CHANGING THE GAME; NEW FRAME WORK OF CAPITAL ADEQUACY RATIO

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ABESTRACT.

The supervisory committees governed the banking supervision on all over the world which becomes a core activity Since the financial crisis of 2008. For the smooth flow of credit in an economy, it is essential that banks should be financially sound so as to meet the various requirements of other fields. Capital adequacy ratio (CAR) is one of the measures which ensure the financial soundness of banks in absorbing a reasonable amount of loss. The objective of this paper is to develop a framework for measuring the capital adequacy by assessing the bank's risks according to the basics of Basel's norms in respect of the component of tire1&2 of capital adequacy. The model used the relationships between equity, deposits, loans and assets to determine the risk ratio, which is calculated in regard of retention ratio. As liquidity risk is usually regulated from a micro prudential perspective, a better knowledge of these interactions among banks may have very important consequences on the design of macro prudential policy. The paper finds that the framework for the capital adequacy that is developed and reached a satisfactory results and could be used by the banks.

***Keywords*:** Capital adequacy ratio (CAR), Liquidity, Credit Risk, Loan to Deposits (LTD), Equity to Assets (ETA), Retained Earnings (RE).

Section 1

1- Capital Adequacy: an overview

1.1 Introduction

The inability of a bank or a financial institution to effectively control its credit risk has a substantial adverse result on the performance of its profitability both in the short and long term. The principal direction to improve the capital adequacy ratio is the growth in its flexibility when determining the value of risks inherent to various bank organizations.

Basel Accord I is termed the 1988 Basel Accord. It is primarily concerned with provision of capital to absorb losses arising from credit risk. The Accord was always intended to evolve over time, to give greater precision to the definition of general provisions or general loan -loss reserves. In June 1999, the Committee issued a proposal for a new capital adequacy framework to replace the 1988 Accord, after making an extensive consulting with banking sector representatives, and other parties such as; supervisory agencies, central banks and outside observers in an attempt to develop significantly more risk-sensitive capital requirements.

This means under that Basel Accord I capital is provided in relation to the degree of credit risk in the banking business. The various assets of a bank are classified and grouped into the following risk weight categories based on perceived credit risk by a regulator, in this case the RBI:

1) 0% risk weight (e.g. home country sovereign debt).
2) 10%, 20%, 50% risk weight.
3) 100% risk weight (e.g. investment in corporate bonds, loans, etc.).

On the other hand, Basel accord II was introduced with a view to overcome limitations of Basel Accord I. The following are the limitations of Basel Accord I:

- It considers only credit risk. In view of this, capital is provided in proportion to credit risk in the banking business. Due to changes in the securities' markets and regulator's policy on banking business, most banks have investment banking business. Because of this, it is essential to provide capital for market risk also.

- Basel Accord 1 create a wider gap between regulatory capital and economic capital. This means that under Basel Accord 1 banks are permitted to undertake more risky business with smaller amount of capital.
- It ignores the quality of loan assets irrespective of credit rating of borrowers. It presumes the same credit quality and accordingly the same risk weight i.e. 100% is considered in respect of loan assets irrespective of credit rating.

In response to the risk factors arising with the global financial crisis in 2008, and the collapsed of Lehman Brothers in September 2008, the Basel Committee issued Principles for sound liquidity risk management and supervision. In July 2009, the Committee issued a further package of documents to strengthen the Basel II capital framework, notably with regard to the treatment of certain complex securitization positions, off-balance sheet vehicles and trading book exposures.

In December 2010 versions were set out in Basel III: International framework for liquidity risk measurement, standards and monitoring and Basel III: A global regulatory framework for more resilient banks and banking systems. The enhanced Basel framework revised and strengthen the three pillars established by Basel II.

The hereunder paper provides a new methodology that could be used to calculate the capital adequacy in regard to credit risk and to help in the accommodation of divergence in the reactions of banks rules in their capital decisions. Using this methodology, we ask how banks' boards are likely to play out during times of heightened financial distress and prosperity.

Keeping in view the limitations of Basel Accord II, The Basel III Accord has proposed to improve the quality of capital in the form of higher equity capital. With a provision of capital conversion buffer in the form of equity capital, banks will be able to recover losses during a financial crisis. The implementation of the standards on liquidity ratios will help banks to overcome liquidity crisis. Once these standards under Basel III are fully implemented along with standard on capital risk asset ratio (CRAR) it will help banks to become financially strong and viable commercial enterprises in the long run.

The Basel Accord III norm is already introduced and banks are expected to achieve CRAR of 11.5% by March 31, 2019 in a phased manner. This can be seen from the data given in Table 1. CRAR under Basel III Accord is increased from 9% to 11.5% of all risk-weighted assets. Banks have to maintain 5.5% of RWAs in the form of equity (i.e. net owned funds). Additional Tier I capital must be of 1.5% of RWAs. With effect from March 31, 2019, banks will have to maintain capital conversion buffer not less than 2.5% of risk-weighted assets.

1.2 Research Methodology

Banks are exposed to different types of risks, which affect the performance and activity of these banks, since the primary goal of the banking management is to maximize the shareholders' wealth, so in achieving this goal banks' managers should assess the cash flows and the assumed risks as a result of directing its financial resources in different areas of utilization.

This paper is conducted by both quantitative and qualitative research methods. The primary qualitative research is done trough main financial institutions sites such as the EBA (European Banking Authority), ECB (European Central Bank) and IMF (International Monetary Fund) and researches. The quantitative research is conducted trough analysis of testing the assumptions related to a number of ratios .

The paper aims to examine and find the relationships between a number of financial ratios for determining capital adequacy ratio. The use of ratio in measuring the performance is common in the literatures of finance and accounting practices.

1.3 Research design.

The research is organized as follows: Section one presents an extensive review of literature on the impact of credit risk on capital requirements. Section two spells out the methodological approaches used in this research. While section three presents the research module, and to show the contribution of the research results.

1.4 Literature review

Credit risk is the risk that a borrower defaults and does not honor its obligation to service debt. It can occur when the counterpart is unable to pay or cannot pay on time (Gestel and Baesens, 2008, p. 24). Solvency and liquidity risk management is a process that enables shareholders of the bank to maximize their profit without exceeding an acceptable risk. One of the most important objectives in banking

operations is to choose the most appropriate ratio between the risk level and the profit rate (Jasienė, 2012).

(Garbanov, 2010) describes efficient risk management as one of the methods enhancing a bank‘s competitiveness, decreasing its financial costs and increasing the worth of the bank. In the banking business, risk management does not mean the full elimination of risk from the operations of the bank; complete elimination of risk not being feasible does not mean that banks can do nothing and reconcile to the damage caused by risk as if it were inevitable. Therefore, the objective that any bank defines is a proper risk management. This puts banks on a level playing field to compete among themselves while properly managing the risk.

Risk is defined as a probability of unspecified future events, a foregone or a missed opportunity, or a positive or a negative deviation from the projected outcome, the probability of damage or profit (Jasevičienė, Jurkšaitytė, 2014). It is for this reason that the solvency and the liquidity risk in banking is an object to be managed in order to ensure a successful performance of the banking system. A successful solution of risk management problems becomes a guarantor of the success of the activity being surveyed. Risk management issues in Lithuania, as well as worldwide, are receiving exceptional attention and importance both in terms of expanding the variety of the risks being surveyed and of developing a set of risk management instruments (Aleksandra& others , 2014).

(Mohamed, 2015), show that, if the bank liquidity improves than bank efficiency is also increase where it doesn't rely on bank liquidity individually. Also, Banks are more efficient solvent and profitable because banks rely on management individually. (Fatima, 2014) explain that Capital adequacy ratio is one of the measures which ensure the financial soundness of banks in absorbing a reasonable amount of loss. Also, capital adequacy requirements have existed for a long time, but the two most important are those specified by the Basel committee of BIS.

(Aleksandra& others , 2014), founded that the most important in banks’ capital adequacy and liquidity risk management is quality control and the harmonization of bank assets and liabilities. Besides, it is offered to review the calculation of requirements and procedures, to impose additional limits to ensure the basic standards and an efficient banking security.

Section 2

2- Methodological Approaches

2.1 Defining the variables

Capital adequacy ratio (CAR) is the ratio that determines the bank's capacity to meet the time liabilities and other risks such as credit risk, operational risk etc (Wikipedia.com). In the most simple formulation, a bank's capital is the "cushion" for potential losses, and protects the bank's depositors and other lenders. Banking regulators in most countries define and monitor CAR to protect depositors, thereby maintaining confidence in the banking system.

The aim of this paper is to build a new methodology to calculate capital adequacy in consistent with banking supervision rules, based on analysis of the component of tier 1 and tier 2. Also, the paper aims to develop new recommendations on improving such calculations applied on banks. The methodology of the study is based on translating the relationships between the assets and liabilities of the banks into building base. That means employing official relationships depending on assumed ratios of Equity, Loans, Deposits and Assets of the banks and find the relation between such ratios to calculate risk weighted average to reach capital adequacy ratio. We went to find the relationship between two ratios; first: is equity to assets (EAR), second is loans to deposits (LDR) subject to the ratio of dividends or retention ratio. The ratios are explained as fallow;

2.1.1 Equity to Assets Ratio (EAR)

> *The stability of a bank depends on a bank's capital, its quality and size. A bank's capital is a mandatory and integral part of its financial resources, and its development in the form of core capital is a required step even before establishing a commercial bank (Saksonova 2006). Practically every stage of a bank's business is directly or indirectly linked to the capital at the bank's disposal and its value.*

If we say that the equity to assets ratio is a measure of the Bank's ability to finance part of its various investments, whether in loans of various types or financial

investments, we can make it clear that this indicator is a measure of the size and value of liquidity available at the bank and thus it is a measure of the degree of financial liquidity it has Arising from operating in the balance sheet.

There are two studies that examine to what extent does the M-M principle of conservation of risk hold for banks. Specifically, the theory would suggest, that if the bank's ratio of equity to assets is doubled, and if underlying riskiness of the assets does not change, its beta coefficient should fall by one half.

Miles, Yang and Marcheggiano (2011) approach this question by examining six large publicly traded banks in UK over the period between 1992-2010 using CAPM to decompose asset betas into equity betas and assuming the debt is riskless. They regress half-yearly betas to get an estimate of how leverage ratio impacts the correlation between market returns and bank equity returns. Results yield highly significant positive relationship between leverage and equity betas.

A study by Kashyap, Stein and Hanson (2010) undertakes a similar investigation of large US publicly traded banking firms with assets exceeding $10billon. They estimate market betas and return volatilities using monthly regressions. Both of the regressions yield statistically significant results satisfying the prediction that betas and volatilities decrease as the ratio of equity to assets increases.

A bank's capital serves as one of determinants in the evaluation process of its stability. The adequacy of the bank's own funds provides for its financial stability. The size of capital greatly determines the bank's competitiveness. Since shareholders of a bank always seek to increase the profitability of their investments, the bank's endeavors to increase the profit reflect on prices of products and services it provides. The capital also serves as an indicator of the bank's credit solvency, since the total amount of its assets may not exceed a certain capital adequacy limit, which means that the maximum amount of the bank's assets depends on the size of its capital.

The fundamental fact on the research is that; the amount of capital as less than the amount of assets. This means that, the equity will never be equal or more than the total assets of the bank. That because the banks finance most of its assets from deposits and other sources of finance such as loans, interbank etc. As a reason that

because banks are highly geared, relatively small changes in the value of their risk assets would have a much more significant proportional effect on their net asset value, due to the multiplier effect of the gearing. Small changes in these values can therefore have quite significant impacts on net asset values, the researcher tends to use the net assets as a measure to (EAR).

According to the analysis, interpretations and previous concepts and the interpretation of the importance of the equity index to assets, this indicator can be expressed according to the following:

Equity (E) / Net Assets (NA) or E/ NA ……(1)

2.1.2 Loans to Deposits Ratio (LDR)

> *Loan to deposit ratio (LDR) defined as; measures outstanding loans versus the total deposits on hand on a day-to-day basis as a indicator of bank liquidity (the low dictionary). Also it means; The amount of a bank's loans divided by the amount of its deposits at any given time. The higher the ratio, the more the bank is relying on borrowed funds, which are generally more costly than most types of deposits (investowords.com).*

On the other hand, a bank must attract a certain amount of customer deposits to be able to ensure full scale lending operations, which is only possible, if the bank has gained public trust and that is possible with sufficient capital reserve.

Deposits to loans are one of the other criteria that reflect the volume of investments made from deposits to loans of all kinds - short, medium and long term, which reflects the bank's ability to pay its obligations to depositors. This is a double-edged sword. Which is the return on deposits but also means the high degree of risk associated with credit operations usually in the event of an increase in the value of non-performing loans.

The loan-to-deposit ratio is the ratio of a bank's total outstanding loans for a period to its total deposit balance over the same period. So an LDR figure of 100% indicates that a bank lends a dollar to customers for every dollar that it brings in as deposits. But this also means that the bank doesn't have significant cash on hand for

contingencies. A combination of prudence and regulatory requirements suggests that for a traditional bank, the LDR should be around 80-90%. With a business model that relies heavily on traditional loans-and-deposits services. (Trefis team).

The fundamental role of banks typically involves the transformation of liquid deposit liabilities into illiquid assets such as loans; this makes banks inherently vulnerable to liquidity risk. Liquidity-risk management seeks to ensure a bank's ability to continue to perform this fundamental role. While some out-flows are known with certainty, risk arises from the need to meet uncertain cash flow obligations, which depend on external events and on the behaviour of other agents.

Accordingly, the second equation can be codified in accordance with the following:

Deposits (D) / Loans (L) or D/L ……(2)

2.1.3 Retained Earnings Ratio (RER)

> *Retention Ratio indicates the percentage of a bank's earnings that are not paid out in dividends but credited to retained earnings. It is the opposite of the dividend payout ratio, so that also called the retention rate (investopidia.com).*

An important element to consider when measuring capital adequacy is the ability of the Bank to maintain an appropriate amount of retained earnings so that part of it can be used to build up sufficient reserves to cope with the various risks (credit-market-operating) faced by the Bank in carrying out its activities. Then we find that the third equation is as follows:

Retention Ratio (RR) = 1 – Dividend Payout Ratio = Dividends (DI) / Net Income (NI) …… (3)

2.2 The Liquidity Coverage Ratio (LCR)

The LCR was implemented and measured in 2011, but the full 100% minimum was not enforced until 2015. The liquidity coverage ratio is an important part of the Basel Accord, defining how the value of liquid assets that are required to be held by financial institutions. The idea is that by requiring banks to hold a certain level of

highly liquid assets, they are less able to lend high levels of short-term debt (BIS, Jan. 2013).

Basel III introduced; The Liquidity Coverage Ratio (LCR) as an objective of the liquidity risk profile of banks. That to ensure that banks have an adequate stock of unencumbered high-quality liquid assets (HQLA) that can be converted easily and immediately in private markets into cash to meet their liquidity needs for a 30 calendar day liquidity stress scenario. Stressed that the LCR standard establishes a minimum level of liquidity for internationally active banks. Banks are expected to meet this standard as well as adhere to the Sound Principles. Consistent with the Committee's capital adequacy standards, national authorities may require higher minimum levels of liquidity. the LCR will be was introduced with the minimum requirement will be set at 60% (on Jan. 2015), and rise in equal annual steps to reach 100% on 1 January 2019.

	1 January 2015	1 January 2016	1 January 2017	1 January 2018	1 January 2019
Minimum LCR	60%	70%	80%	90%	100%

This means that, banks are required to have a 100% LCR, which means holding an amount of highly liquid assets that are equal to or greater than its net cash flow over a 30-day stress period. Highly liquid assets can include cash, Treasury bonds or corporate debt.

Liquidity& illiquidity scenarios

> What should bank do in different liquidity situation "; Prosperity and Depression"?

Basic liquidity risk is the chance of not having the funds available to pay liabilities due. But being forced to post collateral could be another type of liquidity risk, even if that collateral is technically an asset. More broadly speaking, realizing losses because of forced sale of immature assets, and even loss of investment opportunities due to cash constraints, could be included under the rubric of liquidity risk. With a severe market disruption, liquidity problems can be exacerbated when normally liquid assets become illiquid (Venter, 2010). These possibilities can all be reflected in model scenarios as fallow;

Bank's Liquidity in Prosperity

Most credit risk models assume that the debtor's inability to repay debts when the market value of his assets, which reflects the debtor's state of prosperity or depression, is less than the value of the accrued liabilities, known as the default boundary (eg, Black and Cox (1976), Leland (1994), Long staff and Schwartz (1995). It should be noted that, failure occurs when the market value of the assets falls below the nominal value of the debt so that the company becomes economically insolvent. Some other models based on "value-based" models predict that the debtor may be in a perfect condition to continue in its activity, despite the net negative value of the economy, as long as the value of equity (equity) is high enough to keep the company alive. In most of these models, if the company's cash flow is insufficient to service the debt while the value of the assets remains high enough, the shareholders can contribute additional funds at no cost.

Bank's Liquidity in Depression

Confidence in a bank's solvency is what sustains this business model. Depositors and other lenders roll over their loans to the bank, or other lenders replace them, when they are confident that the bank will continue to be solvent and viable. On the other hand, fear about the future solvency of the bank may provoke expectations of delayed repayment or non-repayment and may result in withdrawal of loans by existing lenders as well as deterring others from replacing them. Gearing, wholesale market-based funding models, off-balance sheet exposures and other complexities in banks' operating models may further exacerbate these fears.

Bernanke (1983) argues that bank failures increased financial intermediation costs and restricted output growth in the Depression. Keeley (1990) explain that FDIC deposit insurance is analogous to a mispriced put option on banks' assets. Under a fixed rate deposit insurance regime, banks' equity holders prefer higher risk as this means a higher value of this put option at no additional explicit costs. Taking on excessive risk, however, increases the probability of default, resulting in a loss of franchise values. Therefore, a bank would only increase its risk taking if its franchise value is low enough. Keeley, finds evidence in support of his theory, that banks with more market power tend to hold more capital and have lower default risk.

The list of fundamental shocks that may have weakened banks is a long and varied one. It includes declines in the value of bank loan portfolios produced by rising default risk in the wake of regional, sectoral, or national macro economic shocks to bank borrowers, as well as monetary-policy-induced declines in the prices of the bonds held by banks. There is no doubt that adverse fundamental shocks relevant to bank solvency were contributors to bank distress; the controversy is over the size of these fundamental shocks-that is, whether banks experiencing distress were truly insolvent or simply illiquid.

Milton Friedman and Anna J. Schwartz (1963) are the most prominent advocates of the view that many bank failures resulted from un- warranted "panic" and that failing banks were in large measure illiquid rather than insolvent. Friedman and Schwartz attach great importance to the banking crisis of late 1930, which they attribute to a "contagion of fear" that resulted from the failure of a large New York bank, the Bank of United States, which they regard as itself a victim of panic.

Section 3

3- The Module

3-1 Basic capital requirements – Tier 1, 2 and 3

The capital adequacy ratio is calculated by adding tier 1 capital to tier 2 capital and dividing by risk-weighted assets. Tier 1 capital is the core capital of a bank, which includes equity capital and disclosed reserves. This type of capital absorbs losses without requiring the bank to cease its operations; tier 2 capital is used to absorb losses in the event of liquidation.

Under the Basel Accord, a bank's capital consists of tier 1 capital and tier 2 capital, and the two types of capital are different. Tier 1 capital is a bank's core capital, whereas tier 2 capital is a bank's supplementary capital. A bank's total capital is calculated by adding its tier 1 and tier 2 capital together. Regulators use the capital ratio to determine and rank a bank's capital adequacy.

Banks fund their investments with capital and debt, such as customer deposits. Capital can absorb losses in a way that reduces the likelihood of a bank failing and the impact if it does. Regulatory capital consists of:

1. Common Equity Tier 1 – common shares, retained earnings and other reserves. This type of capital absorbs losses without requiring the bank to cease its operations. Tier 1= (paid up capital + statutory reserves + disclosed free reserves) – (equity investments in subsidiary + intangible assets + current & brought-forward losses). Additional Tier 1 – capital instruments with no fixed maturity.
2. Tier 2 – subordinated debt and general loan-loss reserves. Tier 2 is used to absorb losses in the event of liquidation. Tier 2 = Undisclosed Reserves + General Loss reserves + hybrid debt capital instruments and subordinated debts.

As of 2017, under Basel III, a bank's tier 1 and tier 2 capital must be at least 8% of its risk-weighted assets. The minimum capital adequacy ratio (including the capital

conservation buffer) is 10.5%. The capital conservation buffer recommendation is designed to build up banks' capital, which they could use in periods of stress.

3-2 Calculation of minimum capital requirements

The primary function of banks, regardless of the successive developments in the performance and functions of banks, remains to utilize the available resources of liquidity in lending operations imposed on them by the economic development processes of any country. It can be said that this function is offset by many risks related to uncertainty, and therefore banks are making provision for the lending process despite extensive studies on approving credit to a customer

Since different types of assets have different risk profiles, CAR primarily adjusts for assets that are less risky by allowing banks to "discount" lower-risk assets. The specifics of CAR calculation vary from country to country, but general approaches tend to be similar for countries that apply the Basel Accords. In the most basic application, government debt is allowed a 0% "risk weighting" - that is, they are subtracted from total assets for purposes of calculating the CAR.

It is known that, the bank's capital serves as an indicator of the bank's credit solvency, since the total amount of its assets may not exceed a certain capital adequacy limit, which means that the maximum amount of the bank's assets depends on the size of its capital. The size of capital greatly determines the bank's competitiveness. Moreover, it is crucial not only for the safety of its customers, but also for the bank's own stability, avoiding the impact of short-term financial problems (Saksonova 2006).

On the other hand, a bank must attract a certain amount of customer deposits to be able to en- sure full-scale lending operations, which is only possible, if the bank has gained public trust and that is possible with sufficient capital reserve. In case of sudden capital adequacy problems a bank may lose its competitiveness (Greuning, Brajovic Bratanovic 2009). The main function of a commercial bank's capital is generation of bank's income and profit respectively, and provide for a possibility to cover unexpected operating losses of a commercial bank (Chorafas, 2004).

3-3 The Module

3-3-1 The model measure the relationships between three main ratios, first is Equity/ Net assets, the second ratio is Deposits/ Loans both as active variables. Finally, Retained Earnings Ratio as a control variable and indicator to liquidity inside the bank from its operations.

Control Variables	Active Variables
1. Retained Earnings Ratio (RE)	1. Equity/ Net Assets (E/NA)
	2. Deposits/ Loans (D/L)

3-3-2 Equity to Net Assets as a measure of the size and value of liquidity available at the bank which comes to be as indicator of bank's stability. Increasing equity and assets, and the ratio yearly, considered as indicator that the bank have the power to support its capital against risks.

3-3-3 In this model the deposit to loan ratio can be seen as the employment ratio. Means, how much loans have been financed from deposits and how it can impacts the net interest margins.

3-3-4 As it mentioned above we assume that the model equations are ;

E/NA (X) D/L (÷) (1-Di/ Ni) = 1

Where; retention ratio (RR) = 1- dividends (Di)

And, Di= 1 - RR

3-3-5 The model assumed different weights to the first two ratios As fallow:

Equity/ Net assets: scale of percentage starting from 0.001 to 0.100 are applied for the operating the module and find the results. The figures are set in horizontal line. Deposits/ Loans: scale of percentage starting from 1.05 to 2 to describe the deposit employment percentage. The figures are set in vertical line. Finally, Retained Earnings Ratio assumed as a percentage starting from 95% to 40% as the willing of each bank at the end of the financial year. The researcher Applied the analysis to set the relation between the ratio in each line with the others in the column in accordance with retained earnings ratio.

3-4 The application of the model

The researcher tends to investigate the module results. We used the data of 16 bank from the classification of the top- ranking 100 bank in the world. The banks' financial statements and the disclosure CAR for each bank for a four year period "2014-2017". The Data were obtained from the wall street website, for each bank. Also we Applied the regression analyses to find the relation between the active variables and control variables.

The results of the research are shown as fallow;

3-4-1 The model results

As it explained before, we can use the two ratio of E/NA & L/D for the banking sample to determine the capital adequacy ratio that each bank should keep to maintain its credit risk. The finding of the model show that the max. CAR is 10% which means that the bank face high credit exposure risk. where the other situation is that the CAR is 8%, means that the bank is in a good financial strength regarding to capital requirements.

We made our references to the first and Last Schedules as fallow;

Schedule (1)

Equity/ Assets

Deposits / Loans 95%	0.001	0.005	0.01	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.06	0.065	0.07	0.075	0.08	0.085	0.090	0.095	0.1
1.05	0.9989	0.9945	0.9889	0.9834	0.9779	0.9724	0.9668	0.9613	0.9558	0.9503	0.9447	0.9392	0.9337	0.9282	0.9226	0.9171	0.9116	0.9061	0.9005	0.895	0.8895
1.1	0.9988	0.9942	0.9884	0.9826	0.9768	0.9711	0.9653	0.9595	0.9537	0.9479	0.9421	0.9363	0.9305	0.9247	0.9189	0.9132	0.9074	0.9016	0.8958	0.89	0.8842
1.2	0.9987	0.9937	0.9874	0.9811	0.9747	0.9684	0.9621	0.9558	0.9495	0.9432	0.9368	0.9305	0.9242	0.9179	0.9116	0.9053	0.8989	0.8926	0.8863	0.88	0.8737
1.3	0.9986	0.9932	0.9863	0.9795	0.9726	0.9658	0.9589	0.9521	0.9453	0.9384	0.9316	0.9247	0.9179	0.9111	0.9042	0.8974	0.8905	0.8837	0.8768	0.87	0.8632
1.4	0.9985	0.9926	0.9853	0.9779	0.9705	0.9632	0.9558	0.9484	0.9411	0.9337	0.9263	0.9189	0.9116	0.9042	0.8968	0.8895	0.8821	0.8747	0.8674	0.86	0.8526
1.5	0.9984	0.9921	0.9842	0.9763	0.9684	0.9605	0.9526	0.9447	0.9368	0.9289	0.9211	0.9132	0.9053	0.8974	0.8895	0.8816	0.8737	0.8658	0.8579	0.85	0.8421
1.6	0.9983	0.9916	0.9832	0.9747	0.9663	0.9579	0.9495	0.9411	0.9326	0.9242	0.9158	0.9074	0.8989	0.8905	0.8821	0.8737	0.8653	0.8568	0.8484	0.84	0.8316
1.7	0.9982	0.9911	0.9821	0.9732	0.9642	0.9553	0.9463	0.9374	0.9284	0.9195	0.9105	0.9016	0.8926	0.8837	0.8747	0.8658	0.8568	0.8479	0.8389	0.83	0.8211
1.8	0.9981	0.9905	0.9811	0.9716	0.9621	0.9526	0.9432	0.9337	0.9242	0.9147	0.9053	0.8958	0.8863	0.8768	0.8674	0.8579	0.8484	0.8389	0.8295	0.82	0.8105
1.9	0.998	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91	0.9	0.89	0.88	0.87	0.86	0.85	0.84	0.83	0.82	0.81	0.8
2	0.9979	0.9895	0.9789	0.9684	0.9579	0.9474	0.9368	0.9263	0.9158	0.9053	0.8947	0.8842	0.8737	0.8632	0.8526	0.8421	0.8316	0.8211	0.8105	0.8	

Schedule (12)

40%	0.001	0.005	0.01	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.05	0.055	0.06	0.065	0.07	0.075	0.08	0.085	0.090	0.095	0.1
1.05	0.9974	0.9869	0.9738	0.9606	0.9475	0.9344	0.9213	0.9081	0.895	0.8819	0.8688	0.8556	0.8425	0.8294	0.8163	0.8031	0.79	0.7769	0.7638	0.7506	0.7375
1.1	0.9974	0.9869	0.9738	0.9606	0.9475	0.9344	0.9213	0.9081	0.895	0.8819	0.8688	0.8556	0.8425	0.8294	0.8163	0.8031	0.79	0.7769	0.7638	0.7506	0.7375
1.2	0.9974	0.9869	0.9738	0.9606	0.9475	0.9344	0.9213	0.9081	0.895	0.8819	0.8688	0.8556	0.8425	0.8294	0.8163	0.8031	0.79	0.7769	0.7638	0.7506	0.7375
1.3	0.9974	0.9869	0.9738	0.9606	0.9475	0.9344	0.9213	0.9081	0.895	0.8819	0.8688	0.8556	0.8425	0.8294	0.8163	0.8031	0.79	0.7769	0.7638	0.7506	0.7375
1.4	0.9974	0.9869	0.9738	0.9606	0.9475	0.9344	0.9213	0.9081	0.895	0.8819	0.8688	0.8556	0.8425	0.8294	0.8163	0.8031	0.79	0.7769	0.7638	0.7506	0.7375
1.5	0.9974	0.9869	0.9738	0.9606	0.9475	0.9344	0.9213	0.9081	0.895	0.8819	0.8688	0.8556	0.8425	0.8294	0.8163	0.8031	0.79	0.7769	0.7638	0.7506	0.7375
1.6	0.9974	0.9869	0.9738	0.9606	0.9475	0.9344	0.9213	0.9081	0.895	0.8819	0.8688	0.8556	0.8425	0.8294	0.8163	0.8031	0.79	0.7769	0.7638	0.7506	0.7375
1.7	0.9974	0.9869	0.9738	0.9606	0.9475	0.9344	0.9213	0.9081	0.895	0.8819	0.8688	0.8556	0.8425	0.8294	0.8163	0.8031	0.79	0.7769	0.7638	0.7506	0.7375
1.8	0.9974	0.9869	0.9738	0.9606	0.9475	0.9344	0.9213	0.9081	0.895	0.8819	0.8688	0.8556	0.8425	0.8294	0.8163	0.8031	0.79	0.7769	0.7638	0.7506	0.7375
1.9	0.9974	0.9869	0.9738	0.9606	0.9475	0.9344	0.9213	0.9081	0.895	0.8819	0.8688	0.8556	0.8425	0.8294	0.8163	0.8031	0.79	0.7769	0.7638	0.7506	0.7375
2	0.9974	0.9869	0.9738	0.9606	0.9475	0.9344	0.9213	0.9081	0.895	0.8819	0.8688	0.8556	0.8425	0.8294	0.8163	0.8031	0.79	0.7769	0.7638	0.7506	0.7375

The bank determine his deposit to loans ratio on first vertical column and equity to assets ratio on first horizontal raw so the bank will be able to determine the CAR.

3-4-2 The application results

The regression analysis results are shown on the table below at 95% confidence Auto correlation :

	Coefficients	Standard Error	t Stat	p Value	R Squared	Coefficient	Intercept
Intercept	0.071	0.004	17.170	0.00%			
Net Assets	0.000	0.000	-4.115	0.92%	0.70%	0.00	0.09
Total Deposits	0.000	0.000	3.901	1.14%	0.65%	0.00	0.09
Total Equity	0.000	0.000	2.992	3.04%	0.50%	0.00	0.09
Retained Earnings	0.000	0.000	-1.992	10.29%	0.43%	0.00	0.09
Dividends received	0.000	0.000	3.628	1.51%	76.35%	0.00	0.06
Net Loans	0.000	0.000	-3.976	1.06%	0.68%	0.00	0.09
Net Income After Extra ordinaries	0.000	0.000	-5.824	0.21%	0.35%	0.00	0.09

The results show that 93.47% on average on 4 years, of the changes in capital adequacy can be explained by the independent variables.

Regression analysis results on 2017 for example;

Equation Parameters

R Squared	0.9896
Adjusted R Squared	0.9751
Standard Error	0.0074
F - Statistic	67.9951

97.51% of the change in Capital Adequacy Results can be explained by the change in the 43 independent variables

to +/- on result of Regression Equation

Therefore analysis is Significant

95% Confidence/Autocorrelation

1.965	**Durbin-Watson Statistic**
0.20 - 2.57	**No autocorrelation detected**
2.913	**Critical F-Statistic - 95% Confidence**
93.23%	**Confidence to which analysis holds**

Conclusion

From the previous analysis it is important to clarify the results as fallow;

From the point of Modigliani & Miller (1995), that in a an ideal world, where no tax deductibility of debt exists and all information is instantly available to everybody, the value of a firm is independent of its capital structure. However in real world, an optimal capital structure can be achieved to maximize the value of a firm, this is due to the deviations from the ideal world.

To operationalize the capital requirements we use the two ratios that BASEL III imposes on banks: the total equity to assets ratio and loan to deposit ratio. Both ratios are calculated by assuming values which leads to stable ratios on all banks. The results appears to be same As capital requirements to be 8%. Which on our opinion the same as 10.5% in order to comply with the BASEL requirements. The same ratio is independent variables of interest that measures liquidity requirements. The following formulas are used to calculate both measures.

Capital adequacy is an important parameter for judging the strength and soundness of banking system. Banks with reasonable capital-to-risk weighted assets ratio (CRAR) can absorb the unexpected losses easily and their cost of funding is also reduced which ultimately improve the profitability of banks. The given study revealed that

The outcome of the module founded that;

- Increasing equity to assets ratio with high deposit to loan ratio, reflects a good bank's position to cover its credit risk. Where increasing capital have a positive relation with liquidity. But in the same time may effect on the share price, but on the long run will have a positive relation as a reason it protect bank from unexpected risks. That means, attempts of banks to consolidate liquidity will affect negatively on the profitability, as a reason that funds should be invested in ventures, must be kept to enhance liquidity position.
- Increasing dividends may have a negative effect on capital adequacy. That means; the dividends considered as one of the sources to finance the capital activities "loans and investments". Where increasing the dividends ratio will increase the price of share but on the other side, may have a conflict with capital requirements.

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