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# THE DETERMINANTS OF BANK CAPITAL RATIO ON THE MARKET EFFICIENCY OF ALBANIAN BANKS

# DETERMINANTY WSKAŹNIKA KAPITAŁU BANKOWEGO A EFEKTYWNOŚĆ ALBAŃSKICH BANKÓW

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**Streszczenie.** Niniejsza praca ma na celu określenie związku pomiędzy skutecznością rynkową a strukturą kapitałową instytucji finansowych w Albanii. W pracy zaproponowano model badania wpływu wybranych zmiennych takich jak: stopa zwrotu z aktywów (ROA), wskaźnik udziału depozytów w aktywach, wskaźnik udziału kredytów w aktywach oraz wskaźnik udziału kredytów w depozytach na rentowność kapitału własnego (efektywność banku). Ustalono, że jedynie takie mechanizmy jak dźwignia finansowa oraz kredyty/depozyty wywierają znaczący negatywny wpływ na rentowność banku, natomiast inne zmienne, po ponownym zastosowaniu funkcji regresji, okazały się być nieistotne.

**Key words:** Deposit to Assets, Deposit to Equity, Loans to Total Deposits, Return on Assets, Return on Equity.

**Słowa kluczowe:** stopa zwrotu z aktywów (ROA), stopa zwrotu z kapitału własnego (ROE), wskaźnik nadwyżki kredytów do depozytów ogółem (LTD), wskaźnik udziału depozytów w aktywach, wskaźnik udziału depozytów w kapitale własnym.

## INTRODUCTION

Capital structure decisions play a vital role in maximising the performance of, and improving the value of a firm. Capital structure includes the decision about the combination of the various sources of funds, which a firm uses to finance its operations and capital investments. These sources include the use of long-term debt finance, short-term debt finance called debt financing, preferred stock and common stock also called equity financing.

Firms in an underdeveloped market are faced with financial distress and volatility from interest rates, inflation and tax rates all of which play a significant role in the decision making process regarding the optimal capital structure decisions (Karadeniz et al. 2009). Albania is a developing country and has a very small and underdeveloped debt market relying primarily on bank debt to finance its operations and capital investment needs. No prior research work has been done in the Albanian market to find a relationship between capital structure decisions and bank performance.

The purpose of the study is to measure the effect of capital structure on the performance of Albanian Banks. So in this study, only Tobin's Q is used to measure the bank performance/efficiency. No other study has been conducted for Albanian financial institutions to find out what the variable affecting bank performance are. This paper is focused on financial

institutions because almost 95.5% of the financial system is covered by the banking sector. Among three performance measures (ROA, ROE and Tobin's Q),Tobin's Q was chosen as a proxy.

**Literature**

The effect of the capital structure of financial institutions was first noticed by Berger who found a positive relationship between the capital asset ratio and the earnings of the bank. This contradicted the conventional relationship between earnings and capital, as higher capital reduces the return on equity (Berger et al. 1995). When testing bank efficiency, Berger and DeYoung (1997) found that there is an inter-temporal relationship between the quality of loans and efficiency and bank capital. They concluded that cost inefficient banks tend to have high loan problems and poor quality loans.

Mishkin (1996) explains that an increase in monetary supply would, according to Tobin's q, lead to higher spending on the stock market, an increase in stock prices, a higher value of Q and an increase in investment spending. The effects of wealth are manifested in changes in households' wealth due to changes in stock prices. When stock prices increase, consumers become wealthier and have more money to spend. In the case of a monetary expansion, a decrease in the official interest rate would lead to higher investment and higher consumption, and consequently to higher aggregate demand[1] (Monetary transmission, Mechanism in Albania).

In examining the relationship between 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 to an increase in cost which equates to more than their benefits to non-financial firms. El-Sayed Ebaid (2009) investigated the impact of capital structure choice on firm performance in Egypt, using three of accounting based measures of financial performance (i.e. return on equity (ROE), return on assets (ROA), and gross profit margin). Based on a sample of non-financial Egyptian listed firms from 1997 to 2005 the results revealed that the choice of capital structure, in general terms, has a weak-to-no impact on firm's performance.

Abor (2005) examined the relationship between capital structure and the profitability of listed firms on the Ghana Stock Exchange (GSE) over a five-year period. The results presented a significantly positive relationship between the ratio of short-term debt and total assets and ROE. However, a negative relationship between the ratio of long-term debt and total assets and ROE was also found.

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[1] Monetary transmission mechanism in Albania, Gramoz Kolasi, Hilda Shijaku, Diana Shtylla.

Majumdar et al. (1999) examined the relationship between the levels of debt in the capital structure and performance for a sample of Indian firms, the results of which revealed that this relationship for Indian firms is significantly negative.

Gleason et al. (2000) investigated the Interrelationship between culture, capital structure, and performance for European retailers. Their study found a negative relationship between capital structure and performance which suggests that agency issues might lead to a higher than appropriate use of levels of debt in the capital structure, thereby producing lower performance.

In comparing banks to non-financial firms it has been 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. In 1990, U.S. banks 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 are aware of the fact that financial firms are providers of loans and 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. The non-deposited liabilities (commercial notes and bonds) of U.S banks accounted for 26.5% of their total liabilities in 2002 Saunders and Cornett (2003).

Since a banks' function is to offer loans in a competitive environment, financial institutions should have a higher leverage than non-financial institutions, (Inderst, 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 one 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), the greater the association with higher profit efficiency is. Another study, which agreed with these findings, was done by Siddiqui, Shoaib (2011) on Pakistani banks and is also consistent with that of Berger, di Patti (2002). However, Random and Effects models as proved the Modigliani and Miller proposition state that capital structure has no effect on the value of banks.

Abor (2007) evaluated the relationship between capital structure and the performance of small and medium size firms (SMEs) in South Africa and Ghana. He found a significantly negative relationship between financial leverage measured by a ratio of short-term debt, long-term debt (significant but positive), total debt to total assets and firm performance measured by gross profit margin in both South Africa and Ghana. Furthermore, a negative relationship existed between the measures of capital structure and the firms performance measured by return on assets in Ghanaian firms.

Zeitun and Tian (2007) in the study on Jordanian firms found a highly negative relationship on the firms' performance by employing both market and accounting based variables. Whereas, the relationships among capital structure variables and firm performance varies across industries. The relation between capital structure variables and performance vari-

ables in the engineering sector is insignificant. The market based measures for performance were Tobin's Q and price earnings ratio.

The remarkable Tobin's Q causes Chinese firms to prefer equity financing over debt financing at least from the perspective of state or institutional shareholders (Huang, Song 2006). What is more, the management prefers equity financing rather than debt financing because the former is not binding. Another possible explanation is the fact that the Chinese bond market is still in its developmental infancy. Banks are the major or even the only source of a firms' external debt. As a result, firms have to rely on equity financing and trade credit, under which firms owe each other in the form of accounts payable. In order to provide more financing opportunities for Chinese firms, it is desirable for China to accelerate the development of its bond market.

Salteh et al. (2012) provide evidence that indicates a firm's performance can be either positively or even negatively related to the capital structure. The results indicate that a firm's performance, which is measured by ROE, MBVR & Tobin's Q is significantly and positively associated with the capital structure, while there is a negative relationship between capital structure and both ROA and EPS. These findings are not consistent with Champion (1999), Gosh et al. (2000), Hadlock, James (2002), Frank, Goyal (2003), Berger, Bonaccorsi di Patti (2006), Abbadi, Abu-Rub (2012) who revealed a positive relationship between a firm's performance and the capital structure, which is consistent with Rajan, Zingales (1995), Zeitun, Tian (2007) and Abor[2] (2007) who indicate that a firm's performance is negatively related to the firm's performance measures, in both the accounting and market's measures. They found that short-term debt to total assets (STDTA) level has a significantly positive effect on the market performance measure (Tobin's Q).

Literature related to the measures of a firm's performance shows that a number of measures were used to judge the firm's performance. Some researchers have used accounting based measure to judge the performance. Accounting based variables of the performance are profitability ratios. Majumdar et al. (1999) and Abor (2005) also used asset returns, equity returns and profitability margins as variables of a firm's performance.

Welch (2004) used market based measures for performance. He measured performance by the stock returns and the volatility in returns. Further, Zeitun and Tian (2007) used Tobin's Q variable for performance, which uses a combination of accounting and market values. Whereas, Abor (2007) used both accounting based variables and Tobin's Q based variables to measure performance.

The Albanian banking system regulatory framework is designed to strengthen the sector. One of the most important projects still ongoing is the implementation of the Basel II requirements for risk assessment and management. Once the new capital adequacy regula-

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[2] Abor (2007) used both accounting based variables and Tobin's Q based variables to measure performance.

tion is approved, banks will be given the necessary time to adapt their internal system to the new requirements and build the indispensable human capacity.

During 2011, The Bank of Albania conducted an impact study, regarding Basel III liquidity indicators, with the participation of all banks. Currently, there are no plans to include our bank indicators as part of the Basel regulatory framework. The Bank of Albania is now in the process of a comprehensive revision of the guideline in force on regulatory capital. Generally, banks remain well capitalised and highly liquid. The predominantly foreign-owned sector had a capital adequacy ratio of 15.9% in September 2012, which is. well above the required minimum and slightly higher on a year-on-year basis.

The main concern regarding financial stability is the deteriorating quality of bank loans. Due in part to recent financial crisis, our financial system is under pressure from a rising number of non-performing loans (NPLs). NPLs as a share of total loans increased by 4.3 percentage points year-on-year to 22.7% at the end of September 2012[3]. A stress test carried out by the central bank has shown that adverse events, like a drop in GDP growth or a depreciation of the national currency, may require the recapitalisation of individual banks or of the banking sector as a whole. While the risk of contagion from Greek parent banks to Albanian subsidiaries has declined, the exposure to Italian banks continues to be "relevant". Overall it seems fair to assess that, even though the financial system appears resilient, the risks to financial stability have not entirely disappeared.

**The Model**

My model is based on the model that M. Abbadi and Abu-Rub created in order to find a relationship between the market efficiency and capital structure of Palestinian financial institutions (Abbadi, Abu-Rub 2012). Their sample included 8 banks (Palestinian) while my model includes all 16 banks within our banking system. The data for the research is taken from secondary sources such as the annual report of 2011 of BOA[4] covering the period of 6 years 2006–2011.

The purpose of the study is to measure the effect of capital structure on the performance of Albanian Banks. So in this study, only Tobin's Q has been used to measure the bank performance / efficiency. The independent variables used in both measures are the return on asset, bank loan over deposit, bank deposits over total assets, and loan over asset. Since there is multicollinearity between some of the independent variables these were removed.

To determine the impact of the independent variables on the dependent variables the study used Multiple Linear Regression. So our model become as follows:

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[3] http://ec.europa.eu/economy_finance/publications/occasional_paper/2013/pdf/ocp158_en.pdf
[4] Bank of Albania.

$$y = \beta + \beta_1 ROA + \beta_2 LD + \beta_3 DA + \beta_4 LA + \varepsilon_1$$

where:

$y$ = (Q) efficiency,

$ROA$ = return on asset,

$LD$ = ratio of total loans to total deposit,

$DA$ = ratio of total deposit to asset,

$LA$ = ration of total loan to asset.

So, the first model is based on the profit maximisation concept where $\varepsilon_i$ is a stochastic disturbance. To complete the specification of the regression model we add the following assumptions:

1. $\varepsilon_i$ is normally distributed,
2. $E(\varepsilon_i) = 0$,
3. $E(\varepsilon_i^2) = \sigma^2$,
4. $E(\varepsilon_{ij})$ for $I \neq j$,
5. No exact linear relation exists between any of the explanatory variables.

## Hypotheses Testing:

H0: No relationship between *ROA* and (Q) performance/efficiency,

H1: There is a relationship between them,

H2: No relationship between *LD* and (Q) performance/efficiency,

H3: There is a relationship between them,

H4: No relationship between *DA* and (Q) performance/efficiency,

H5: There is a relationship between them,

H6: No relationship between *LA* and (Q) performance/efficiency,

H7: There is a relationship between them.

## EMPIRICAL RESULTS

### Descriptive Statistics

The following table provides statistical results about the variables used in the models for all 16 banks for the time period 2006–2011. Table 1 shows that the average values of Tobin's Q (1.18%) is very low, which revealed that the market value of listed banks is lower than their book values, this only happens when the market is very week 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 (bank leverage) is about 80%. This ratio is acceptable because this is the nature of Albanian deposits. The ratio of total loans to total assets is 44.69% and total loans to total deposits is 55.78% with ROA at 0.84%.

Table 1.  Descriptive statistic

|  | *LA* | *ROA* | *LD* | *DA* | *Q* |
|---|---|---|---|---|---|
| Count | 6.0000 | 6.0000 | 6.0000 | 6.0000 | 6.0000 |
| Mean | 0.4469 | 0.0084 | 0.5578 | 0.8029 | 0.0118 |
| Sample variance | 0.0065 | 0.0000 | 0.0113 | 0.0008 | 0.0000 |
| Sample standard deviation | 0.0808 | 0.0056 | 0.1061 | 0.0278 | 0.0043 |
| Minimum | 0.3063 | 0.0007 | 0.3766 | 0.7554 | 0.0085 |
| Maximum | 0.5076 | 0.0157 | 0.6480 | 0.8249 | 0.0193 |
| Range | 0.2013 | 0.0150 | 0.2714 | 0.0694 | 0.0108 |
| Skewness | −1.3613 | −0.0173 | −1.2717 | −1.2613 | 1.3787 |
| Kurtosis | 0.8024 | −1.1396 | 0.4489 | 0.4441 | 1.0356 |
| Coefficient of variation (CV) | 0.1807 | 0.6704 | 0.1902 | 0.0346 | 0.3608 |

Source: own study.

Table 2 is built according to Person correlation matrix which shows the correlation between explanatory variables. The results show that there is a very strong positive correlation (98%) between loan / deposit and loan / asset, and a strong negative correlation between ROA and loan to deposit (76%), and the loan / asset has a negative relationship (−0.81) to ROA.

Table 2.  Correlation Matrix: Here we include all the variable of our study

|  | *LD* | *LA* | *ROA* | *DA* | *Q* |
|---|---|---|---|---|---|
| *LD* | 1.000 | | | | |
| *LA* | 0.980 | 1.000 | | | |
| *ROA* | −0.760 | −0.810 | 1.000 | | |
| *DA* | −0.401 | −0.212 | 0.004 | 1.000 | |
| *Q* | −0.962 | −0.996 | 0.807 | 0.141 | 1.000 |

Source: own study.
±0.811    critical value 0.05 (two-tail).
±0.917    critical value 0.01 (two-tail).

Due to multicollinearity problem we remove the loan / asset in order to run the regression model.

**Model estimation results**

Table 3 shows the result of the estimation of the first equation using OLSQ to estimate the independent variables on the ROE in three different stages:
*stage 1:* we did the regression after we omit LA due to multicollinearity problem,
*stage 2:* we omitted ROA after we found it not significant.
The first stage shows that the correlation between variables is at level 0.992 and the explanatory variable explains 99.8% of the variable of efficiency. The variable loan/deposit (p-value = 0.0048) and deposit/asset (p-value = 0.0264) are significant variables at 0.05

level of significance, while ROA (p-value = 0.6650) is not significant at 0.05 level of signifi-cance.

$$y = 0.0744 - 0.0446 LD - 0.0270 ROA - 0.0467 DA$$

Table 3. Regression model

|  | Adjusted r ≤ | r | F | p-value |  | B | p-value |
|---|---|---|---|---|---|---|---|
| STAGE 1: | 0.992 | 99.8% | 208.8 | 0.0048 | Intercept | 0.0744 | 0.0105 |
|  |  |  |  |  | LOAN/DEPOSIT | −0.0446 | 0.0048 |
|  |  |  |  |  | ROA | −0.0270 | 0.6650 |
|  |  |  |  |  | DEPOSIT/ASSET | −0.0467 | 0.0264 |
| STAGE 2: | 0.994 | 99.8% | 416.9 | 0.0002 | Intercept | 0.0718 | 0.0007 |
|  |  |  |  |  | LOAN/DEPOSIT | −0.0433 | 0.0001 |
|  |  |  |  |  | DEPOSIT/ASSET | −0.0447 | 0.0045 |

Source: own study

The final regression equation is after we drop the insignificance variable ROA, at which point we re-run the regression equation:

$$y = 0.018 - 0.0433 LD - 0.0447 DA$$

The first stage shows that the correlation between efficiency (Q) and LD and DA (banks leverage) is at the level of 0.994 and the explanatory variable explains 99.8% of the per-formance variable, while the remaining percent is explained from the other explanatory vari-able. The loan to deposit (p-value = 0.0001) and deposit to asset (p-value = 0.0045) remain significant variables at 0.05 level of significance where even the intercept is significant (p-value = 0.0007).

This means that an increase in one unit of bank leverage (increase deposit / asset) will cause a decrease of 0.0447 unit of market value for Albanian banks. An increase of one unit of loan to deposit will also cause a decrease of 0.0433 unit of market value for Albanian banks This is almost consistent with the findings of most writers.

All variables are significant even at 1% level. So we accept only the third and fifth hy-potheses. This means that there is a negative correlation between deposit/asset and loan/deposit with market performance measure (Tobin's Q).

To test our model for autocorrelation we used Durbin–Watson test:

$$D = \frac{\sum_{t=2}^{n} (et - et - 1)^2}{\sum_{t=1}^{n} e^2 t}$$

The existence of autocorrelation is where D calculated is between the interval D-Low and D-Upper (DL < D < DU), at the 5% level of significance where DL = 1.20 and DU = 1.41 (Kmenta 1997). Since the calculated D from the SPSS results is 2.52 more than DU we reject the existence of autocorrelation.

## CONCLUSIONS

Albanian banks have gone under the lower level of return asset (0.0084) from 2006–2011, so bank performance in the generation of net income from bank asset use decreased. So our findings affected our study showing us that there is no correlation of ROA and LA (0.4469) to bank performance; while Loan to Deposit (0.5578) and Deposit to Asset (0.8029) are higher than the above variable showing us their strong correlation with market bank performance. So, we conclude that loans and deposits are the main variable affecting Albanian bank performance.

The results in fact depicted the period where the financial crisis was present. So we have to take the fact that the results maybe be affected by lower financial indicators during these years into consideration. An interesting point is the fact that these indicators (for our study deposit growth and loan growth) were reduced mostly during the European financial crisis (Greek crisis) and they increased during the global crisis (American financial crisis)[5].

The fact that there is a negative correlation between Albanian bank leverage and market performance measured by Tobin's Q being consistent to many studies mentioned above proves interesting. We have to take into consideration the fact that the results consisted of a short-term period and the period taken into consideration may have been affected by the financial crises so it would be prudent to consider the next study over longer period to have an overall picture of Albanian bank performance.

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[5] http://ec.europa.eu/economy_finance/publications/occasional_paper/2013/pdf/ocp158_en.pdf

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