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Achieving the Optimal Capital Structure and its Impact on Pakistani Banking Performance

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The purpose of this research paper is to identify the relationship between leverage and profit efficiency and market value of the Pakistani banking sector. In this paper the profit efficiency of the bank is used as measure of reducing agency cost and equity capital ratio as the inverse measure of the leverage. The results of this paper show that high leverage or low equity to total assets is associated with high profit efficiency and high market value. The bank size is negatively related to the bank performance. Furthermore there is a unique relationship is being seen between market value index and leverage.

Keywords: Capital Structure, Agency Cost, Tobin's Q, Return on equity, Pakistan.

Field of Research: Banking and Finance

1. Introduction

Mostly firms hire people to manage their business in a professional way. These people are known as agents of the firm as they work on behalf of the shareholders. This agency can be expensive to the firm as when manager expands business in a way that pursues their own interest rather than organization interest.

In the professionally managed firm, when the ownership of the firm is separate from the control then managers tends to exert little efforts in those organizational processes that maximize shareholders value and more focused towards those outputs that pursue or fulfill their own preferences and hence failing to increase shareholders value. In effect, the agency cost is equal the lost value of the firm that is because of professional managers maximizing their own utility. Theory suggests that the careful choice of capital structure may decreases the agency cost.

According to the agency-cost hypothesis the high leverage or low equity to asset ratio decreases the agency cost of outside equity and increases the value of the firm. The agency cost will increase because of presence of free cash flow as manager has resources to pursue their own interest rather than firm's interest.

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In this case the leverage or debt is being used as the controlling device as the creation of debt reduces the free cash flow and also reduces the amount available to managers and moreover the debt also contractually bound the managers to pay interest on the debt and hence reduces free cash flow.

Modgliani and Miller (1958) prove the invariance in the value of firm by changing the capital structure in the perfect conditions. After the M-M theorem a variety of literature on the application of agency theory on capital structure is being developed. Harris and Raviv (1991) and Myers (2001) analyzed that higher financial leverage is positively correlated to firm value and high leverage increases the obligation to manager.

Lev (1974) claimed that firms that are highly leveraged tend to shows greater stock return variance that any other unlevered of less levered firm. The reason for such behavior may be because higher risk, that will be adjusted in the returns of the stock market. As the increase in the leverage increases the risk of the firm and hence increases the variance in the stock market returns.

Higher leverage has great contribution in the conflict reduction between manager and shareholders in choice of investment (Myers, 1977), risk bearing (Jensen and Meckling, 1976), and liquidation condition (Stulz, 1990). These conflict reductions are due the similarity of concern of both parties and thus leads to lower agency cost. Apparently, the agency cost of the banks are larger than the other non financial firm as the banks have more secret information about the customers that need not to be leaked and furthermore the regulators like state bank has set the minimum equity capital in order to restrict the bank from incorporating excessive risk. As the banks provide loan and credit to non financial firms and also responsible for transmitting the effect of the monetary policy and provide stability to the economy, so the importance of all these issues lead the researchers like (Berger and Di Patti, 2003) to examine the agency cost of the banks.

The study of Berger and Di Patti (2003) examine the presence of agency cost in the banks of U.S. In this paper we would analyze the presence of agency cost in Pakistan using the model of Berger and Di Patti (2003) with small modifications. The purpose of this research paper is to identify the relationship between profit efficiency and leverage i.e. nature of change in profit efficiency due to leverage. Tobin's Q is the representative of the market value, so this paper also identifies the impact of leverage on the firm value. Risk associated with the earnings is known as earning risk, is also included in the model. So this paper also analyzes the relationship of risk and leverage in the capital structure.

This paper is segregated as follow: Section 2 presents the capital structure theory and also indentifies the previous work that has been done on this topic. Section 3 explains the data and variables that is being used for the analysis, Section 4 derives the model that estimate the variables and test the hypothesis, Section 5 shows the

results of the estimation and discussion on the results, Section 6 will conclude the results keeping in view of the previous literature.

2. Literature Survey

The study of optimal capital structure of banks has an important implication in Pakistan as in past few years banking industry in Pakistan and grown rapidly and people and institutions take loans and credits from banks. Moreover at present the banking sector is the highest trading sector in the stock market. So studying how to increase bank value and profit is important concern of all the stockholders of banks. Furthermore the banks are the ultimate ways of transmitting the monetary policy effect in the economy so optimizing the bank would result in clear transmission of effect of monetary policy to the economy.

Several studies are being conducted on the achieving optimal capital structure through reducing agency cost and its impact on risk and on bank performance in developed countries. But very little amount of research is being conducted in developing countries on such topic especially in Pakistan. This paper is generally focused on achieving optimal capital structure by reducing agency cost and its impact on performance of Pakistan banking sector.

The characteristics of capital structure were first demonstrated by Modigliani and Miller (1958). They argued that in the absence of transaction and other fixed cost the firm value is insensitive to the capital structure of the firm. In other words, change in the capital structure had no apparent effect on the value of the firm and thus can be changed at any time. After that various researches has been conducted which leads to the introduction of the agency cost and its impact on capital structure.

Research on agency cost and its impact on capital structure was investigated by Jensen and Meckling (1976). In this paper they had introduced the concept of “separation of ownership and control” and also pointed out the conflict that exist between owners and manager and as a result of which agency cost increases (Jensen and Meckling, 1976).

Berger and Di Patti (2002) examined the relationship between agency cost and firm performance under agency cost hypothesis and their findings are consistent with agency cost hypothesis. In this paper Berger and Di Patti applied the simultaneous equation model on the data of 7320 US Bank from 1990 to 1995. Their findings were consistent with Stigler (1976) and Berger and Mester (1997). Islamic banks of Malaysia are also consistent with the agency cost hypothesis and size of the bank was negatively correlated with the bank’s performance (Pratomo and Ismail, 2006). According to Pratomo and Ismail (2007), high leverage lead to low agency cost and hence increases efficiency. They used the data of five Malaysian Islamic bank from 1997 to 2004 and analyzed it using the model of Berger and Di Patti (2002). There is also a unique finding that is being seen is that size of the bank is negatively related to bank’s performance (Pratomo and Ismail, 2007).

According to Shleifer and Vishny (1986), the more the block ownership is diverted to the outside or institutional holdings the more efficiently the manager is monitored, as the managers are liable to the institution holdings and outside ownership. Higher inside ownership reduces agency cost at certain level after that the effect will be reversed at high level of inside holding as insiders become the major partner and accountability is in their own hand and perceive it to be less monitored by the outside. Stulz (1990) argued that giving managers a huge share of the firm reduces the firm value. There was a non linear exist between ownership of managers and firm value. According to him the firm value increases as the manager share in the ownership increase. But when the ownership of the manager reaches to 50% o above the majority of owner and additional transfer of ownership to manager have no impact on the firm value.

According to Harris and Raviv (1990), debt instrument in the capital structure allows investor to discipline management by reducing the discretionary power of the management on free cash flow of the firm (Jensen, 1986) and also accumulate information about firm's future prospects. The investor can use this information in making decision about whether to liquidate the business and or continue to operate (Harris and Raviv, 1990).

Berger and De Young (1997) discovered the intertemporal relationship between loan quality, efficiency and bank capital using the Granger Causality technique. They used the data of U.S. commercial banks from 1985 to 1994. They was also of the view that cost inefficient bank may tend to have high loan problems and bad quality loan.

Berger (1995) investigated that there was a positive relationship between capital asset ratio and earnings of the bank. Berger investigated the results by applying Granger Causality model on the data of US Banks from 1983 to 1989. The results of Berger (1995) were contradictory with the conventional understanding of the relationship between earning and capital. The conventional point explains the negative relationship between capital and earnings, as higher capital reduces the risk and hence decreases the return on equity (Berger, 1995). According to Keelay and Furlong (1990), the value maximizing banks always deal with increasing the firm value and their desired portfolio risk was sensitive to the increase in the capital of the banks. The behavior of the banks is different with different risks. Researchers have identified the safer banks tends to do more commitments i.e. is guarantees or unsecured debts (Benveniste and Berger, 1987), and riskier banks tends to give more stand by i.e. is more secured debts (Berger and Udell, 1993).

Sauders, Strock and Travlos (1990) estimated the linear relationship between ownership and the choice of risk. Sauder, Strock and Travlos examined 38 US Banks using the eight different parameters of the risk and found that stockholder controlled banks tends to take more risk as compared to managerially controlled bank. McConnell and Servaes (1990) evidenced that quadratic relationship between Tobin'Q and insider and outsider holdings. Its means that Tobin's Q value rise first

and then decline as the excess holdings on each sides leads to their cost more than their benefits to the non financial firm.

From the above literature analysis it is clear that capital structure performance can be improved by reducing the agency cost as agency cost is the major player in achieving the optimality of capital structure. Similarly it is also seen that shareholders managed firm are more willing to take risk than managerial controlled one. This study has an important contribution in the economy as the banks and other financial institutions are the sole transmitter of monetary policy in the economy and also responsible for the stability of the economy. Hence with the presence of the agency cost the transmission of monetary policy is not transparent as in such case it also includes the other cost associated with it. As the funds are channeled by the bank so lack of maximizing value of bank put pressure on the prices of loan and credits. That's why optimizing banks have important implication in the economy.

3. Hypothesis

H_{10}: No relationship between leverage and efficiency = $\partial EFF/\partial ECAP = 0$
H_{11}: increase in leverage raises efficiency = $\partial EFF/\partial ECAP < 0$

H_{20}: There is no relationship between efficiency and bank risk = $\partial EFF/ \sigma ROE = 0$
H_{21}: The more riskier the bank is the more profit efficient bank will be = $\partial EFF/\sigma ROE > 0$

H_{30}: No relationship between leverage and Value = ∂Tobin's Q/$\partial ECAP = 0$
H_{31}: increase in leverage raises Value = ∂Tobin's Q/$\partial ECAP < 0$

4. Data and Variables

For this research paper the eight years data of all listed Pakistani bank is being taken that are 25 in number and the duration of data is from 2002 to 2009. The bank should be listed in stock market because market value of the bank is needed for the analysis and listed bank market value can easily be calculated through share price. The sources of data are annual reports and Karachi stock exchange. The data from last eight years is being collected from the previous annual report of the banks for every year. The variables that are included and also suggested by the literature are the bank efficiency which is dependent variable. The independent variables are Leverage ratio, Earnings, risk, Size, Bank investments, and loans (Berger and Di Patti, 2002, Harris and Raviv, 1990).

5. Methodology

In this paper we follow the Berger and Di Patti (2002) and Pratomo and Ismail (2007) that relates the profit efficiency and capital structure. The model is estimated using two approaches one is the profit efficiency i.e. is value maximization and other is wealth maximization.

$$EFF = f(ECAP, SDROE, LOAN, SIZE, HERF, SEC)_{it}$$

$$Tobin's\ Q = f(ECAP, SDROE, LOAN, SIZE, HERF, SEC)_{it}$$

Where EFF_{it} is a measure of bank profit efficiency, Tobin's Q is the measure of market efficiency, $ECAP_{it}$ is the ratio of equity capital to total asset, $SDROE_{it}$ is the standard deviation of ROE, $SIZE_{it}$ is the Dummy variable of the firm size, $LOAN_{it}$ is the total loan that is delivered by the bank, SEC_{it} is the Bank's investment in securities, $HERF_{it}$ is the measure of local market concentration. Tobin's Q is the measure of Market value. Where I = 1, 2, 3, ….nth banks and t = time or sample duration.

In the above model the EFF is the measure of Profit efficiency which is based on the Profit maximization concept and Tobin's Q is the measure of market value of the firm which is used as the basis for wealth maximization measure. So the first model is based on the profit maximization concept and other model is based on wealth maximization concept. These model gives the comprehensive clarification of whether the whether the Pakistani banks are consistent with agency cost hypothesis or not, as they analyze the existence of agency cost on both levels i.e. profit level and market level. This model differs from the Berger (1995) in number of ways as Berger (2002) used the simultaneous equation model for the analysis and furthermore Tobin's Q is not incorporated in that model. So in this study, Tobin's Q is incorporated as the measure of the market value maximization.

The variables of the above equation are measured as follow;

5.1. Firm Performance (EFF and Tobin's Q)

There are different measures of the firm performance suggested by the literature. Gorton and Rosen (1995) used the financial ratios for the measurement of firm performance. Saunders, Strock, and Travlos (1990) used stock return as the measure of firm performance, Morck, Shleifer, and Vishny (1988) used the Tobin's Q as the measure of firm performance.

In this analysis, two performance measures are used in which one indicate the firm's performance based on profitability. This measure is the profit efficiency measure and is equal to the return on equity of the firm as the return on equity is also the efficiency measure. Berger (1995) argued that profit efficiency measure is superior to cost efficiency measure as it gives information about the efficiency of the manager in raising revenue and also it is the basis of the profit maximization concept.

The other measure is the Tobin's Q, the Tobin's Q is the ratio of market to book value and calculated by dividing the market value to the book value of the bank. Morck, Sheilifer and Vishny (1988) explain that Tobin's Q is the measure of the firm

performance; in this paper they used the Tobin's Q to find the relationship between manager equity ownership and firm value.

5.2. Leverage (ECAP)

According to the agency cost hypothesis the higher leverage or low equity to capital ratio reduces the agency cost. There are several measures that can be used as a proxy of the leverage such as debt to total assets is used as the leverage in non financial firm, Debt to Equity can also be used as leverage measure. In this paper the leverage is calculated by taking the inverse of the equity capital ratio. The equity capital ratio is measured by dividing shareholders equity by total assets.

5.3. Earnings Risk (SDROE)

In this paper earnings risk is the variation in the earnings of the firm. The earning risk of the bank is measured through standard deviation of the return on equity over the time. According to Berger (1995) riskier bank have more profit efficiency as the return on equity is adjusted to the risk associated with the bank. According to Keelay and Furlong (1990) the bank that maximizes their value adjusts their risk of desired portfolio according to the capital structure of the bank. The reason of incorporating earnings risk is to identify the changes in the earning with the change in the capital structure.

5.4. Size

The size is the dummy variable and represents the size of the bank. The value of 1 represents if the size of the banks is greater than 100 billion rupees and 0 if the size of the bank is less than 100 billion rupees. Pratomo and Ismail (2006) reported that size of the bank is negatively related to the bank efficiency, for the analysis they also develop the dummy variable of size for analyzing the relationship of size and bank efficiency.

5.5. Herfindahl Index (HERF)

Herfindahl Index (HI) is a measure of the market power of the bank. Herfindahl index is basically developed to see the efficiency and benefits of the mergers and acquisition in respect of markets gain. In this paper Herfindahl index of local deposits of the bank is being calculated that represents the market power of the bank, in which deposit share represents the share of market of the bank. The Herfindahl index is being calculated as:

$$H = \sum_{i=1}^{N} s_i^2$$

In the above "s" represents the share of deposit of the bank. The value of the Herfidahl index varies from 0 to 1 where greater value leads to high market power and vice versa.

Researchers used the Herfindahl index for examining the horizontal merger, as the Herfindahl identify the gain in the market after merger. According to Porter and Zona, (1999), this HI measure can be used as a concentration index and also helpful in studying the cooperative behavior. Kwoka (1977) argue that HI index incorporate the size with weight according to priority. Literature supports that Herfindahl index is the measure of the concentration in market and also the measure of competitiveness.

5.6. Bank Investments (SEC)

The bank investment variable includes the investment of bank in different securities. It includes all the investments that the bank has made in either stock or in fixed income securities or in both. It is obvious that bank investment portfolio is directly related to the bank efficiency as higher the returns from the investment portfolio, higher will be the profit. Berger (1995) has incorporated the investment variable in segregated way to see the effect and relationship of different securities with the bank efficiency.

5.7. Loan

The loan variable includes all the loans made by the bank. It includes consumer loans, corporate loans, business loans and other credits. According to Benveniste and Berger (1987) the safer bank or the bank with good credit rating tends to issue more guarantees or unsecured debts. But riskier bank tends to give more secured debts (James, 1989). Loans and profit or market value efficiency relationship depends on the loan quality. Berger and De Young (1997) evidence the intertemporal relationship between loan quality and bank efficiency.

6. Empirical Results

The relation among bank efficiency and leverage, earning risk, loan, investment and size is being estimated using the cross sectional time series regressions for 25 banks over period of 2002 to 2009. In this paper we follow the Berger and Di Patti (2002) that relates the profit efficiency and capital structure. The model is estimated using two approaches one is the profit efficiency i.e. is value maximization and other is wealth maximization for which we use Tobin's Q. the models are,

$$EFF = f(ECAP, SDROE, LOAN, SIZE, HERF, SEC)_{it}$$
$$Tobin's\ Q = f(ECAP, SDROE, LOAN, SIZE, HERF, SEC)_{it}$$

Where as

$$HERF = f(S)_{it}$$

And

$$Tobin's\ Q = f(Stock\ prices, Book\ value)$$

In this paper there are two dependent variables. One shows the profit efficiency and other shows the market efficiency through these models. The comprehensive view of

leverage can be analyzed on both side i.e. market efficiency and profit. So the models are,

Value Maximization

$$EFF_{it} = \alpha + \beta_1 ECAP_{it} + \beta_2 1/2ECAP^2_{it} + \beta_3 SDROE_{it} + \beta_4 1/2SDROE^2_{it} + \beta_5 SIZE_{it} + \beta_6 LOAN_{it} + \beta_7 SEC_{it} + \beta_8 HERF_{it} + \varepsilon_{it}$$

Wealth Maximization

$$Tobin's\ Q_{it} = \alpha + \beta_1 ECAP_{it} + \beta_2 1/2ECAP^2_{it} + \beta_3 SDROE_{it} + \beta_4 1/2SDROE^2_{it} + \beta_5 SIZE_{it} + \beta_6 LOAN_{it} + \beta_7 SEC_{it} + \beta_8 HERF_{it} + \varepsilon_{it}$$

where
EFF_{it} = measure of bank profit efficiency
$ECAP_{it}$ = ratio of equity capital to total asset
$SDROE_{it}$ = standard deviation of ROE
$SIZE_{it}$ = Dummy variable of the firm size
$LOAN_{it}$ = total loan that I delivered by the bank
SEC_{it} = Bank's investment in securities
$HERF_{it}$ = measure of local market concentration

The reason for using the half squared value of the ECAP is that high leverage tends to have high efficiency but this relationship remains like that until the agency cost benefits are more than cost of debt and after that there is a decline in value due to high cost of debt compared to agency cost. Similar is the case with SDROE as it not always increases some poorly operating banks have poor risk management furthermore the concept of standard deviation is based on the normal distribution, and standard deviation measures the variation on both sides either positive or negative, so due to these reasons the half squared value is used to incorporate such variation in the model.

6.1. Unit Root Test

For the estimation first the unit root test is being conducted to find the whether the data is stationary or not. The presence of non stationary variable leads to the amplified results of R^2 and t-statistics that would lead to the less accuracy of the estimation. The non stationary data means some part of each value of the series is dependent on the previous value and due to which each value has an impact of previous value and that distort the results. For the cross sectional panel data we use Levin, Lin and Chu test and Im, Pesaran & Shim W test for the unit root analysis.

Table I: (Unit Root test)

Variables	Level		1st Difference	
	Lev Lin & Chu	Im Pesaran & Shin W	Lev Lin & Chu	Im Pesaran & Shin W
ROE	-17.108*	-2.084**	6.1111	-1.235
ECAP	-5.764*	0.27	-18.745*	-4.877*
SDROE	-15.387*	-5.151*		
SIZE	-2.65*	0.577		
LOAN	-29.566*	-0.557	-27.517*	-6.156*
SEC	-2.261**	2.961	-14.5634*	-5.405*
HERF	-10.908*	-1.925**	-5.126*	-2.450*
Tobin's Q	-5.701*	-0.277	-6.763*	-1.567

- **** Significance at 1% level***
- ***** Significance at 5% level***

The Table I shows the results of the unit root test. From the results of the unit root, it is seen that almost all the variables stationary i.e. p< 0.05, or p< 0.01, hence rejecting the null hypothesis which states that data has non stationary variable or unit root at level. In lev Lin & Chu test all are stationary at first level at significance level of 1%. But Im Pesaran and Shin W has the non-stationary variable or unit as it has p-value greater than 0.05, hence accepting the null hypothesis that data has unit root at level but at first difference the data is stationary at 1% significance level. In Table I the row of SDROE and SIZE is empty because the unit root at first difference is not applicable to dummy variables and SIZE is the dummy variable in this model. SDROE is the standard deviation measure of ROE, so its first difference is not possible as it already represents that change in the value. As there are some variables that show the presence of unit root in Im Pesaran and Shin W, but they can significance at 10% significance level. The estimation is done using fixed effect, random effect and OLS estimation.

The fixed effect model is used when the data is both time series and cross sectional. In such case when we talk about fixed it means that we impose the time independent effect on each quantity. The fixed effect assumption is that the individual specific effect is correlated with the independent variables. So to get rid of the individual effect the differencing of the individual value with mean value is used for the analysis
The random effect is also used when the data is time series and cross sectional but the data is uncorrelated with previous value. The random effects assumption is that the individual specific effects are uncorrelated with the independent variables. If the random effects assumption holds, the random effects model is more efficient than the fixed effects model. However, if this assumption does not hold (i.e. if the Durbin-Wu test fails), the random effects model is not consistent.

Different researcher has used these models. Kiviet (1995) has used fixed effect model for the analysis of panel data. Similarly Andersen and Hsiao (1981) also used

the fixed effect model with the small modification in it. So it means that fixed effect and random effect model are used for the analysis of panel data.

6.2. Profit Maximization

In the first model the profit efficiency which is represented by ROE is taken as independent variable and all other are taken as independent variables. Some variables are quadratic in nature so the square term of them is also incorporated in the analysis.

Table II: Estimation Using Profit Efficiency

Dependent Variable: ROE (Profit Efficiency)

Variables	***OLS***		***Fixed***		***Random***	
	Co-eff	***t-Stat***	***Co-eff***	***t-Stat***	***Co-eff***	***t- Stat***
Constant (α)	0.329	2.767*	1.035	8.141*	1.158	2.42**
ECAP (β_1)	-2.315	-2.617*	-1.223	-4.279*	-1.555	-4.411*
½ ECAP (β_2)	2.152	2.560	1.782	2.491	1.810	3.55*
SDROE (β_3)	-0.808	-3.418*	-1.382	-6.151*	-1.773	-4.028*
½ SDROE (β_4)	0.532	10.632*	0.5487	-1.926**	.0965	0.219
SIZE (β_5)	-0.108	-0.989*	-0.0298	-1.195**	-0.125	-2.359**
LOAN (β_6)	0.0000082	1.042	0.000022	0.813	0.0000019	0.293
SEC (β_7)	0.000014	0.782	-0.00007	-1.587	0.0000063	0.402
HERF (β_8)	-4.128	-0.628	-10.959	-1.486	-22.991	-1.936
R^2	0.885		0.838		0.31	
Adjusted R^2	0.878		0.796		0.274	
F-Stat	141.49*		20.011*		8.326*	
DW	1.619		1.73		1.311	

- **** Significant at 1% level***
- ***** Significant at 5% level***

Table II represents the estimation result of first model. The estimation is done using OLS, fixed and random effect. The result shows the inverse relationship between ECAP and profit efficiency has negative relationship and t-stats shows the significance i.e. $p< 0.05$, which shows that there exist negative relationship between equity to assets ratio and profit efficiency. There is also negative relationship

between SDROE and profit efficiency and also result is significant as p<0.05. The notion behind it is that higher efficiency substitute the equity capital and protects the bank from Bankruptcy and financial distress. The R^2 value is high showing 88% dependency on independent variables. The F-Stat shows that the model is significant i.e. p<0.05 and model fits the data well. The DW measure is crude in this case because DW has drawback of not incorporating second degree analysis. The DW condition does not hold as DW measure is failed for random model and become in consistent. So fixed effect model or OLS will be considered. The results of fixed effect and OLS are almost same. It only differs in random effect model which become inconsistent.

Table III: (Housman Test)

Hausman Test		
	Chi Square	*p- Value*
Random	33.564	0.0054*

- **** Signficance at 1% level***
- ***** Significance at 5% level***

The Hauseman test is used to evaluate the significance of estimator and significance of the alternative model estimator. Hausman test is based on the null hypothesis that random effect and fixed effect estimators are same. In the above analysis the p-value shows that random effect estimators and fixed effect estimators have substantial different results (p < 0.05). This result is consistent with our estimation findings as the DW has already predicted the inconsistency in fixed effect and random effect model as the random effect model is inconsistent so OLS and fixed effect has same estimates.

6.3. Wealth Maximization

In the second model the market value efficiency measure i.e. Tobin'Q is being used as the dependent variable instead of profit efficiency variable. All other independent variables are same as that of profit efficiency model.

The Table IV shows the estimation of the second model with dependent variable Tobin's Q. the show that there is a negative relationship between equity capital ratio and Tobin's q but the significance of it is has less confidence level as its significant at p< 0.20. There is negative and significant relationship between variations in ROE with Tobin's Q (p < 0.01), which is also in support to literature. The size of the bank is positively related to the Tobin's Q and relationship between them is significant at 1% level. Loan also has significant positive relationship with Tobin's Q. all these model show the same type of results and direction among variable. Apparently it can be said as there is no difference in results of three models.

Table IV: Estimation Using Profit Efficiency

Dependent Variable: Tobin's Q

Variables	***OLS***		***Fixed***		***Random***	
	Co-eff	***t-Stat***	***Co-eff***	***t-Stat***	***Co-eff***	***t- Stat***
Constant (α)	1.750	5.431*	5.330	4.030*-	2.882	2.61*
ECAP (β_1)	-2.595	-1.531	-2.484	1.143**	-1.410	-0.225
½ ECAP (β_2)	4.197	2.771	11.19	2.120**	1.533	0.24
SDROE (β_3)	-1.481	-2.701*	-3.459	-3.479*	-6.004	-0.368*
½ SDROE (β_4)	0.300	2.758	0.291	1.931**	1.158	3.363*
SIZE (β_5)	1.339	3.557*	0.770	1.910	0.721	0.804
LOAN (β_6)	0.0026	3.345*	.00086	1.459	0.000038	4.742*
SEC (β_7)	-0.000025	-1.361	-2.73	-1.153	-0.000026	-0.642
HERF (β_8)	84.374	0.845	-255.185	-1.460	-51.838	-0.514
R^2	0.448		0.62		0.197	
Adjusted R^2	0.418		0.52		0.153	
F-Stat	14.927*		6.432*		4.513*	
DW	1.68		1.504		1.712	

- **** Significant at 1% level***
- ***** Significant at 5% level***

In Table IV the value of R^2 is 44% which shows percentage of dependency of dependent variable on independent variable. The F-stat is significant at $p < 0.01$ showing the data fits well and model is significant. In overall it can be seen that random model shows a week statistics as compared to other two models, but show the same nature of results as that of other two model. The squared variables have the positive relationship showing the per unit amount change in variation leads to how much change in the market Tobin's Q. From the results it is seen that the results support the hypothesis, i.e. Tobin Q and equity capital ratio has negative relationship and thus low equity capital ratio leads to high Tobin' Q, which is the measure of the market efficiency.

Table V: (Housman Test)

Hausman Test		
	Chi Square	*p- Value*
Random	11.354	.1824

- **** Signficance at 1% level***
- ***** Significance at 5% level***

The Table shows the Hausman test results and according to statistics the Housman test accepts the null hypothesis as $p > 0.05$. The null hypothesis states that there is

no difference between the estimates of fixed effect and random effect model. This can also been seeing that each model predict the same type of relationship among variables.

7. Conclusion

In this paper agency cost hypothesis is being tested on the banking sector of Pakistan. The agency cost hypothesis states that the high leverage or low equity to capital ratio reduces the agency cost of the firm and hence increases the value of the firm. The high leverage restricts or bound the managers to act in the interest of shareholders, moreover due to leverage the manager loses some control on free cash flow of the firm that leads to the less agency cost.

In this paper we used the two measures that represent the value of the firm, one is profit efficiency that is based on the rules of profit maximization and other is Tobin's Q based on the market value of the firm. For the analysis we used the panel data of eight years of banking sector of Pakistan. For estimation we used random effect model, fixed effect model and simple OLS estimation. Hausman test is being conducted for identifying the estimates differences.

The result from the estimation shows a significant relationship between profit efficiency and equity capital ratio, which means that the results are consistent with agency cost hypothesis. These results are similar to results of Berger (1995) and Harris and Ravivi (1991). Our first hypothesis with states that there is no relationship between return on equity and equity capital ratio is being rejected and it is found that there is negative significant relationship exist between return on equity and equity capital ratio. The second null hypothesis which states that there is no relationship between profit efficiency and earnings risk is also rejected and estimates showed that there is a negative relationship exists between profit efficiency and earnings risk. The logic behind this relationship is that high earning reduces the risk of bankruptcy. The third hypothesis states that there is no relationship between Tobin's Q and equity capital ratio. This hypothec showed the significance but at very high level i.e. $p < 0.20$ that means that here is 80% confidence level and that level is quite low. But the estimates show the negative relationship between Tobin's Q and equity capital ratio.
There are also some limitations that are involved in it such as the data is taken from annual reports which are most of the time window dressed and does give accurate figures. Some changes in the figures are due to stat bank policies changes overtime but these changes cannot be incorporated due to limitation of the data. Future research can extend this analysis as there are many different measure of leverage so this research can be done using other variables of leverage and risk, furthermore this research can be extended to non-financial sectors of Pakistan.

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