The Effect of Capital Structure on the Performance of Palestinian Financial Institutions

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Abstract

This study aims at finding the relationship between the market efficiency and capital structure of Palestinian financial institutions. The study establishes a model to measure the effect of capital structure on the bank efficiency measured by ROE, ROA, Total deposit to assets, total loans to assets and total loans to deposits were used to measure capital structure. It is found that leverage has a negative effect on bank profits, an increase in each ROA and Total Deposit to Assets increase bank efficiency. We also tested the effect of the above variables on bank market value measured by Tobin's Q. It was also found that Leverage has a negative effect on market value of the bank, a positive and strong relationship between market value and ROA and bank deposits to total deposits.

Keywords: Return on Assets, Return on Equity, Total Deposit to Assets, Loans to Total Deposits, Loans to Total Assets, Tobin's Q.

1. Introduction:

Capital structure theory was introduced first by Modigliani and Miller in 1958 who examined the firm's value changes through changing its capital structure Modigliani and Miller (1958, 1963). After that several hundreds of papers were written investigating the subject and trying to find the effect of capital structure on corporate performance. Very few found a negative relationship such as: Deesomask et.al. (2004); Huang and Sang(2006); Tang and Jang(2007); Ebaid (2009); Karadeniz et. al.(2009) and Chakraborty (2010), while most studies found a positive relationship between capital structure and firm's performance such as: Ghosh et.al.(2000); Hadlock and James (2002); Frank and Goyal (2003), Berger and Bonaccorsi (2006) among others.

Banks and financial institutions play a vital role in the economy through their financial intermediation and the transmission mechanism of monetary policy and in providing economic stability. The later was very obvious in the last financial crisis in the USA and Europe. The agency cost appeared to be as important as that of the non financial firms which brought the attention to investigate the agency problem in the banking industry in the late decade of the twentieth century. One of the most important writers about the subject was Allen Burger from the Federal Reserve System through several articles, see for example: Burger (1995), Burger and DeYoung(1997), Berger, Herring and Szego (1995), Berger and Mester(1997), and Berger and di Patti(2002). Their writings inspired several articles on the subject during the last 10 years, but none have examined the effect of agency problem on Arab banks.
Abu Rub (2012) investigated the impact of capital structure on non-financial firms’ performance. The study used panel data procedure for a sample of 28 listed companies on the Palestinian Securities Exchange (PSE) over the period of 2006-2010. The results showed that firm’s capital structure had a positive impact on the firm’s performance measures, in both the accounting and market’s measures. The objective of this paper is to examine the effect of capital structure on Palestinian Financial Institutions. The sample will be limited to those banks listed on the Palestinian Securities Exchange (8 banks). A model will be built to examine the effect of capital structure on profitability using return on asset and return on equity as a measure of accounting efficiency, and Tobin’s Q test to measure market efficiency through wealth maximization. The rest of the paper is organized as follows: section II reviews the literature on the subject, Section III outlines the model, section IV reviews the data collected on the variables of the model, Section V empirical results of the model using OLSQ method. And section VI recommendation and conclusion.

2. Literature Review

Several studies examined the agency cost as one of the determinants of capital structure in non-financial firms such as the study of Jensen and Meckling (1976) who find the possible conflict between owners and managers that results in an increasing agency cost. A vast literature on such agency cost theoretic explanation of capital structure has developed such as: Harris and Raviv (1991) and Myers 2001. Some studies incorporated debt in capital structure in terms of tax advantage of debt (Miller 1977). Booth et.al.(2001) examined the effect of debt on tax in some developing countries and found that debt ratio is negatively related to tax rate. While Antoniou et.al.(2002) found a mixed results when they used data from European countries in their study. Some others used debt as signal for quality firms management, Leland and Pyle 1976 and Ross 1977, while others used debt as an anti-takeover device Harris and Raviv (1990).

The effect of capital structure of financial institutions was first made by Berger who found a positive relationship between capital asset ratio and earnings of the bank. This was contradicting with the conventional relationship between earnings and capital, as higher capital reduces the return on equity (Berger 1995). In testing bank efficiency, Berger and DeYoung (1997) found that there is an inter temporal relationship between quality of loans; efficiency and bank capital. They concluded that cost inefficient banks tend to have high loan problems and bad quality loans. In examining the relationship Tobin's Q and insider and outsider holdings, McConnell and Servaes (1990) found that Tobin's Q increase then decrease as the excess holdings on each side lead their cost to increase more than their benefits to the non-financial firms.

In comparing banks to non-financial firms it is found that banks are highly levered. Flannery(1994) found that banks are influenced by debt in the same way as any other firms, yet they operate with unusually high leverage. U.S. banks in 1990 had a 6.5% ratio of equity to asset compared to a capital ratio of 55% for non-financial firms. This is normal if we know that financial firms are providers of loans and is not mechanically linked to their role as deposit takers. Deposit-taking financial institutions have substantial liabilities over and above their deposit base in the form of subordinated debt. U.S. banks non-deposit liabilities (commercial notes and bonds) accounted for 26.5% of their total liabilities in 2002 Saunders and Cornett(2003).

Since banks' function is to make loans in competitive environment, financial institutions should have higher leverage than non-financial institutions Inderst and Mueller (2008). The functional approach to banks' capital structure was also addressed by Diamond and Rajan (2000) who argued that to really understand the determinants of bank capital structure should start by modeling the essential functions of banks' performance, and then ask what role capital plays. Pratomo and Ismail (2006) tested the agency hypothesis on Malaysian Banks and their findings were consistent with the agency hypothesis. They found that the higher the
leverage (or a lower equity capital ratio) is associated with higher profit efficiency. Another study which agreed with these findings is the one done by Siddiqui and Shoaib (2011) on Pakistani banks and is also consistent with that of Berger and Di Patti (2000). However Random and Effects models proved Modigliani and Miller proposition that capital structure has no effect on the value of banks.

3. Estimation Method

3.1. Data sources:

The banking sector in Palestine consists of 22 banks (commercial, investment and Islamic) of which only 10 are nationals and the rest are branches of foreign banks. So the study will cover 8 out of the 10 banks which are listed on the Palestine Securities Exchange (PSE). So the data used in the study is published by PSE and cover the period of 4 years 2007-2010.

3.2. The Model:

The purpose of the study is to measure the effect of capital structure on the performance of Palestinian Banks. So the study used two measures: Accounting and market measures of performance. The study used one proxy for accounting and one for market value to measure the performance. Most researchers used the proxy Return on Equity (ROE) as accounting performance measure while Tobin’s Q, is used to measure the market performance of the firms.

The independent variables used in both measures are the bank deposits total assets, total bank loans and other investment and net profit. Since there is multicolliniority between some of the independent variables we used the ratios to represent these variables. To determine the impact of the independent variables on the dependent variables the study used Multiple Linear Regression. So our model become as follows:

\[
Y_{roe} = \beta_0 + \beta_1 TDA + \beta_2 ROA + \beta_3 TLD + \beta_4 TLA + \epsilon_i \tag{1}
\]

\[
YQ = \beta_0 + \beta_1 TDA + \beta_2 ROA + \beta_3 TLD + \beta_4 TLA + \epsilon_i \tag{2}
\]

Where

\(Y_{roe}\) is a measure of bank profit efficiency, equal return on equity.\(TDA\) is the ratio of total deposits to total asset (represent the leverage of financial firms), \(ROA\) is the return on assets; \(TLD\) is the total loans that is delivered by the banks divided by the total deposits;\(TLA\) it is the total loans that is delivered by the banks divided by the total assets.

\(YQ\) represents Tobin’s Q is the measure of Market value: it is equal to (market value of equity + book value of deposit) / book value of assets. So the first model is based on the profit maximization concept and other model is based on wealth maximization concept.

\(\epsilon_i\) is a stochastic disturbance.

To complete the specification of the regression model we add the following assumptions:

1. \(\epsilon_i\) is normally distributed
2. \(E(\epsilon_i) = 0\)
3. \(E(\epsilon_i^2) = \sigma^2\)
4. \(E(\epsilon_i \epsilon_j) = 0\) for \(i \neq j\)
5. no exact linear relation exists between any of the explanatory variables.
These models give the comprehensive clarification of whether the Palestine 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 & Di Patti (2002) and that of Gohar & Shoaib (2011) as well as Siddiqui and Shoaib (2011) in that variables used in our model are different from those used in the above three models as well as the estimation method is also different. And we will use multiple regression analyses (OLSQ) to test our model.

3.3. Hypotheses Testing:

In order to investigate the effect of the debt on the firm’s performance the study used eight hypotheses:

3.3.1. H0: No relationship between leverage and efficiency
       H1: increase in leverage raise efficiency

3.3.2. H0: There is no relationship between efficiency and bank loans to deposits
       H1: increase in bank loans raise efficiency

3.3.3. H0: No relationship between bank ROA and efficiency
       H1: increase in ROA raises efficiency

3.3.4. H0: No relationship between Loans to Assets and efficiency
       H1: increase in Loans to Assets raise efficiency

3.3.5. H0: No relationship between Loans to Assets and Market Value
       H1: increase in Loans to Assets raise Market Value

3.3.6. H0: No relationship between bank ROA and Market Value
       H1: increase in ROA raises Market Value

3.3.7. H0: No relationship between Market Value and bank loans to Deposits
       H1: increase in bank loans to deposits raise Market Value

3.3.8. H0: No relationship between loans to Assets and Market Value
       H1: increase in Loans to Assets raise Market Value
4. Empirical Results

4.1. Descriptive Statistics:

The following table provides elementary statistical results about the variables used in the models for all 8 banks.


<table>
<thead>
<tr>
<th></th>
<th>Q</th>
<th>TDA</th>
<th>ROE</th>
<th>ROA</th>
<th>TLA</th>
<th>TLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>2.3700</td>
<td>.6030</td>
<td>.3660</td>
<td>.0570</td>
<td>.3360</td>
<td>.6193</td>
</tr>
<tr>
<td>Minimum</td>
<td>.1160</td>
<td>.2910</td>
<td>-.1360</td>
<td>-.0330</td>
<td>.1420</td>
<td>.1950</td>
</tr>
<tr>
<td>Maximum</td>
<td>2.4860</td>
<td>.8940</td>
<td>.2300</td>
<td>.0240</td>
<td>.4780</td>
<td>.8143</td>
</tr>
<tr>
<td>Mean</td>
<td>.9337</td>
<td>.6563</td>
<td>.0447</td>
<td>.0072</td>
<td>.3109</td>
<td>.4235</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.5939</td>
<td>.2131</td>
<td>.0886</td>
<td>.0120</td>
<td>.0775</td>
<td>.1309</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.6966</td>
<td>-0.5079-</td>
<td>0.2661</td>
<td>-1.6576-</td>
<td>0.3324</td>
<td>0.9694</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>0.5880</td>
<td>-1.4347-</td>
<td>0.5586</td>
<td>3.7977</td>
<td>0.1632</td>
<td>1.2426</td>
</tr>
</tbody>
</table>

The table shows that the average return to equity for the sample as a whole is 0.044 and the average return to assets is 0.0072. which means that accounting measure is better comparing with Market performance, the average values of Tobin’s Q (93%) is less than one which revealed the market value of listed companies in the PSE is less than their book values, this only happens when the market is very weak and most investors are afraid to enter the market. the banks shares are under priced. The average ratio of the total deposits to total assets is about 65%. this ratio is low compared to other countries, the reason for that is the nature of deposits in both Islamic banks and investment banks. The ratio of total loans to total assets and total loans to total deposits are 31% and 42% respectively. they are very low compared to neighboring countries. But the ratio is consistent with the ratio required by the Palestine Monetary Agency.

Table 2 is built according to Person Matrix shows the correlation between the explanatory variables. The results show that there is a very strong positive correlation (70%) between TDA and Q, and strong positive correlation between ROE and Q (53.2). The study shows weak correlation between Loans to total assets and loans to deposits and (Q and ROE) the reason behind that is due to low level of lending in Palestinian banks due to high country risk and conservative banks’ policies. Another thing that the table shows is the existence of a strong positive multicollinearity between loans to assets and loans to deposits 77.4%.
4.2. The correlation matrix

The next table shows the correlation between the variables of the model:

**Table (2)**: Correlation Matrix of the Explanatory Variables, during 2007-2010

<table>
<thead>
<tr>
<th></th>
<th>Q</th>
<th>TDA</th>
<th>ROE</th>
<th>ROA</th>
<th>TLA</th>
<th>TLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TDA</td>
<td>.708**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>.532**</td>
<td>.324</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>.412*</td>
<td>.143</td>
<td>.848**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TLA</td>
<td>.218</td>
<td>.133</td>
<td>.132</td>
<td>.199</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TLD</td>
<td>.088</td>
<td>.235</td>
<td>.269</td>
<td>.374*</td>
<td>.774**</td>
<td>1</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

4.3. Model estimation results

The next table shows the result of estimation of the first equation using OLSQ to estimate the effect of independent variables on the ROE in three different stages:

stage 1: we did the regression on all independent variables
stage 2: we omitted Loans to deposits as we found it not significant
stage 3: we omitted both Loans to Deposits and Loans to Assets as they both are not significant.

The following table shows the result of the regression of the first equation in the three stages:

**Table (3)**: MLR between ROE & Independent Variables.

<table>
<thead>
<tr>
<th>Model</th>
<th>Adjusted R Square</th>
<th>Durbin-Watson</th>
<th>F</th>
<th>Sig.</th>
<th>B</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>stage 1</td>
<td>.748</td>
<td>23.967</td>
<td>.000b</td>
<td>(Constant) -.100</td>
<td>-2.120</td>
<td>.043</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ROA  5.583</td>
<td>7.053</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TDA .131</td>
<td>2.679</td>
<td>.012</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TLA .307</td>
<td>1.517</td>
<td>.141</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TDA .182</td>
<td>1.373</td>
<td>.181</td>
<td></td>
</tr>
<tr>
<td>stage 2</td>
<td>.740</td>
<td>30.389</td>
<td>.000b</td>
<td>(Constant) .080</td>
<td>1.753</td>
<td>.091</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ROA  6.128</td>
<td>8.811</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TDA .089</td>
<td>2.298</td>
<td>.029</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TLA .070</td>
<td>.654</td>
<td>.518</td>
<td></td>
</tr>
<tr>
<td>stage 3</td>
<td>.745</td>
<td>46.252</td>
<td>.000b</td>
<td>(Constant) .055</td>
<td>2.130</td>
<td>.042</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ROA  6.044</td>
<td>8.930</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TDA .086</td>
<td>2.263</td>
<td>.031</td>
<td></td>
</tr>
</tbody>
</table>
Table (3) shows that the study used three stages to get the optimal regression formula: In first stage we used all the independent variables the results show that they explain about 74.8% of the effect of independent variables on the ROE, the formula will be:

\[ Y_{roe} = -0.1 + 5.583 \text{ROA} + 0.131 \text{TDA} + 0.307 \text{TLA} + 0.182 \text{TLD} \]

It is found that both TLA and TLD are not significant even at .05 level. So we rejected H0 for 1st. and 2nd hypothesis and accepted 3rd and 4th hypothesis. In second stage the most insignificant variable was omitted (TLD) the rest of the independent variables explain about 74% of the effect of independent variables on the ROE, the formula will be:

\[ Y_{roe} = -0.08 + 6.128 \text{ROA} + 0.089 \text{TDA} + 0.07 \text{TLA} \]

Still TLA is not significant even at 5% level so we rejected again H0 for the 1st and 2nd hypothesis, and accepted 4th hypothesis. So we moved to the third stage, in which the insignificant variable was dropped. After that the independent variables explain about 74.5% of the effect of independent variables on the ROE, the formula will be:

\[ Y_{roe} = -0.055 + 6.044 \text{ROA} + 0.086 \text{TDA} \]

All variables are significant even at 1% level. So we reject the null hypothesis 1st and 2nd. This means that only ROA and TDA are the main variables that affect the accounting performance of Palestinian banks. They both have a positive effect, an increase in ROA and an increase in total deposits to assets (low leverage) causes an increase in the ROE which is consistent with the findings of most writers. To test our model for autocorrelation we used Durbin-Watson test:

\[ D^* = \frac{\sum (e_t - e_{t-1})^2}{\sum e_t^2} \]

Where: \( D^* \) : computed value .

Reject the existence of autocorrelation if \( D^* \) is more than DU and do not reject if it is less than DL. The test is inconclusive if \( DL < D^* < DU \) At the 5% level \( DL = 1.20 \) and \( DU = 1.41 \) (Kmenta 1997).

Since the calculated \( D^* \) is 1.73 more than DU we reject the existence of autocorrelation.

The next table represents the results for equation 2 of our model where we tried to find the effect on the market efficiency using Tobin's Q test.
Table (4): MLR between Q & Independent Variables

<table>
<thead>
<tr>
<th>Model</th>
<th>Adjusted R Square</th>
<th>Durbin-Watson</th>
<th>F</th>
<th>Sig.</th>
<th>B</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>.577</td>
<td></td>
<td>11.566</td>
<td>.000b</td>
<td>(Constant) .385-</td>
<td>.942-</td>
<td>.355</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ROA 10.326</td>
<td>1.502</td>
<td>.145</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TDA 2.196</td>
<td>5.170</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TLA 1.535</td>
<td>.875</td>
<td>.389</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TLD 1.591</td>
<td>1.384</td>
<td>.178</td>
</tr>
<tr>
<td>Stage 2</td>
<td>.580</td>
<td>1.569</td>
<td>15.295</td>
<td>.000b</td>
<td>(Constant) .145</td>
<td>.480</td>
<td>.635</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ROA 12.397</td>
<td>1.930</td>
<td>.064</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TDA 1.981</td>
<td>5.741</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TLD .734</td>
<td>1.225</td>
<td>.231</td>
</tr>
<tr>
<td>Stage 3</td>
<td>.573</td>
<td></td>
<td>21.815</td>
<td>.000b</td>
<td>(Constant) .392</td>
<td>1.740</td>
<td>.093</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ROA 15.730</td>
<td>2.680</td>
<td>.012</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TDA 1.848</td>
<td>5.594</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table (4) shows that the study used three stages to get the optimal regression formula: In first stage we used all independent variables which shows that they explain about 57.7% of the effect of independent variables on the Q, the formula will become:

\[ Y_q = -0.385 + 10.326 \text{ROA} + 2.196 \text{TDA} + 1.535 \text{TLA} + 1.591 \text{TLD} \]

The same thing was found here where neither TLA nor TLD is significant even at 5% level. So 5\(^{th}\) and 6\(^{th}\) hypothesis are rejected and 7\(^{th}\) and 8\(^{th}\) are accepted. So the least significant variable was omitted and we moved to the second stage. In second stage TLA was omitted the rest of the independent variables explain about 58% of the effect of independent variables on the Q, the formula will become: \[ Y_q = 0.145 + 12.397 \text{ROA} + 1.981 \text{TDA} + 0.734 \text{TLD} \]

The variable TLD is still not significant even at the 5% level. So we rejected H0 for the 5\(^{th}\) and the 6\(^{th}\) hypothesis and accepted 7th. So the system removed the TLD variable and moved to the third stage. In third stage after dropping TLD, the independent variables explain about 57.3% of the effect of independent variables on the Q, the formula will become: \[ Y_q = 0.392 + 15.730 \text{ROA} + 1.848 \text{TDA} \]

So we rejected the null hypothesis 5th and 6th. This means that increase in ROA and increase in TDA (decrease in bank leverage) will cause an increase in market value for Palestinian Banks. This is also consistent with the findings of most writers. Durbin-Watson test found that D* equal 1.57 which is higher than DU so there is no autocorrelation in our model.

5. **Summary and Conclusions**

Palestinian banks have a very low return to assets (.007) and return to equity (.045) ratios due to lower loans to assets (.31) and loans to deposits (.41) ratios compared to neighboring countries (.75). This low ratio of loans has affected our findings which shows weak correlation between loans and return on equity and loans and market value. This means that bank loans has no effect on bank efficiency. We found strong correlation between return on assets and efficiency; and total deposit to total assets (a measure of leverage) and...
efficiency. The same variables have the same effect on market value while loans has a weak effect. These results are consistent with many studies that proved a positive relationship between leverage and market efficiency.

6. References: