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**IMPACT OF CHANGES IN INTEREST RATE ON BANK PROFITABILITY: A RE-EXAMINATION**

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**ABSTRACT**

*The relationship between changes in the rate of interest and the profitability of commercial banks is well researched, though not conclusively established. Consequently, banking literature is replete with call for further research to assess the impact of variations in the rate of interest on the profitability of banks. Addressing this concern, the present study examines the relationship between changes in interest rate and bank profitability in the Indian context. Correlation between profit after tax figures collected from the financial statements of three private sector and three public sector Indian banks, and changes in rate of interest is calculated to assess the association between bank profitability and rate of interest. Results indicate a strong negative correlation between bank profitability and rate of interest. The findings of the study have been integrated with existing literature and the current macroeconomic environment. Implications for commercial banks, the central bank and the economy are discussed.*

**KEYWORDS**

india, bank, interest rate, profit.

**JEL CLASSIFICATION**

G00, G21.

**INTRODUCTION**

With the compounded annual growth rate in double digits (IBEF, 2015), the Indian banking sector is among the fastest growing sectors of the economy. Thanks to the rapidly expanding gross domestic product, rise of the middle class, technology solutions that focus on leveraging digital channels (Sandhu and Singh, 2016), and regulatory changes such as the newly licensed payments banks, the proposed Post Bank of India and the ambitious Pradhan Mantri's Jan Dhan Yojna (Singh et al., 2016), the Indian banking industry at present is worth US \$ 1.31 trillion (Beri, 2016). Looking ahead, it is poised to become the third largest banking industry of the world by the year 2025 (Beri, 2016).

The ever-increasing size of the Indian banking industry holds the promise of high profits for its players. As of 2016, there are 26 public sector banks, 20 private sector banks and 43 foreign banks operating in India. Many more domestic and foreign banks are likely to join this list in the coming years.

The huge profit potential of the Indian banking industry has not only aroused the interest of potential participants, but also of researchers and scholars. Many studies have been conducted to scrutinize the factors that impact bank profitability and help banks sustain high margins (Sharma and Mehta, 2005; Varadarajan and Berry, 2007; Goyal, 2008; Singh and Sandhu, 2016). Previous investigators have delved into numerous factors and variables that have a bearing on the profits of banks (Tiwari et al., 2006; Vyas and Math, 2006; Deltuvaite et al., 2007; Johnson, 2008; Sarma, 2008). However, of concern to the current study is the impact of changes in rate of interest on bank profitability.

Therefore, the present study is an attempt to assess the impact of changes in the rate of interest on the profitability of Indian banks. The present study contributes to the literature on banking in the following ways. First, it addresses the call for further research to examine the influence of variations in interest rate on bank profits (Lileikiene and Likus, 2011). Second, it re-examines the existing evidence in the Indian context. While banking literature is replete with studies that assess the relationship between interest rate and bank profitability (Pesek, 1970; Flannery, 1983; Hancock, 1985), the authors came across limited research on the same in the Indian context. The above arguments and gaps make a compelling case for the present study. Implications for commercial banks, the central bank and the economy are discussed.

**THEORETICAL FRAMEWORK****INTEREST RATE AND THE ECONOMY**

The rate of interest is a major determinant of the liquidity of an economy. In general, the rate of interest is increased to combat the negative effects of inflation (Ahuja, 2015). By encouraging aggregate savings, an increase in the rate of interest reduces the total amount of money in circulation. This pull out of money negatively impacts the liquidity position of the economy. The ultimate aim behind this move is to depress consumption by discouraging loans and credit. On the other hand, interest rate is reduced to lower the cost of borrowing and escalate liquidity and demand in the economy (Agarwal and Tathagath, 2013). This expands the total business activity of the economy and ushers in growth. For this reason, many critics believe that a reduction in the rate of interest is a prerequisite for economic development and prosperity (Petinger, 2013; Dornbusch et al., 2014).

As evident from the above discussion, the relation between the rate of interest and economic growth is well established and undisputed in economic literature. However, the relation between rate of interest and bank profitability is subject to a lot of scholarly contradictions. The next section sheds light on the same.

**INTEREST RATE AND BANK PROFITABILITY**

The determinants of bank profitability can be primarily divided into two categories – internal determinants and external determinants. While internal determinants of bank profitability constitute of variables that can be actively controlled by the bank and its policy objectives (Staikouras and Wood, 2005), the external determinants of the profitability of a bank are quite another story. Previous researchers have attempted to examine the impact of both the internal (Molyneux and Thorton, 1992; Molyneux, 1993; Berger, 1995; Zimmerman, 1996), as well as the external factors (Samuelson, 1945) on bank profitability. However, in this study we are only interested in examining the relationship between one particular external factor - rate of interest and bank profitability.

Samuelson (1945) was among the pioneers who attempted to comprehend the influence of changes in the rate of interest on the profits of banks. In his seminal study, he established that under ordinary conditions, the profits of banks tend to increase with an increase in the rate of interest. He opined, "the banking system as a whole is immeasurably helped rather than hindered by an increase in interest rate." Later researchers attempted to build upon his work. Revell (1980), as a part of a larger study proved that only the banks with aggregate loans greater than aggregate deposits stand to gain from an increase in the rate of interest. Since the interest earned on assets is a source of income for the bank, and interest paid on deposits a liability leading to outflow of funds, banks are likely to benefit from an interest raise only if the quantum of bank assets is greater than the quantum of bank liabilities. Thistle et al. (1989) seconded these findings by establishing



the impact of both an increase and decrease of interest rate on bank profitability and Hoggarth et al. (1998) suggested that monetary policy induced changes in rate of interest can lead to huge losses or unanticipated extraordinary profits for banks.

Further, many researchers also tried to recommend measures to avert the unwanted effects of fluctuations in interest rate on bank profitability. Goltz (2005) advocated attempts to predict interest volatility and the subsequent adoption of protective measures, and Mato (2005) suggested interest rate immunization with the help of derivatives.

If we categorically review the recent studies conducted in emerging/less-developed economies, we come across a number of relevant studies. As a part of a comprehensive research on commercial banks, Rasiah (2010) exhibited that interest rates play a major role in determining the profitability of a bank in Malaysia. Based on secondary data, Tarus et al. (2012) and Ayanda et al. (2013) established that changes in interest rate significantly impact the profits of banks in Kenya and Nigeria respectively. Similarly, Khan and Sattar (2014) scrutinized the financial statements of four Pakistani commercial banks to prove a strong negative relation between the rate of interest and bank profitability.

As can be seen, the relation between bank profitability and interest rate is well researched, though not conclusively established in literature. Furthermore, this topic is relatively unexplored in the Indian context. These observations justify the need for the present study.

**METHODOLOGY AND RESULTS**

The current study quantitatively examines the relationship between changes in interest rate and the profits of banks. Data related to the profits of banks was gathered from a sample of six banks, three from the private sector and three from the public sector. These banks include ICICI Bank, HDFC Bank, Axis Bank, State Bank of India, Union Bank of India and Bank of Baroda. Profit after tax figures of these banks were collected from their annual reports published on the official bank websites in the last five years (2011 to 2015) (for profit after tax figures refer to table 1). These figures were averaged to arrive at the average profit after tax for each of the six banks. On the same lines, figures for changes in the rate of interest during the same period were collected from the official website of the Reserve Bank of India (for data capturing the changes in the rate of interest refer to table 1). As recommended by previous scholars, Pearson Correlation Method was used to examine the impact of changes in the rate of interest on the profitability of banks (Zikmund, 1994, as cited in Sandhu and Sandhu, 2012; Khan and Sattar, 2014). The following formula was used:

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{(\sqrt{(n \sum x^2 - (\sum x)^2)(n \sum y^2 - (\sum y)^2)})^{1/2}}$$

**TABLE 1: ANNUAL PROFITS AFTER TAX (in crore rupees) AND RATE OF INTEREST**

Bank Name	Years				
	2011	2012	2013	2014	2015
ICICI Bank	5,151.38	6,465.26	8,325.47	9,810.48	11,175.35
HDFC Bank	3,926.40	5,167.09	6,726.28	8,478.38	10,215.92
Axis Bank	3,388.49	4,242.21	5,179.43	6,217.67	7,357.82
State Bank of India	8,264.52	11,707.29	14,104.98	10,891.17	13,101.57
Bank of Baroda	4,241.68	5,006.96	4,480.72	4,541.08	3,398.44
Union Bank of India	2,081.95	1,787.14	2,157.93	1,696.20	1,781.64
<b>Average Profit After Tax</b>	4,509.07	5,729.33	6,829.14	6,939.16	7,838.46
<b>Rate of Interest</b>	7.75	8.50	7.50	8.00	8.00

Source: Official websites of banks/RBI

**TABLE 2: RELATIONSHIP BETWEEN RATE OF INTEREST AND BANK PROFITABILITY**

Year	Rate of Interest	% Change in the Rate of Interest	Average Profit After Tax	% Change in Profit After Tax	Correlation
2011	7.75	---	4,509.07	---	
2012	8.5	9.68	5,729.33	27.06	
2013	7.5	-3.23	6,829.14	51.45	
2014	8	3.23	6,939.16	53.89	
2015	8	3.23	7,838.46	73.84	

Tables 1 and 2 exhibit the results of the study. The correlation between the changes in the rate of interest and bank profitability worked out to -0.52. This correlation establishes a strong negative relationship between the changes in the rate of interest and the profitability of banks. Therefore, the profits of Indian banks are likely to decrease in the event of an interest rate increase and vice-versa.

**DISCUSSION**

On inspection of the data, a negative correlation was found between the changes in interest rate and the profits of Indian banks. This implies that a reduction in the rate of interest increases the profits of Indian banks and vice-versa. Previous researchers opine that a negative relationship between these two variables – interest rate and bank profitability is either indicative of a huge spread (Khan and Sattar, 2014) or points towards a situation in which the liabilities of the banks are greater than their assets (Revell, 1980).

If we attempt to examine the current scenario, the Reserve Bank of India has consistently and successively reduced the rate of interest in the recent past. Also, there are speculations that the rate may fall further in the near future (The Economic Times, 2016). Therefore, profit-making opportunities are in the offing for Indian banks. Indian banks are likely to report higher profits in 2016. But, what remains to be seen is whether the reduced rate of interest will benefit the economy to an equal extent.

Economists fear that the advantages of the reduced interest rate may be localized only to the banking industry (Bloomberg, 2015). In 2015, Indian banks have been reluctant in passing on the reduced interest rate to the consumers. This practice is in synchronization with banking literature, which suggests that there is a substantial time lag between a reduction in the rate of interest and a reduction in the lending rate of banks (Khan and Sattar, 2014). Therefore, while the lowered interest rate has helped banks earn higher profits, it has not translated into growth benefits for the economy. So, when reducing the rate further, the Central Bank needs to proceed with caution. It must take due precautions to ensure that the advantages of the reduced rate are available to the entire economy and not just the banks. Appropriate measures to regulate the interest spread are called for.

Further, a comparison with the existing relevant literature indicates that the results of the present study refute the contentions of most of the studies conducted in the advanced economies (Samuelson, 1945). These studies indicate that there exists a positive relationship between changes in the rate of interest and bank profitability. On the other hand, the findings of the present study support the outcome of similar studies conducted in the less developed and emerging economies (Khan and Sattar, 2014). A comparable strong negative association between changes in the rate of interest and bank profitability is observed in a number of developing economies (Rasiah, 2010; Tarus et al., 2012; Ayanda et al., 2013; Khan and Sattar, 2014).

As is the case with every study, the present study too suffers from some limitations. The study examines the relationship between interest rate and profits of only six Indian banks over a limited period of five years (2011 to 2015). These limitations prevent generalization of the findings. Hence, the results of the current study may not be representative of the entire Indian banking sector.

Future researchers may conduct this study devoid of its limitations. They may also examine the impact of changes in interest rate on the profitability of private, public and foreign banks separately. An attempt can also be made to examine the relationship between non-interest income and bank profitability. Finally, though

this study has attempted to understand the reason behind the difference in the correlation between the study variables in the less developed and advanced economies, future investigators can delve deeper into these causes.

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