into Equation 3 by adding previously identified explanatory variables. Table 4.3 presents results of Frank and Goyal model using conventional leverage regression.

Table 4.3

Results of the Frank and Goyal Model Using Conventional Leverage Regression

$$\Delta D_{it} = \alpha + \beta_T \Delta T_{it} + \beta_G G_t + \beta_{LS} \Delta LS_{it} + \beta_P \Delta P_{it} + \beta_{DEF} DEF_{it} + e_{it}$$

Variables	(1) Random Eff.	(2) Fixed Eff.	(3) CG All	(4) High CG	(5) Low CG
ΔT	–0.0533***	–0.2828***	–0.0452*	–0.0577	–0.0373
	(0.0154)	(0.0355)	(0.0244)	(0.0362)	(0.0338)
G	0.3416***	.2581***	0.3520***	0.2843***	0.4291***
	(0.0307)	(.03145)	(0.0500)	(0.0732)	(0.0709)
ΔLS	0.0081***	0.0347***	0.0053	0.0018	0.0098*
	(0.0025)	(0.0066)	(0.0038)	(0.0055)	(0.0055)
ΔP	–0.3476***	–0.3568***	–0.2509***	–0.1797***	–0.3584***
	(0.0335)	(0.0453)	(0.0515)	(0.0682)	(0.0856)
DEF	0.0192*	0.0747***	–0.0071	–0.0137	0.0054
	(0.0098)	(0.0151)	(0.0193)	(0.0295)	(0.0264)
Constant	–0.0056	–0.0323	0.0007	0.0340	–0.0390
	(0.0183)	(0.0498)	(0.0298)	(0.0465)	(0.0410)
Observations	2,534	2,534	762	383	379
R-squared	.0832	0.0740	0.0785	0.0533	0.1156
Number of Firms	321	321	102	56	56

Table 4.3: Change in debt level is dependent variable of the model and is measured as the difference of total liabilities at time *t* with respect to time *t-1*, scaled by total assets. Independent variables are the tangibility, growth, size, profitability and funding deficit of the firm. These variables are denoted as *ΔT, G, ΔLS, ΔP,* and *DEF* respectively. This study measures tangibility as a ratio of change in fixed assets to total assets with respect to the previous year, growth as a geometric mean of percentage change in total asset of the firm with respect to the previous year, size as the change in natural logarithm of total assets with respect to the previous year, profitability as change in ratio of net income to total assets of the firm with respect to the previous year and funding deficit variable as a sum of dividend payment, capital expenditure, net increase in working capital minus operating cash flow after interest and tax. Standard errors are reported in parentheses, whereas ***, **, and * show significance at 1 percent, 5 percent, and 10 percent, respectively.

Result in Table 4.4 shows that tangibility is negatively related to changes in debt levels of the Pakistani firms. Negative sign of the coefficient of tangibility is in accordance with the pecking order theory as highlighted by Harris and Raviv (1990). Rationale of this negative relation is that firms with low tangibility have more information asymmetry problems. This makes equity financing more expensive for them, which in turn makes debt financing attractive after utilisation of internal funds. However, it is noted that this negative relation is in contrast to the findings of Hijazi and Shah (2004) and Ilyas (2008) who also studied the factors determining the leverage of Pakistani firms.

As expected under pecking order theory, slope coefficient of growth variable has a positive sign and is statistically significant. The observed relation between growth and change in debt level shows that growing Pakistani firms funding requirements exceed the internally available funds. Thus, these firms go for debt financing [Drobets and Fix (2003)]. Hence such firms behave in a pecking order. This finding is similar to the finding of Hijazi and Shah (2004).

The variable *LS* (a proxy for firm size) did not show the predicted sign under the pecking order theory. Its coefficient is positive and significant. Under the pecking order theory, smaller firms tend to use more debt financing as they have more asymmetric information problems [Berger and Udell (1995), Rajan and Zingales (1995), Frank and Goyal (2003)]. In contrast, the trade-off theory predicts a positive relation between firm size and debt financing as larger firms have more assets. Larger size increases the firm's ability to obtain more debt. Similarly, if size is taken as inverse proxy of probability of bankruptcy then larger size firms have a lower probability of bankruptcy that allows them to use more debt financing [Rajan and Zingales (1995)].

Negative slope of profitability (*ΔP*) is in accordance with the pecking order theory but in contrast to the trade-off theory. This shows that Pakistani firms employ their internal funds generated by profits before debt financing. Another possible explanation for this negative relation is that Pakistani firms may use profits to pay their debts. This negative relation was also found by Hijasiand Shah (2004) and Ilyas (2008).

The funding deficit variable (*DEF*) showed predicted relation with changes in debt i.e. it is positive and significant. However, its coefficient remains very low. Positive slope of funding deficit shows that with increasing funding deficit, internally available funds become inadequate and hence firms choose debt financing.

Overall the coefficients of the explanatory variables show predicted signs under the pecking order theory except size of the firm. Importantly, funding deficit explained less of the variation in debt level of the sample firms in the presence of other variables. Profitability and growth seem to be important determinants of debt level of Pakistani firms. Thus, this study rejects the hypothesis that funding deficit contributes more as a determinant of leverage as compared to other conventional determinants of leverage.

Comparing results of firms that are grouped on the basis of lower and higher compliance with code of corporate governance of SECP, one can see not much of a difference. Majority of the variables have their statistical significances and coefficient signs similar in both the groups, with the exception of size, which is marginally significant in 'Low CG' group and insignificant in the 'High CG' group.

4.1.4. *Results of Watson and Wilson Model*

We use Watson and Wilson (2002) model to investigate a firm's choice between debt and equity funding once internal funds are utilised. Table 4.4 presents the results of the Watson and Wilson model.

Results from the fixed effects model show that the coefficient of profitability has value of 0.4610 which is greater than the coefficient of equity financing which has a value of 0.4151but less than the coefficient of debt financing having value of 1.0032. These estimates are significant at 1 percent level of significance. Under the pecking order theory, the coefficients of debt must be greater than equity funding but lesser than internally available funds. The pecking order theory suggests that debt financing is utilised before equity financing which is used only in extreme circumstances when funding needs exceed internally available funds. Contrary to the prediction of pecking order theory, results of Watson and Wilson model suggest that external debt financing is preferred over other sources of funding. Second preference is given to internal source of financing i.e. profits and as a last resort equity financing is picked by Pakistani firms at

Table 4.4

Results of the Watson and Wilson Model

$$(TA_{it}\text{-}TA_{it\text{-}1})/TA_{it\text{-}1} = \sum\alpha_i + \beta_1 (P_{it} - Div_{it})/TA_{it\text{-}1} + \beta_2 (EI_{it})/TA_{it\text{-}1}$$
$$+\beta_3 (D_{it}\text{-} D_{it\text{-}1})/TA_{it\text{-}1} + v_{it}\ldots.(4)$$

Variables	(1) Random Eff.	(2) Fixed Eff.	(3) CG All	(4) High CG	(5) Low CG
$(P_{it} - Div_{it})/TA_{it\text{-}1}$	0.4014***	0.4610***	0.2968***	0.1904***	0.4958***
	(0.0364)	(0.0424)	(0.0559)	(0.0670)	(0.1011)
$(EI_{it})/TA_{it\text{-}1}$	0.1492***	0.4151***	0.1226***	0.1543***	0.0893***
	(0.0101)	(0.0155)	(0.0172)	(0.0233)	(0.0253)
$(D_{it}\text{-} D_{it\text{-}1})/TA_{it\text{-}1}$	1.0286***	1.0032***	1.1265***	1.0299***	1.2154***
	(0.0190)	(0.0183)	(0.0334)	(0.0433)	(0.0501)
Constant	–0.0011	–0.1009***	–0.0040	–0.0104	0.0034
	(0.0047)	(0.0061)	(0.0081)	(0.0116)	(0.0115)
Observations	2,534	2,534	762	383	379
R-squared	.5999	0.6476	0.6266	0.6331	0.6332
Number of firms	321	321	102	56	56

Table 4.4: Dependent variable of the model is changes in total asset at time t with respect to time $t_{\text{-}1}$ measured as a proportion of total assets and denoted as $(TA_{it}\text{-}TA_{it\text{-}1})/TA_{it\text{-}1}$. Independent variables include internally available funds $((P_{it} - Div_{it})/TA_{it\text{-}1})$, equity funding $((EI_{it})/TA_{it\text{-}1})$ and debt funding $((D_{it}\text{-} D_{it\text{-}1})/TA_{it\text{-}1})$. Internally available fund is measured as a reminder of profits after paying dividends. Equity funding is measured as shareholders equity and debt funding as change in total liabilities. All of the variables are calculated as a proportion of total assets. Standard errors are reported in parentheses, whereas ***, **, and * show significance at 1 percent, 5 percent, and 10 percent, respectively.

times of funding deficit. Results lead to rejection of the hypothesis that retained earnings are preferred over debt financing but accept that debt financing is preferred over equity financing. Thus, the results of Watson and Wilson model show only partial support for the pecking order theory in case of Pakistani firms.

4.1.5. *Results of Rajan and Zingales Model*

In view of poor corporate governance practices which might lead to understatement of profits to avoid taxes or expropriate minority shareholders in Pakistan [see, e.g., Abdullah, *et al.* (2012)], we are concerned that our results might be contaminated by reported earning understatements. As a robustness check, we categorise firms into three groups based on 25th, 50th, and 75th percentiles of the firms' profitability to see whether our results behave randomly across different reported profitability levels. These groups are named as low profit, medium profit, and high profit firms. Then we estimate Rajan and Zingales (1995) conventional leverage regression for each group separately. Table 4.5 presents results of Rajan and Zingales model.

Under the pecking order theory, firms having low profits and funding requirements will consider debt financing before they consider equity financing. Whereas firms with high profits will cover funding requirements with internal funds i.e. retained earnings. However, average profitable firms will have moderate external financing mostly from debt financing. So in each case, profitability of the firm must be negatively related to debt financing of the firm. Low profitable firms have highest slope coefficient value of –2.1296 for *P*. Then, average profitable firms have slope coefficient value of –1.8278.

Table 4.5

Results of Rajan and Zingales Model

$$D_{it} = \alpha_t + \beta_1(T_{it}) + \beta_2 G_{it} + \beta_3 LS_{it} + \beta_4 P_{it} + e_{it}$$

Variables	(1) Low Profits	(2) Average Profits	(1) High Profits
T	0.2685***	0.0408	0.0808*
	(0.0694)	(0.0560)	(0.0440)
LS	–0.0388**	–0.0124	0.0282***
	(0.0168)	(0.0126)	(0.0100)
G	–0.7248***	–0.6341***	0.0005
	(0.1587)	(0.1227)	(0.0929)
P	–2.1296***	–1.8278***	–0.5837***
	(0.2214)	(0.3991)	(0.1269)
Constant	0.8777***	0.8380***	0.2834***
	(0.1565)	(0.1064)	(0.1062)
Observations	633	633	633
R-squared	0.3131	0.1700	0.1737

Table 4.5: Debt (D_{it}) is the dependent variable of the model and is measured as the ratio of total liabilities at time t of $i,$ scaled by total assets. Independent variables include tangibility (T), growth (G), size (LS) and profitability (P) of the firm. We measure tangibility as a ratio of fixed assets to total assets, growth as a geometric mean of percentage changes in total assets, size as the natural logarithm of total assets, profitability as net income divided by total assets. Standard errors are reported in parentheses, whereas ***, **, and * show significance at 1 percent, 5 percent, and 10 percent, respectively

High profitable firms have lowest slope coefficient value of –0.5837. Results of Rajan and Zingales model show that for each level of profitability of firms, profitability is negatively related to debt financing. This negative relationship between profitability of the firm and its leverage is statistically significant in each category of profitability of the Pakistani firms. Thus, we can conclude that level of profitability of Pakistani firms does not affect negative profitability-leverage relationship. This finding is in line with the previous studies on capital structure in Pakistan [see, e.g., Shah and Hijazi (2004), Shah and Khan (2007)].

5. CONCLUSION

Previous studies in Pakistan on corporate capital structure used only a single dimension to test pecking order theory where they presented negative profitability-leverage relationship as an evidence in support of the pecking order theory. The objective of this study was to test whether or not empirical support exists for the pecking order theory in Pakistani firms when we employ a wide range of models that use different assumptions and hence employ different econometric techniques. For this purpose, we used financial data of 321 non-financial Pakistani firms listed on the KSE over the period 2000-2009. Results of Shayam-Sunder and Myers model showed that funding deficit is not matched dollar for dollar by changes in debt financing. However, results showed that there was a positive relationship between funding deficits and debt levels of the sampled firms. Moreover, SSM model yielded positive intercept term which is expected to have a

zero value under the pecking order theory. Positive intercept term means that internal funds were not preferred over other sources of financing at times of funding deficit. Our conclusion based on the above findings is that funding deficit has less explanatory power in determining the debt level of the Pakistani firms.

We also used the disaggregated model of Frank and Goyal (2003). Results revealed that the aggregation of funding deficit term is not justified. When studied individually, all of the components of funding deficit showed expected signs with change in debt level of firms, except changes in working capital. Capital expenditure showed statistically significant and positive relationship with changes in debt level of the firms. Whereas, operating cash flows and changes in working capital showed negative relationships with changes in debt ratios. The negative sign for working capital is in contradiction to the pecking order theory. Dividend payout showed insignificant negative relation with leverage, which is also contrary to the pecking order theory. Overall results from this model were mixed. Thirdly, we tested the impact of funding deficit in the presence of other determinants such as tangibility, size, growth and profitability of the firms on their debt ratios. We found that the contribution of funding deficit was negligible in explaining changes in debt ratios in the presence of other variables. Profitability and growth seem to be the most important determinants of changes in debt levels of Pakistani firms. Profitability was negatively related to debt ratio and was statistically significant. Firm size showed positive relation with debt ratio which indicates that larger firms can take more debt. This finding is also contrary to the prediction of the pecking order theory. Coefficient signs and significances of tangibility, growth, and profitability variables support the pecking order theory. Lastly we found that level of profitability of Pakistani firms does not affect the negative profitability-leverage relation. Whether the firms are less profitable or more profitable, a consistent negative relationship between profitability and leverage was observed. As a further robustness check, we used data on compliance with the SECP code of corporate governance to see whether our results behave differently among firms that show high and low compliance with the code. We found that our results do not change with the level of compliance.

Overall, we found very weak evidence in support of the pecking order theory using funding deficit regressions. However, strong support is found for pecking order theory when leverage ratios are regressed on profitability ratio, along with a set of control variables. This discrepancy in the results of the two sets of models needs further investigation, as well as care in interpreting the results of existing studies on capital structure in Pakistan.

REFERENCES

Abdullah, F., A. Shah, and S. U. Khan (2012) Firm Performance and the Nature of Agency Problems in Insiders-controlled Firms: Evidence from Pakistan. *The Pakistan Development Review* 51:4, 161–183.

Allen, D. (1993) The Pecking Order Hypothesis: Australian Evidence. *Applied Financial Economics* 3, 101–120.

Autore, D. and T. Kovacs (2004) The Pecking Order Theory and Time-Varying Adverse Selection Costs. Virginia Tech University. (Working Paper).

Barclay, M. and C. W. Smith (2005) The Capital Structure Puzzle: Another Look at the Evidence. *Journal of Applied Corporate Finance* 12:1, 8–20.

Baskin, J. (1989) An Empirical Investigation of the Pecking Order Theory. *Financial Management* 18, 26–35.

Bennet, M. and R. Donnelly (1993) The Determinants of Capital Structure: Some U.K. Evidence. *British Accounting Review* 25:1, 43–59.

Berger, A. N. and G. Udells (1995) Relationship Lending and Lines of Credit in Small Firm Finance. *Journal of Business* 68, 351–381.

Bharath, S. T., P. Pasquariello, and G. Wu (2009) Does Asymmetric Information Drive Capital Structure Decisions. *Review of Financial Studies* 22:8, 3211–3243.

Booth, L., V. Aivazian, A. Demirguc-Kunt, and V. Maksimovic (2001) Capital Structures in Developing Countries. *The Journal of Finance* LVI:1, 87–130.

Bradley, M., G. A. Jarrell, and E. H. Kim (1984) On the Existence of an Optimal Capital Structure: Theory and Evidence. *Journal of Finance* 39.

Brealey, R. A., S. C. Myers, and A. L. Marcus (1999) *Fundamentals of Corporate Finance* (2 ed.). McGraw Hill.

Brennan, M. and A. Kraus (1987) Efficient Financing under Asymmetric Information. *Journal of Finance* 42, 1225–1243.

Byoun, S. and J. C. Rhim (2005) Tests of the Pecking Order Theory and the Tradeoff Theory of Optimal Capital Structure. *Global Business Finance Review* 10:2, 1–16.

Chang, H. L., H. Y. Liang, C. W. Su, and M. N. Zhu (2010) The Choices of Capital Structure. *African Journal of Business Management* 4:15, 3332–3336.

Cheng, S. and C. Shiu (2007) Investor Protection and Capital Structure: International Evidence. *Journal of Multinational Financial Management* 17, 30–44.

Chirinko, R. S., and A. R. Singha (2000) Testing Static Tradeoff Against Pecking Order Models of Capital Structure: A Critical Comment. *Journal of Financial Economics* 58:3, 417–425.

Dang, V. A. (2005) Testing the Trade-off and Pecking Order Theory: Some UK Evidence. Paper presented at the Money Macro and Finance (MMF) Research Group Conference.

Donaldson, G. (1961) Corporate Debt Capacity: A Study of Corporate Debt Policy and the Determination of Corporate Debt Capacity. Paper presented at the Division of Research, Harvard Graduate School of Business Administration.

Drobetz, W. and R. Fix (2003) What are the Determinants of the Capital Structure? Some Evidence for Switzerland. University of Basel. WWZ / Department of Finance. (Working Paper No. 4/03).

Fama, E. F. and K. R. French (2005) Financing Decisions: Who Issues Stock? *Journal of Financial Economics* 76, 549–582.

Fama, E. F. and R. French Kenneth (2002) Testing Tradeoff and Pecking Order Predictions about Dividends and Debt. *Review of Financial Studies* 15, 1–33.

Flannery, M. J. and K. P. Rangan (2006) Partial Adjustment Target Capital Structures. *Journal of Financial Economics* 79, 469–506.

Frank, M. Z. and V. K. Goyal (2003) Testing of Pecking Order Theory of Capital Structure. *Journal of Financial Economics* 67, 217–248.

Frank, M. Z. and V. K. Goyal (2007) Capital Structure Decisions: Which Factors are Reliably Important? University of Minnesota and HKUST. (Working Paper).

Frank, M. Z. and V. K. Goyal (2009) Profits and Capital Structure. University of Minnesota and Hong Kong University of Science and Technology. (Working Paper).

Friend, I. and L. H. P. Lang (1988) An Empirical Test of the Impact of Managerial Self-interest on Corporate Capital Structure. *Journal of Finance* 43, 271–281.

Gaud, P., E. Jani, M. Hoesli, and A. Bender (2005) The Capital Structure of Swiss Companies: An Empirical Analysis using Dynamic Panel Data. *European Financial Management* 11, 51–69.

Ghosh, A. and F. Cai (2004) Optimal Capital Structure Vs. Pecking Order Theory: A Further Test. *Journal of Business and Economics Research* 2:8.

Gomes, A. R. and G. M. P. (2007) Private and Public Security Issuance by Public Firms: The Role of Asymmetric Information. Washington University in St. Louis and University of Maryland. (Working Paper).

Harris, M. and A. Raviv (1990) Capital Structure and the Informational Role of Debt. *The Journal of Finance* 45:2, 321–349.

Hausman, J. A. (1978) Specification Tests in Econometrics. *Econometrica*: *Journal of the Econometric Society*, 1251–1271.

Hijazi, S. T. and A. Shah (2004) The Determinants of Capital Structure in Stock Exchange Listed Non-Financial Firms in Pakistan. *The Pakistan Development Review* 43:4, 605–618.

Hovakimian, A. and M. Vulanovic (2008) Corporate Financing of Maturing Long-Term Debt. Paper presented at the Asian Finance Association.

Hovakimian, A., G. Hovakimian, and H. Tehranian (2004) Determinants of Target Capital Structure: The Case of Dual Debt and Equity Issues. *Journal of Financial Economics* 71, 517–540.

Hovakimian, A., T. Opler, and S. Titman (2001) The Debt-equity Choice. *Journal of Financial and Quantitative Analysis* 36, 1–24.

Huang, R. and J. R. Ritter (2007) Testing Theories of Capital Structure and Estimating the Speed of Adjustment. *Journal of Financial and Quantitative Analysis.* (Forthcoming).

Ilyas, J. (2008) The Determinants of Capital Structure: Analysis of Non-Financial Firms Listed in Karachi Stock Exchange in Pakistan. *Journal of Managerial Sciences* 2:3, 275–304.

Jabeen, M. and A. Shah (2011) A Review on Family Ownership and Information Asymmetry. *African Journal of Business Management* 5:35, 13550–13558.

Jalilvand, A. and R. S. Harris (1984) Corporate Behaviour in Adjusting to Capital Structure and Dividend Targets: An Econometric Study. *The Journal of Finance* 39:1, 127–145.

Jensen, M. C. and W. H. Meckling (1976) Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure. *Journal of Financial Economics* 3:4, 305–360.

Jung, K., Y. Kim, and R. Stulz (1996) Timing, Investment Opportunities, Managerial Discretion, and the Security Issue Decision. *Journal of Financial Economics* 42, 159–185.

Kester, C. W. (1986) Capital and Ownership Structure: A Comparison of United States and Japanese Manufacturing Corporations. *Financial Management* 15, 97–113.

Komera, S. and P. J. J. Lukose (2014) Capital Structure Choice, Information Asymmetry, and Debt Capacity: Evidence from India. *Journal of Economics and Finance*, Article in Press.

Kraus, A. and R. H. Litzenberger (1973) A State-Preference Model of Optimal Financial Leverage. *Journal of Finance*, 911–922.

Kremp, E. E. S. and D. Gerdesmeier (1999) Estimation of a Debt Function: Evidence from French and German Firm Panel Data. In A. Sauvé and M. Scheuer (eds.) Corporate Finance in Germany and France. A Joint Research Project of Deutsche Bundesbank and the Banque de France. (SSRN Working Paper).

La Porta, R., F. Lopez-de-Salianes, A. Shleifer, and R. W. Vishny (2002) Investors Protection and Corporate Valuation. *Journal of Finance* 57, 1147–1170.

Leary, M. T. and M. R. Roberts (2007) The Pecking Order, Debt Capacity, and Information Asymmetry. University of Pennsylvania. (Working Paper).

Lemmon, M. L. and J. F. Zender (2004) Debt Capacity and Tests of Capital Structure Theories. (Working Paper).

Marsh, P. (1982) The Choice between Debt and Equity: An Empirical Study. *Journal of Finance* 37, 121–144.

Michaelas, N., F. Chittenden, and P. Poutziouris (1999) Financial Policy and Capital Structure Choice in UK SMEs: Empirical Evidence from Company Panel Data. *Small Business Economics* 12, 113–130.

Mira, F. S. and J. L. Gracia (2003) Pecking Order Versus Trade Off: An Empirical Approach to the Small and Medium Enterprise Capital Structure. *Instituto Valenciano de Investigaciones Economicas*, 1–36.

Modigliani, F. and M. Miller (1958) The Cost of Capital, Corporation Finance and the Theory of Investment. *American Economic Review* 48, 261–297.

Myers, S. C. (1984) Capital Structure Puzzle. 1548–1584. (NBER Working Paper Series, w1393).

Myers, S. C. (2001) Capital Structure. *The Journal of Economic Perspectives* 15, 81–102.

Myers, S. C. and N. S. Majluf (1984) Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have. *Journal of Financial Economics* 13, 187–221.

Nadeem, S. and Z. Wang (2010) Financing Behaviour of Textile Firms in Pakistan. *International Journal of Innovation, Management and Technology* 1:2.

Ozkan, A. (2001) Determinants of Capital Structure and Adjustment to Long Run Target: Evidence from UK Company Panel Data. *Journal of Business Finance and Accounting* 28:1-2, 175–198.

Qureshi, M. A. (2009) Does Pecking Order Theory Explain Leverage Behaviour in Pakistan? *Applied Financial Economics* 19:17, 1365–1370.

Qureshi, M. A. (2010) Testing Pecking Order Theory and Trade-off Theory—A System Dynamics Approach. Paper presented at the 28th International Conference of the System Dynamics Society, Seoul, Korea.

Rajan, R. G. and L. Zingales (1995) What Do We Know about Capital Structure? Some Evidence from International Data. *Journal of Finance* 50, 1421–1460.

Saunders, M., P. Lewis, and A. Thornhill (2003) *Research Methods for Business Students.* Financial Times Press.

Seifert, B. and H. Gonenc (2008a) The International Evidence on the Pecking Order Hypothesis. *Journal of Multinational Financial Management* 18:3, 244–266.

Seifert, B. and H. Gonenc (2008b) Pecking Order Behaviour in Emerging Markets. Old Dominion University, United States. (Working Paper).

Serrasqueiro, Z. and P. M. Nunes (2010) Are Trade-off and Pecking Order Theories Mutually Exclusive in Explaining Capital Structure Decisions? *African Journal of Business Management* 11, 2216–2230.

Shah, A. and S. Khan (2007) Determinants of Capital Structure: Evidence from Pakistani Panel Data. *International Review of Business Research Papers* 3:4, 265–282.

Shyam-Sunder, L. and S. C. Myers (1999) Testing Static Tradeoff Against Pecking Order Models of Capital Structure. *Journal of Financial Economics* 51, 219–244.

Sinan, A. (2010) How Do Firm Characteristics Affects Capital Structure? Some UK Evidence. (MPRA Paper No. 29657).

Strebulaev, I. A. (2007) Do Tests of Capital Structure Theory Mean What They Say? *Journal of Finance* 62, 1747–1788.

Swinnen, S., W. Voordeckers, and S. Vandemaele (2005) Capital Structure in SMEs: Pecking Order versus Static Trade-Off, Bounded Rationality and the Behavioural Principle. Paper presented at the European Financial Management Association.

Tariq, Y. Bin and Z. Abbas (2013) Compliance and Multidimensional Firm Performance: Evaluating the Efficacy of Rule-based Code of Corporate Governance. *Economic Modelling* 35, 565–575.

Titman, S. and R. Wessels (1988) The Determinants of Capital Structure Choice. *Journal of Finance* 43, 1–19.

Tong, G. and C. J. Green (2005) Pecking Order or Trade-off Hypothesis? Evidence on the Capital Structure of Chinese Companies. *Applied Economics* 37:19, 2179–2189.

Ullah, F., Q. Abbas, and S. Akbar (2009) The Relevance of Pecking Order Hypothesis for the Financing of Computer Software and Biotechnology Small Firms: Some UK Evidence. *International Entrepreneurship and Management Journal* 6:3, 301–315.

Vasiliou, D., N. Eriotis, and N. Daskalakis (2009) Testing the Pecking Order Theory: The Importance of Methodology. *Qualitative Research in Financial Markets* 1:2, 85–96.

Vilasuso, J. and A. Minkler (2001) Agency Costs, Asset Specificity, and the Capital Structure of the Firm. *Journal of Economic Behaviour and Organisation* 44, 55–69.

Watson, R. and N. Wilson (2002) Small and Medium Size Enterprise Financing: A Note on Some of the Empirical Implications of a Pecking Order. *Journal of Business Finance and Accounting* 29, 557–578.

Yin, R. K. (2003) *Case Study Research, Design and Methods.* California: Sega Publications.