

RELATIONSHIP BETWEEN EPS AND CRAR

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ABSTRACT

This paper examines the compliance of Basel II and the RBI Guidelines with regard to Capital to Risk Weighted Assets Ratio (CRAR) and relation of EPS and CRAR of private bank. We have used published data for five years i.e., from 2017-2018 to 2021-22 for analysis. The application of Welch's t test has proved that there exists direct relationship between EPS and CRAR. The higher the EPS, the higher is the CRAR and vice versa indicating that the bank is making efficient utilization of invested capital and has adequate liquidity to meet all its obligations on time in a cost effective manner.

KEYWORDS: *Efficient, Utilization, Invested, Adequate, Liquidity, Obligations, Consisting.*

INTRODUCTION

The Basel Committee on Banking Supervision was established in 1974 by the Bank of International Settlements (BIS), an international organization founded in Basel, Switzerland in 1930. It is a committee of bank-supervisors consisting of members from the G10 countries. It is represented by central bank governors of the G10 countries. The Committee's members are from Belgium², Canada,³ France, Germany, Italy, Japan, Luxembourg, Netherlands, Spain*, Sweden, Switzerland, UK and US. The first accord was known as the Basel I. It was issued in 1988 and focused mainly on credit risk by creating a bank asset classification system. This classification system grouped a bank's assets into five risk categories: 0%, 10%, 20%, 50% and 100%. The bank must maintain capital equal to at least 8% of its risk-weighted assets, Tier 1 and Tier 2 capital. For example, if a bank has risk-weighted assets of Rs. 100 million, it is required to maintain capital of at least Rs. 8 million.⁴ The accord was replaced with a New capital adequacy framework (Basel II), published in June 2004. The second accord focuses on operational risk along with market risk and credit risk. Basel II attempted to correct the anomalies existing in Basel I. The greater the risk to which a bank is exposed, the greater is the amount of capital required to protect its solvency and overall stability. It will also force banks to enhance disclosures, which will help create more transparency and trust in the banking system itself.

Basel II is based on 3 pillars that allow banks and supervisors to evaluate properly the various risks that banks face.⁵ these three pillars are:

- (i) **Pillar 1:** Minimum capital requirements – It includes 3 risks. Credit risk + operational risk + market risk. Credit risk is the risk of loss due to a debtor's non-payment of loan or principal amount or interest or both. As per Basel II two ways of measuring credit risk namely standardized approach and Internal Rating Based Approach. An operation risk is a risk arising from execution of a company's business functions. It includes fraud risk, legal risk, physical or environmental risks, etc. Banks can choose any method of calculating the capital charge for operational risk – Basic Indicator Approach, Standardized approach and advanced measurement approaches. Market risk is the risk that the value of portfolio, either an investment portfolio or a trading portfolio will decrease due to the change in value of the market risk factors. The four standard market risk factors are stock prices, interest rates, foreign exchange rates and commodity prices. The approach of measuring is VAR (Value of Asset Risk).
- (ii) **Pillar 2:** Supervisory review of an institution's capital adequacy and internal assessment process. It also provides a framework for dealing with all the other risks a bank may face, such as systemic risk, pension risk, concentration risk, strategic risk, reputational risk, liquidity risk and legal risk, which the accord combines under the title of residual risk. It gives banks a power to review their risk management system.
- (iii) **Pillar 3:** This pillar aims to complement the minimum capital requirements and supervisory review process by developing a set of disclosure requirements which will allow the market participants to gauge the capital adequacy of an institution.

Capital Adequacy Ratio (CAR)

A measure of a bank's capital. It is expressed as a percentage of a bank's risk weighted credit exposures. It is also known as "Capital to Risk Weighted Assets Ratio (CRAR)".⁶

This ratio is used to protect depositors and promote the stability and efficiency of financial systems around the world.

Tier I Capital: It is core capital; includes equity capital and disclosed reserves. It is mainly composed of stockholder's equity in the company.

Tier II Capital: It is secondary bank capital that includes items such as undisclosed reserves, general loss reserves, subordinated term debt, and more. The unpublished or hidden reserves of a financial institution that may not appear on publicly available documents such as a balance sheet, but are nonetheless real assets, which are accepted as such by most banking institutions. Undisclosed Reserves are generally described as such only in the banking industry as it applies to capital requirements and are designed as Tier 2 capital along with revaluation reserves and general provisions.

Risk-Weighted Assets: These include the total assets owned. The value of each asset is assigned a risk weight (for example 100% for corporate loans and 50% for mortgage loans) and the credit equivalent amount of all off-balance sheet activities. Each credit equivalent amount is also assigned a risk weight. Risk weighting adjusts the value of an asset for risk, simply by multiplying it by a factor that reflects its risk. Low risk assets are multiplied by a low number, high risk assets by 100% (i.e. 1).

RBI decided in April 1992 to introduce a risk asset ratio system for banks in India as a capital adequacy measure. Essentially, under the above system the balance sheet assets and other off-balance sheet exposures are assigned prescribed risk weights and banks have to maintain minimum capital funds equivalent to the prescribed ratio on the aggregate of the risk weighted assets and other exposures on an ongoing basis. The process of implementing Basel II norms in India is being carried out in a phased manner. Phase I has been carried out for foreign banks operating in India and Indian banks having operational presence outside India with effect from March 31, 2008. In phase II, all other scheduled commercial banks (except Local Area Banks and RRBs) were to adhere to Basel II guidelines by March 31, 2009. The minimum capital to risk-weighted asset ratio (CRAR) in India is placed at 9%, one percentage point above the Basel II requirement. All the banks have their Capital to Risk Weighted Asset Ratio (CRAR) above the stipulated requirement of Basel guidelines (8%) and RBI guidelines (9%). As per Basel II norms, Indian banks should maintain tier 1 capital of at least 6%.⁷

The RBI decided that banks may use the ratings of the following domestic / international credit rating agencies for the purpose of risk weighting their claims for capital adequacy purposes:⁸

- a) Credit Analysis and Research Ltd.
- b) CRISIL Ltd.
- c) ICRA Ltd.
- d) FITCH Ltd.
- e) Moody's and
- f) Standard and Poor's

Banks must disclose the names of the credit rating agencies that they use for the risk weighting of their assets, the risk weights associated with the particular rating grades as determined by RBI for each eligible credit rating agency as well as the aggregated risk weighted assets. Keeping in view RBI's goal to have consistency and harmony with international standards, it has been decided that all commercial banks in India shall adopt Standardized Approach (SA) for credit risk and Basic Indicator Approach (BIA) for operational risk. Banks shall continue to apply the Standardized Duration Approach (SDA) for computing capital requirement for market risks.

The Government of India has emphasized that public sector banks should maintain CRAR of 12%. For this, it announced measures to re-capitalize most of the public sector banks, as these banks cannot dilute stake further, as the Government is required to maintain a stake of minimum 51% in these banks.

Earnings per Share:

The portion of a company's profit allocated to each outstanding share of common stock. Earnings per share serve as an indicator of a company's profitability.

$$\text{EPS} = \text{Net Income after tax} / \text{Weighted average number of shares.}$$

For the purpose of calculating basic earnings per share, the net profit or loss of the period attributable to equity shareholders should be the net profit or loss for the period after deducting preference dividends and any attributable tax thereto for the period. All items of income and

expense which are recognized in a period, including tax expense and extraordinary items, are included in the determination of the net profit or loss for the period unless an Accounting Standard requires or permits otherwise {Accounting Standard- AS 5, Net Profit or Loss for the Period, Prior Period Items and Changes in Accounting Policies}.⁹ The amount of preference dividends and any attributable tax thereto for the period is deducted from the net profit for the period (or added to the net loss for the period) in order to calculate the net profit or loss for the period attributable to equity shareholders.

For the purpose of calculating basic earnings per share, the number of equity shares should be the weighted average number of equity shares outstanding during the period. The weighted average number of equity shares outstanding during the period reflects the fact that the amount of shareholders' capital may have varied during the period as a result of a larger or lesser number of shares outstanding at any time. It is the number of equity shares outstanding at the beginning of the period, adjusted by the number of equity shares bought back or issued during the period multiplied by the time-weighting factor. The time-weighting factor is the number of days for which the specific shares are outstanding as a proportion of the total number of days in the period; a reasonable approximation of the weighted average is adequate.

OBJECTIVE OF THE STUDY

1. To study the relationship between EPS (Earnings Per Share) growth rate and CRAR (Capital to Risk Weighted Assets Ratio).

SCOPE AND METHODOLOGY

The study is based on ICICI Bank's five years financial data, viz., 2017-2018, 2018-2019, 2019-2020, 2020-2021 and to 2021-2022 taken from its published annual reports. To test the relationship between EPS (Earnings Per Share) growth rate and CRAR (Capital to Risk Weighted Assets Ratio) to apply Welch's t test. Welch's t test is gainfully used when two sample sizes are small / equal and variances of two samples are same. It is Non Parametric test and used when sample size is less than or equal to 30 and the variances of two samples are the same . We use the formula :

$$n_1 = n_2 \text{ and } s_1 = s_2$$

$$\text{Then } df = n_1 + n_2 - 2$$

If condition fulfills then apply t formula

$$t = \frac{\frac{x_1 - x_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}}{\frac{\text{Difference between mean}}{\sqrt{\frac{\text{Variances}}{N_1} + \frac{\text{Variance}}{N_2}}}}$$

To test the hypothesis, we compare the calculated value to the table value for the significance level of 0.05. If the calculated value \geq table value, we reject the null hypothesis or $P(\text{ItI}) \leq .05$ If the calculated value $<$ table value, or $P(\text{ItI}) \geq .05$ we fail to reject the null hypothesis.

FINDINGS

Capital Adequacy Ratio represents the financial soundness of Banks. In the case of ICICI Bank, the Capital to Risk Weighted Assets Ratio (CRAR) has been found to be much above 9% stipulated CRAR norm under Basel II as well as RBI during all the five years of study i.e., 2017-2018 to 2021-2022. During these year including pandemic period bank maintains capital adequacy ratio above 9% indicates that the bank is in comfortable position to absorb losses and also the compliance of the Basel II and the RBI norms.

As regards the relationship between Earnings Per Share (EPS and Capital Risk Adequacy Ratio (CRAR). We have found that there exists direct relationship between these. Higher the EPS higher is the CRAR or Lower the EPS lower is the CRAR. (See Table 1)

TABLE 1 : RELATION BETWEEN EPS AND CRAR DURING THE YEARS 2017-2018 TO 2021--2022

Year	EPS(RS)	CRAR
2017-2018	10.56	18.42%
2018-2019	5.23	16.89%
2019-2020	12.28	16.11%
2020-2021	24.01	19.12%
2021-2022	33.66	19.79%

Source: Annual Report

To bring the uniformity in data, converts EPS in to percentage. The following procedure follows:

1. Subtract the initial EPS from the Final EPS
2. Divide the change in EPS by the initial EPS.
3. Multiply the result in to 100 as a percentage.

For EPS growth rate as a percentage requires the EPS of the year 2016-2017 is Rs 15.31

The Welch's t – test has shown as under :

Null Hypothesis : There is no significant relationship between Variable X (EPS) and Variable Y (CRAR)

Alternative Hypothesis : We may, therefore conclude that earnings per share has direct relationship with CRAR. Higher the EPS, higher is the CRAR and vice-versa

The above can be explained by the fact that when EPS increases, it is as a result of increase in net profit after tax which ultimately adds to shareholders' funds to the extent profit not distributed by way of dividends. It also enhances the Tier 1 capital which is the core capital of the bank. When Tier 1 capital increases, the bank's CRAR will also increase, other things remaining the same.

Welch's t – test

TABLE 2 : CALCULATION OF MEAN AND VARIANCE

Year	EPS (X)%	CRAR (Y)%	$(X - M_x)^2$	$(Y - M_y)^2$
2017-2018	31	18	552.36	0.00
2018-2019	51	17	376.36	1.00
2019-2020	134	16	4044.96	4.00
2020-2021	96	19	655.36	1.00
2021-2022	40	20	924.16	4.00
Total				

$$\begin{aligned}
 N_1: & 5 \\
 df_1 = N - 1 & = 5 - 1 = 4 \\
 M_1: & 70.4 \\
 SS_1: & 7553.2 \\
 s^2_1 = SS_1 / (N - 1) & = 7553.2 / (5 - 1) = 1888.3
 \end{aligned}$$

$$\begin{aligned}
 N_2: & 5 \\
 df_2 = N - 1 & = 5 - 1 = 4 \\
 M_2: & 18 \\
 SS_2: & 10 \\
 s^2_2 = SS_2 / (N - 1) & = 10 / (5 - 1) = 2.
 \end{aligned}$$

$$t = \frac{x_1 - x_2}{\sqrt{\frac{S^2_1}{n_1} + \frac{S^2_2}{n_2}}} \quad \begin{array}{l} \text{Difference between mean} \\ \text{Variance Sample size} \end{array}$$

n_1 = number of subject in sample 1

n_2 = number of subject in sample 2

$$S^2_1 = \text{variance of sample 1} = \frac{\sum (x_1 - \bar{x}_1)^2}{n_1 - 1}$$

$$S^2_2 = \text{variance of sample 2} = \frac{\sum (x_2 - \bar{x}_2)^2}{n_2 - 1}$$

2

$n_2 - 1$

$n - 1$ used since $n < 30$

T-value			Calculation
$s_p^2 = ((df_1/(df_1 + df_2)) * s^2_1) + ((df_2/(df_2 + df_2)) * s^2_2) = ((4/8) * 1888.3) + ((4/8) * 2.5) = 945.4$			
$s^2_{M1} = s^2_p/N_1 =$	945.4/5	=	189.08
$s^2_{M2} = s^2_p/N_2 =$	945.4/5	=	189.08
$t = (M_1 - M_2)/\sqrt{(s^2_{M1} + s^2_{M2})} = 52.4/\sqrt{378.16} = 2.69$			

To test the hypothesis, we compare the calculated value to the table value for the significance level of 0.05 with 8 df. (degree of freedom).

In our case, the calculated value was 2.69 with 8 df and the table value for the .05 with 8df was ± 2.306 . Since $|2.69| > |2.306|$ we reject the null hypothesis or The t -value is 2.69. The p -value is 0.273. The result is significant at $p < .05$ and conclude that higher the EPS, higher the CRAR. The EPS will increase if the percentage growth in profit is higher than the percentage increase in shares. The EPS growth rate is more important than growth in net profit, especially in a period when additional shares are issued. It is also used to analyse the bank's earning from year to year as well as forecast future growth earnings.

CONCLUSIONS

CRAR is the ratio that a regulator in banking system use to watch bank's health especially bank's capital to its risk. EPS is an accounting method that is used as a measure of corporation's profitability that reveals how much profit a company generates with the money raised from shareholder. CRAR also assesses the adequacy of the liquidity of the banks and ensures that the banks have adequate cash flow to meet all obligations on time in a cost effective manner. CRAR protects depositors and maintains confidence in the banking system. EPS indicates the earnings available for shareholders. Higher the EPS, the more efficient the bank in utilizing invested capital. Basel II provides strength for development of the existing standards by banks, strong asset base that helps in bigger growth, advancement of technology and increasing risk measures, inability to meet the additional capital requirements, huge investments in technologies and presence of smaller banks needs to be tackled.

Basel II has developed to address the deficiencies in financial regulation revealed by the late 2000's financial crisis. Basel II would strengthen bank capital requirements and new regulatory requirements on bank liquidity and bank leverage. It proposes a stronger regulatory framework which comprises five key elements:

- a) Better quality of capital
- b) Better liquidity management and supervision

- c) Better risk management and supervision including enhanced pillar 2 guidelines.
- d) Enhanced pillar 3 disclosures related to securitization, off balance sheet exposures and trading activities to promote transparency, and
- e) Cross border supervisory cooperation.

It is hoped that the new regime, called **Basel III**, would take care of the deficiencies in the financial system to avoid future failures. The Basel III reforms have been proposed to be implemented with effect from **1 January 2023**

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