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Aims and Scope

The Journal of Accounting (JAC) is a peer reviewed academic journal. The main focus of our journal is to encourage research from areas of social and environmental critique, exploration and innovation as well as from more traditional areas of accounting, finance, financial planning and banking research. The Journal of Accounting covers a wide variety of topics including:

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- Accounting Information Systems
- Accounting Education
- Accounting for Non-profit Organizations
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Investment Preferences of Government Employees in Pambakuda

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ABSTRACT

As the circulation of blood is necessary for the survival of the individual, savings are necessary for unpredictable future emergencies in life. Savings means sacrificing the current consumption in order to increase the living standard and fulfilling the daily requirements in future. The savings can be done in different ways and one of the best ways of saving is to create an automatic saving plan. Savings play important role in making of the household and the national economy. The present study examines the investment awareness, preferences and the factors that are most concerned by government employees while selecting an investment avenue.

INTRODUCTION

As the circulation of blood is necessary for the survival of the individual, savings are necessary for unpredictable future emergencies in life. Savings means sacrificing the current consumption in order to increase the living standard and fulfilling the daily requirements in future. The savings can be done in different ways and one of the best ways of saving is to create an automatic saving plan. Savings play important role in making of the household and the national economy. It is necessary to have saving plan because it will help in meeting financial goals like secure future, children's education, meeting the demands of the family etc (Harshvardhan, 2013).

After meeting the basic requirements, the balance if any is kept as the saving which can be utilized for the future requirement. If the savings of the individual is kept in the home or locker, there will not be any return from the saving. Instead of keeping the savings idle without any income if it is invested outside, adequate income may be generated from the savings. Hence people try to invest the amount saved in various nature of investment to get maximum return (Ganapathi, 2014).

Investment refers to the commitment of funds to one or more assets that will be held over some future time period. Anything not consumed for today and saved for future use can be termed as investment (Deepak & Navdeep, 2015). Investment is the employment of funds with the aim of earning income or capital appreciation. It involves the commitment of resources which have been saved or put away from the current consumption in the hope that some benefits will accrue in the future. The investment avenues available can be categorized into financial investments and real investments. Real investments

are represented by tangible assets like residential house, gold etc. and financial investments include shares, debentures, mutual funds etc (Suchitra, 2015). The attitude of people towards investment varies with their age, educational level, occupation, income and so on.

REVIEW OF LITERATURE

The early research on income and savings of government employees found that public employees on average earned a higher income than employees in the private sector at the same level(Bassett & Micheal, 1998). A large proportion of households do not save adequately for retirement; when assuming that they want to maintain their pre-retirement level of consumption(Bernheim, 1998). The socio economic profile of the government employees constitutes a significant component in understanding the social structure of the society. The ever changing scenario with regard to income, expenditure and savings reflects changes in standard of living of the employees and quality of life(Thulasipriya, 2015).

Certain factors like education level, age of investors, number of family members etc make significant impact while deciding on the avenues for investment. Many of the individuals are saving money as bank deposits for the safety of an unpredictable future(Sathiyamoorthy & Krishnamurthy, 2015).Salaried women employees consider the safety as well as high return on investment on regular basis when they make investment(Santhi & Murugesan, 2016).

Teaching community has started realizing the importance of money and money's worth. They are initiated to prepare a budget for the proposed expenses and compare it with the actual expenses met by them, so that they are not influenced by other tempting and fashionable expenses(Umamaheswari & Suganthi, 2015). The income and investment are positively correlated and there is strong relationship between income and investment. Most of the individuals invest in tax saving investments(Ramanathan & Meenakshisunadaram, 2015). Indian investors even if they are of high income, well educated, salaried and independent are conservative investors prefer to play safe(Thulasipriya, 2015).

A bird eye view on the earlier studies shows that many studies were undertaken so far in the field of savings and investments of salaried class. But studies concerning the investment preferences of government employees in Pambakuda Grama Panchayath are rarely found in the literature.

SIGNIFICANCE OF THE STUDY

Pampakuda Grama Panchayath is a village on highlands and consists of rubber plantations. It has been declared as the first digitalized Panchayath in the state on 28.06.2014 by the then chief minister Sri.

Oommen Chandy. It is an ISO 9001-2008 certified Grama Panchayth. The digital database of the Panchayath includes the personal details of all residents such as occupation, education level, bank account number, aadhaar number, blood group, phone number and the availability of drinking water among other things. The database helps in the implementation of development plans in the Panchayath (Business Line, 2014). The Panchayath authorities introduce various schemes as per the socio economic back ground of the residents. The Grama Panchayath (study area) is featured by a good number of salaried employees belonging to government educational institutions and revenue offices. The study is expected to help the salaried employees to plan savings and investment towards maximizing the returns. The result of the study will also help the Panchayath authorities to work out various feasible schemes to mobilize finances from public sector salaried class. Hence the study is highly relevant in such digitalized Grama Panchayth.

STATEMENT OF THE PROBLEM AND SCOPE OF THE STUDY

The economy is prospering, the job market is booming and salaries are touching a new high. The new breed of youth has its pockets full and is intelligent enough not to let its money rust in bank accounts. Investment is on their mind and an option that has the potential to multiply their savings and provide maximum tax rebate is the one they crave(Yogesh & Charul, 2012). Savings provide the financial protection to the individual saver at the time of emergency. It is necessary to have saving plan because it will help in meeting financial goals like secure future, children education, meeting the demand of the family etc. The number of family members of the government employees plays an important role in the selection of investments. The investment objectives may tend to vary with variations in the number of family members of government employees. The scope of the present study covers the level of awareness, the factors most concerned and investment preferences of government employees in Pampakuda Grama Panchayath.

OBJECTIVES OF THE STUDY

1. To analyse the level of awareness of government employees as regards various investment avenues.
2. To identify the factors those are most concerned by the government employees while selecting a particular investment avenue.
3. To analyse the investment preferences of government employees.

HYPOTHESES OF THE STUDY

1. The respondents possess a moderate level of awareness as regards various investment avenues.
2. There is no significant difference between mean rank towards the factors that are most concerned while making investment.

3. There is no significant difference between mean rank towards the investment preferences of government employees.

METHODOLOGY

The study is empirical in nature and uses both secondary as well as primary data. The secondary data have been collected from articles and official websites. The primary data have been collected through the administration of structured questionnaire among 30 employees in various government offices in Pambakuda Grama Panchayath. Stratified random sampling technique has been applied to pick the samples. Initially, six government offices (six stratums) were arbitrarily selected (viz., (1)the Govt high school, Pampakuda, (2) Village Office Memmury, (3) Govt UPS Piramadam, (4) Govt HSS Pampakuda, (5) Govt UPS Onakkoor -north), Govt UPS, Onakkoor – south). Thereafter five employees each from all these institutions were picked(systematic sampling) and approached to gather primary data. The collected data have been analysed by using simple percentage, correlation, Friedman's test and one sample t-test.

RESULT AND DISCUSSIONS

The general profile of the respondents is shown in table 1. The table reveals that 53.3 percent of the respondents are males. A considerable number (40 percent) of the respondents belong to the age category of 30-40 years. Majority (83.3 percent) of the respondents is married and has graduate level (40 percent) educational qualification. Majority (83.33 percent) of the respondents works in education sector and the majority's' (70 percent) family size is three to six members. Many (60 percent) of them have up to two dependents and most (40 percent) of them earns up to Rs.30000 per month. The monthly family expenditure of the majority is in between Rs.25000 and Rs.30000. A considerable number (40 percent) of the respondents invest up to 15 percent of their disposable income.

Table 1: General profile of the respondents

Particulars		Frequency	Percentage
Gender	Male	16	53.3
	female	14	46.7
Age	Up to 30 years	6	20
	30-40 years	12	40
	40-50 years	9	30
	Above 50 years	3	10
Marital status	single	5	16.7
	married	25	83.3
Educational qualification	Higher secondary	9	30
	Graduation	12	40
	Post graduation	9	30
Occupation is in	Education sector	25	83.33
	Revenue	5	16.67

Family size	Up to 3	9	30
	3 to 6	21	70
Number of dependents	Up to 2	18	60
	2 to 4	12	40
Monthly family income	Up to 30000	12	40
	30000 to 35000	7	23.3
	35000 to 40000	8	26.7
	Above Rs. 40000	3	10
Monthly expenses	Up to Rs20000	4	13.3
	Rs. 20000 to 25000	8	26.7
	Rs.25000 to Rs.30000	15	50
	Above Rs.30000	3	10
Percentage of savings out of disposable income	Up to 15	12	40
	15-20	5	16.7
	20-25	3	10
	25-30	7	23.3
	Above 30	3	10

Source: field survey

Relationship between income and percentage of investment

An attempt has been made check the relationship if any in the income and percentage of investment of the respondents. For such purpose correlation analysis has been made. The hypothesis formulated in this respect and the test result is shown in table 2 below.

Ho: there is no significant relationship between income and percentage of investment of the respondents.

Ha: there is significant relationship between income and percentage of investment of the respondents.

Table 2: Correlation between income and percentage of investment

	Income	**Percentage of investment**
Income (Pearson's Correlation)	1	0.417
p-value		.022*
N		30

Source: Calculated from field data

Note: * denotes significant at five percent level of significance

From the table 2, it is clear that there is significant correlation between income and percentage of investment (correlation=0.417, p value=0.022). It means that one unit increase in income will lead to 0.417 unit increase in the percentage of investment of the respondents. Hence the null hypothesis is rejected at five percent level of significance.

Relationship between the number of dependents and percentage of investment

An attempt has also been made to check the relationship if any in the number of dependents and percentage of investment of the respondents. For such purpose correlation analysis has been made. The hypothesis formulated in this respect and the test result is shown in table 3 below.

Ho: there is no significant relationship between number of dependents and percentage of investment of the respondents.

Ha: there is significant relationship between number of dependents and percentage of investment of the respondents.

Table 3: Correlation between number of dependents and percentage of investment

	Number of dependents	Percentage of investment
Number of dependents (Pearson's Correlation)	1	-0.243
p-value		.019*
N		30

Source: Calculated from field data

Note: * denotes significant at five percent level of significance

From the table 3, it is clear that there is a significant negative correlation between number of dependents and percentage of investment (correlation= -0.243, p value=0.019). It means that one unit increase in the number of dependents will lead to a 0.243 unit decrease in the percentage of investment of the respondents. Hence the null hypothesis is rejected at five percent level of significance.

Awareness about various investment avenues

In order to assess the level of awareness of the government employees regarding various investment avenues, one sample t-test has been administered. The hypothesis in this regard and the test result is presented below:

Ho: the respondents possess a moderate level of awareness as regards various investment avenues.

Ha: the respondents do not possess a moderate level of awareness as regards various investment avenues.

Table 4: Awareness about various investment avenues

Investment avenues	*Mean value*	*SD*	*t-value*	*p-value*
Pension schemes	4.23	0.68	9.95	.001**
Stock market instruments	2.1	0.96	5.13	.001**
Mutual Funds	3.23	1.22	1.04	0.305
Insurance schemes (including postal life insurance)	4.63	0.49	18.25	.001**
GPF/EPF/PPF	4.63	0.49	18.25	.001**
Fixed/ recurring deposits (bank/post offices)	4.67	0.48	19.03	.001**
Gold /precious metals	4.67	0.48	19.03	.001**
Real estate	3.57	0.93	3.31	.002**
KSFE/other Chitties	4.17	0.75	8.55	.001**

Source: field survey

Note: ** denotes significant at 1 percent level of significance

Table 4 exhibits that the respondents possess good awareness as regards all investment avenues(p-value < 0.05 and mean value > 3.00) other than stock market instruments (p value = .305 and mean value < 3.00).Hence the null hypothesis is rejected and concluded that level of awareness of the government employees on various investment avenues is good. But they have only a poor level of awareness regarding the stock market instruments.

Factors most concerned by the government employees while making investment

In order to know about the factors that are most concerned by the government employees when they invest their hard earned money Friedman's test has been administered. The hypothesis formulated in this regard and the test result is presented below:

Ho: there is no significant difference between mean rank towards the factors that are most concerned while making investment.

Ha: there is significant difference between mean rank towards the factors that are most concerned while making investment.

Table 5: Factors most concerned while making investment

Factors most concerned	*Mean rank*	*Chi-square value*	*p-value*
Liquidity	1	75.88 (df:4)	0.001**
Return	3.03		
Safety of investment	3.63		
Capital Appreciation	3.68		
Tax consideration	3.67		

Source: field survey

Note: ** denotes significant at 1% level.

From table 5 it is seen that the factors that are most concerned by the government employees while making investment are capital appreciation (mean rank= 3.68), tax considerations (mean rank =3.67) and safety of investment (mean rank = 3.63). Hence the null hypothesis is rejected at five percent level of significance (Chi-square value = 75.88, df =4, p- value = 0.001).

Investment preferences of government employees

In order to examine the investment preferences of government employees in Pampakuda Grama Panchayath, Friedman's test has been administered. The hypothesis formulated in this regard and the test result is shown below:

Ho: there is no significant difference between mean rank towards the investment preferences of government employees.

Ha: there is significant difference between mean rank towards the investment preference of government employees.

Table 6: Investment preferences of government employees

Pattern	*Mean rank*	*Chi-square value*	*p-value*
Pension scheme	2.95	143.389 (df:8)	<0.001**
Stock market instruments	1.9		
Mutual fund	3.63		
Insurance schemes	7.23		
Provident funds	6.85		
Fixed/ recurring deposits	6.32		
Precious metals	5.55		
Real estate	3.45		
KSFE/other chitties	7.12		

Source: field survey

Note: ** denotes significant at 1% level

From table 6, it is seen that the most preferred investment avenues by the government employees are insurance schemes (mean rank= 7.23), KSFE/other chitties (mean rank = 7.12) Provident funds (mean rank = 6.85) and fixed/ recurring deposits (mean rank = 6.32). Hence the null hypothesis is rejected at five percent level of significance (Chi-square value = 143.389, df =8, p- value = 0.001).

Conclusion

In the nutshell, the awareness level of the government employees regarding investment avenues like insurance schemes, pension schemes, provident funds, precious metals, real estate, KSFE chitties, etc are high. But their awareness level regarding stock market instruments are low. Majority of them invest only up to 15 percent of their disposable income. Moreover, their preference towards pension schemes

is also low. This is not a good sign. As far as the government employees are concerned, during their service life, many of them will accomplish only two things- constructing a dream house and meeting the education and marriage expenses of their children. Thereafter the pension life of them may not be that much financially sound because of so many EMI payments and other obligations etc. It will be better if they would have participated in various pension schemes during their good days. Normally they require much money at their old age to meet their medical expenses and other health related things. Hence, keeping these facts in mind the government employees in Pampakuda Grama Panchayath should give little more preference towards various pension schemes which will automatically give them extra tax benefit also. Moreover they have to take measures to invest at least 30 percent of their disposable income in various investment avenues. As far as the Pampakuda grama panchayath is concerend, they can come up with attractive investment schemes especially for government employees or they can conduct awareness campaigns regarding investment avenues in collaboration with financial literacy centre in the concerned district.

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Corporate Governance Practices: A Comparative Study of Bank of Baroda & Yes Bank

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* (M. Com. & M. Phil)

ABSTRACT

It is a process set up for the firms based on certain systems and principles by which a company is governed. The guidelines provided ensure that the company is directed and controlled in a way so as to achieve the goals and objectives to add value to the company and also benefit the stakeholders in the long term. The high profile corporate governance failure scams like the stock market scam, the UTI scam, Ketan Parekh scam, Satyam scam, and recently Nirav Modi and Mehul Choksi scam which were severely criticized by the shareholders, called for a requirement to make corporate governance in India transparent as it greatly affects the development of the country. Poor corporate governance of banks has increasingly been acknowledged as an important cause of the recent financial crisis. Especially, the Basel Committee on Banking Regulation has already published two editions of a guideline entitled "Enhancing corporate governance for banking organizations" which easily reflects the supervisors' awareness of and approach to the issue Still, only during the next year of the financial crisis, the issue of banks' good corporate governance has again started to attract noticeable interest. For this purpose, this article examines the role of corporate governance in BOB&Yes Bank, which is the part of the public sector and private sector respectively. The study has conducted a case study on BOB&Yes banks to evaluation their corporate governance practices in India. The study efforts to see better corporate governance principals to better performance in both banks(BOB & Yes Bank).For this secondary data in the form of annual report has been taken from the bank's website. The Bank understands and compliments its fiduciary role and responsibility towards its shareholders and tries hard to meet their expectations. The Bank considers that best board practices, cleardisclosures and shareholder authorization are necessary for creating shareholder value. The philosophy on corporate governance is an important tool for shareholder protection and maximization of their long-term values. The Bank believes that good Corporate Governance is much more than complies with legal and regulatory requirements. The article got on a conclusion that corporate governance practices are more satisfactory in BOB as compared to Yes bank.

Keywords-: Corporate governance, banks, Code of conduct, Banking regulation, Board of director.

1. INTRODUCTION:

It is a process set up for the firms based on certain systems and principles by which a company is governed. The guidelines provided ensure that the company is directed and controlled in a way so as to achieve the goals and objectives to add value to the company and also benefit the stakeholders in the long term.

The high profile corporate governance failure scams like the stock market scam, the UTI scam, Ketan Parekh scam, Satyam scam, and recently Nirav Modi and Mehul Choksi scam which were severely criticized by the shareholders, called for a requirement to make corporate governance in India transparent as it greatly affects the development of the country.

Corporate governance in India gained prominence in the wake of liberalization during the 1990s and was introduced, by the industry association Confederation of Indian Industry (CII), as a voluntary measure to be adopted by Indian companies. It soon developed a compulsory status in early 2000s through the introduction of Clause 49 of the Listing Agreement, as all companies (of a confident size) listed on stock exchanges were compulsory to comply with these norms. In late 2009, the Ministry of Corporate Affairs has released a set of volunteer guidelines for corporate governance, which address a myriad corporate governance issue.

These volunteer guidelines mark a reversal of the former approach, signifying the preference to revert to a volunteer approach as opposed to the more compulsory approach prevalent in the form of Clause 49. However in a parallel process, key corporate governance norms are currently being combined into an amendment to the Companies Act, 1956 and after Companies Act, 2013 is approved the corporate governance reforms in India would have completed two full cycles - moving from the voluntary to the mandatory and then to the voluntary and now back to the mandatory approach.

The Anglo-Saxon model of governance, on which the corporate governance framework introduced in India is primarily based on, has certain limitations in terms of its applicability in the Indian environment. For instance, the central governance issue in the US or UK is essentially that of disciplining management that has ceased to be effectively accountable to the owners who are dispersed shareholders.

However, in contrast to these countries, the main issue of corporate governance in India is that of disciplining the dominant shareholder, who is the principal block-holder, and of protecting the interests of the minority shareholders and other stakeholders.

Furthermore, given that corporate governance is essentially a soft issue, whose essence cannot be captured by quantitative and structural factors alone, one of the challenges of making corporate governance norms compulsory is the need to differentiate between form and content; for instance, how do we determine whether companies actually internalize the desired governance norms or whether they look at governance as a check-the-box exercise to be observed more in letter than in spirit.

Currently, corporate governance reorganizations in India are at a crossroads; while corporate governance codes have been drafted with a deep understanding of the governance standards around the world, there is still a need to focus on developing more appropriate solutions that would evolve from within and therefore address the India-specific challenges more efficiently.

This paper collects a history of the evolution of corporate governance reforms in India and through a survey of existing research, identifies issues that are peculiar to the Indian context and which are not being sufficiently addressed in the existing corporate governance framework.

Lastly, this paper suggests the need for strong research in the field of corporate governance research that would support policy formulation in order to make the next generation of corporate governance reforms more effective for the Indian conditions.

2. LITERATURE REVIEW:

According to Stiglitz, J. (2009), Banks have the exclusive ability to attract funding in the form of deposits that are fully insured up to a limit and thus insensitive to risk. Moreover, injurious banks are taken over by regulators instead of having to face bankruptcy in public courts. Assets are consequently sold to another institution or in case of multiple bidders, to the highest bidder.

Das and Ghosh (2004) attempted to establish a relationship between CEO compensation and bank performance in India. They concluded that CEOs of properly performing banks are likely to face higher turnover than the CEOs of well performing banks. As there is a lack of impact studies of corporate governance policy implementation on financial performance of the banks, more mainly in Indian context, this study is an attempt to block the gap.

As per the view of Cocris&Ungureanu (2007) banks are unique and their corporate governance systems are of major importance because banks have a critical position in the development of economies due to their major role in running the financial system. The banking industry is unique because it is all together consolidating and diversifying. There is a significant public dimension to the banking firms; bank managers function in the light of two distinct sets of interests: one is the private interest, internal to the firm, and the other is the public interest, external to the firm. This study put emphasis on the implications of banks' specific attributes on their corporate governance framework viz. greater opaqueness and greater regulation from the viewpoint of current economic framework and further it analysed the environment with increased regulation of the banking firm, as a governance control mechanism.

Mukherjee and Ghosh used only balance sheet information from four selected sectors of the Indian industry for their study. They analysed the efficacy of corporate governance. Their findings, by and large, painted a disappointing picture with the overall conclusion that corporate governance was still in a very emerging stage in the Indian industry.

Khanna and Palepu have argued that the globalization of product and talent markets has concerned corporate governance of firms in the Indian software industry. It did not appear that concentrated ownership in India was entirely associated with the problems that the literature has assigned to it in emerging markets.On the other hand, they felt that if the concentrated owners are not exclusively, or even primarily, engaged in rent-seeking and entry-deterring behaviour, concentrated ownership may not be opposed to competition.

Khanna's analysis recommends that enforcement is important to the growth of stock markets, but the active civil enforcement of corporate laws may not always be significant to their initial development.

Banking business is highly regulated businesses and supervision by the government and regulator. Banks are the important parts of economic reforms and development of the country (Gorkhali, 2010).

3. RESEARCH METHODOLOGY:

3.1 Introduction:

The research is emphasis on evaluating Corporate Governance in Bank of Baroda (BOB) which is the part of public sector banks and Yes bank which is the part of private sector bank and specifically, to examine the effectiveness of Corporate Governance in BOB and Yes Bank in achieving economic growth, bringing transparency of banking transactions, decrease malpractices and how it can be mandatory. So, the research methodology was prepared accurately to identify and comparing the effectiveness of Corporate Governance between BOB and Yes bank

3.2 Objectives of theStudy:

The main objective of this study is to regulate the Corporate Governance practices in the BOB&Yes bank. The study goals to classify the practices in different Corporate Governance issues. The present study also analyticallyexamines the governance usualin the banking sector in India more precisely the objective of the study isto: -

- To understand and evaluate the concept of corporate governance in BOB and Yes Bank.
- Classify the control environment and processes of the Corporate Governance in BOB&Yes Bank.
- Regulate the level of disclosure they exactness and timeline of the financial position, condition and the non-financial information of the BOB&Yes bank.

3.3 Sample Size:

Indian banking sector includes the varieties of banks that can be divided as public sector banks, private sector banks, foreign banks and Co-operative banks, payment bank etc. Though Corporate Governance fix to all types of banks but for specific focus, I have selectedBOB&Yes bank which one is the part of public sector banks and the second one is the part of the private sector bank.

3.4 Sources and Collection ofdata:

The work continued based on secondary data. Secondary data and information were collected from annual reports which are finding from different sources. The data and data used from annual reports of the financial year 2017-18. These Annual reports are simply available on websites of banks.

3.5 Hypotheses:

Ho: BOB &Yes bank is not showing maximum compliance towards corporate governance norms.
H1: BOB&Yes bank is showing maximum compliance/towards Corporate Governance norms.

4. ANALYSIS AND INTERPRETATION:

4.1 Introduction:

Through Annual report this study tries to find Corporate Governance practices in BOB &Yes Bank. This study is divided into seven parts each part is analyzing standing of Corporate Governance disclosures.

4.2 Shareholding Patten:

Share holding pattern is the structure of shares held by individual promoters or in other words public institutions, brokers etc. Shareholding pattern of 1 year the selected banks are shown in the following table. These studies will assistance in understanding the main shareholder group. Shareholding pattern is alienated into two categories-Promoter's Holding&Non-Promoters.

Table-4.1 Shareholding Pattern (For the year 2017-2018)

S. No.	Categories	BOB	Yes Bank
	Total Number of Shares in dematerialized form		
A	**Promoter's Holding**		
1	Promoters		
	Indian	64.03	12.08
	Foreign	-	-
2	Persons Acting in concert	-	-
3	Friends & Associates of Promoters	-	-
4	Bodies Corp.	-	8.11
	Sub-Total (A)	**64.03**	**20.19**

B	Non-Promoter's Holding		
1	Institutional Investors	-	-
	Mutual Funds	11.25	10.46
	Mutual funds & UIT	4.84	
	Banks & Financial Institutions	0.16	0.07
	Banks, financial Institutions, Insurance	-	12.73
	Banks Mutual funds & Financial Institutions	-	-
	LIC of India	2.54	
	GIC & other Nationalized GIC	-	
	Foreign Institutional Investors (FII)	13.94	46.65
	Foreign Financial Institutions (FFI)	-	-
	Sub-Total (B)	**32.73**	**69.91**
C	**Others**		
	Private Corporate Bodies	1.92	0.88
	Indian Public	0.33	7.72
	NRIs & OCBs	0.1	
	FII/OCB/NRT	-	-
	OCB/NRI/FB/FN	-	-
	FII/NRI/FB/FC/OCB/FN		
	GDRs	-	-
	ADS (Deutsche Bank Trust Company Americas)	-	-
F	Foreign Banks/Companies		
	Indian Companies	-	-
	Trusts	0.64	0.04
	HUF	0.14	
	Clearing Members	0.11	1.26
	Any Others	-	-
	Sub-Total (C)	**3.24**	**9.9**
	GRAND-TOTAL (A+B+C)	**100**	**100**

Source: Annual Reports of BOB & Yes Bank

- FB- Foreign Bodies
- FN- Foreign Nationals
- OCB- Overseas Corporate Bodies
- GDR- Global Depository Receipt
- ADS- American Depository Shares

Observation from Table 4.1

- Very high percentage of promoters in shareholdingof BOB but in Yes Bank Non promoters held moreshare.
- Insurance Companies & foreign Institutional investors also hold enough sharesin both Banks.

4.3 Board Structure Strength and Size:

According to the Birla Committee,1999 the board of the company has an ideal combination of executive and non-executive directors with not less than fifty percent of the board including the non-executive directors. The number of independent directors will depend on the nature of the chairman of the board. In case a company has a non-executive chairman at least one third of board should include of independent directors and in case a company has a managerial chairman of least half of board should be independent.

Following table 4.2 will show the board assembly strength and size of the BOB&Yes bank. This assessment will help in observing at what extent these banks complying with arranged rules and regulation.

Table –4.2 : Board Structure Strength and Size for the year 2017-18

S.No.	Categories	BOB	Yes Bank
I.	Total Number of Director	12	8
A	No. of Executive Directors	4	1
	Promoters	-	1
	Others	-	-
B	No. of Non-Executive Directors	8	6
II.	No. of Directors in Percentage		
	Executive Directors	**33%**	**25%**
	Non-Executive Directors	**67%**	**75%**

Observation from Table 4.2

- Both banks have an ideal combination of executive and non-executivedirectors.
- There is no information about independent director in BOB bank, but information provided by Yes Bank

4.4 Audit Committee:

It is required as per clause 49(II) of the listing agreement that a skilled and independent audit committee should be established by the board of a company which will improve transparent practices. Table 4.3 is established to check the audit committee status of the BOB and Yes bank.

Table –4.3: Status of Audit Committee of Bank For the year 2017 -18

S.No.	Particulars	BOB	Yes Bank
1	Transparency in composition of the committee	Total Members-5 1- Govt. nominee Director	Total Members -5
		1- RBI nominee Director 1-Executive Director	1-Non-Executive Director 4-Indipendent Director
		1-Non-Executive Director	
		1-Other Director	

2	Compliance of minimum requirement of number of IDs in the	No Data Provided about Independent Director in	Data Provided about Independent Director in
	committee	Corporate Governance Report	Corporate Governance Report
3	Compliance of minimum Requirement of the number of the committee meeting	Total meeting-15 3attended 15	Totalmeeting-6 6 attended6
		1 attended14	
		1 attended4 1attended0	
4	Information about literacy & financial expertise of the committee	Data providedin the corporate governance report	Data providedin the corporate governance report
5	Information about participation of head of finance, statutory auditors, Chief internal auditors, committee meetings	Data provided in the corporate governance Report	Data provided in the corporate governance report
6	Published of Committee report	Not published in corporate governance report	Not published in corporate governance report

Source: Annual Reports of BOB & Yes Bank

Observation from Table 4.3

- Both banks are filling up all condition of audit committee.
- Chairman of meeting was Non-ExecutiveDirectorin BOB as well asYes Bank.
- BOB and Yes Bank have not published committee report.

4.5 RemunerationCommittee:

A company must have a reliable and transparent policy in defining and accounting for the remuneration of the directors. The policy should avoid possible battles of interest between the shareholders, the directors the management. The over-riding principle in admiration of director's remuneration is that of frankness and shareholders are entitled to a full and clear statement of assistances available to the directors.

Table –4.4 : Status of Remuneration Committee For the year 2017-18

S.No.	Particulars	BOB	Yes Bank
1	Transparency in composition of the committee	Total Members-3 1- Govt. nominee Director	Total Members-3 Chairman-Non-Executive Director-1 Independent Director-2
		2- RBInominee Director	
		3- OtherDirector	
2	Information about Remuneration of Directors	Disclosed	Disclosed
3	Information about nature of complaint & queries received and disposed-item	Not disclosed item-wise break up. Not complaints pending reports	Disclosed item-wise break up.Not Complaints pending report
	Wise		
4	Information about number of committeesmettings	Total meeting-0	Total meeting-4 3 atended-4
5	Information about investors/ shareholder survey conducted	No such survey conducted	No such survey conducted
6	Publishing of committee reports	Not published in corporate	published in corporate
		governance reports	governance reports

Observation from Table 4.4

- There is no-information about non-executive director and independent director in transparency in conformation of the committee by BOB, but Yes Bank fulfilled all this information.
- BOB and Yes banks are disclosed Remuneration of directors in Annual report.
- No meeting held by BOB bank in a year, but Yes Bank met four meetings.
- BOB has not published committees report, but Yes Bank has published its report.

5. STATUTORY DISCLOSURES:

5.1 Disclosure and treatment of related party transactions:

As per the Birla Committee 1999, this is an important disclosure. A disclosure is to be made on substantially significant related party transactions i.e. transactions of the company of substantial nature, the directors or the management, with its promoters, their subsidiaries etc that may have potential clash with the interest of company at large.

5.2 Non-Compliance related to capital market:

Details of non-compliance by the company penalties and criticisms executed on the company by SEBI or any statutory authority on any substance related to capital market during the last three years should be relate in the annual report of the company.

5.3 Accounting Treatment:

As per the Narayan Murthy report (2003) on corporate governance companies, while making financial statements a treatment different from that arranged in an accounting standard has been followed, the fact should be disclosed in the financial statement, collected with the managements clarification as to why it believes such alternative treatment is more representative of the true and fair view of the highlighted business transaction.

Risk Management:

Management should place a report, before the entire board of directors every area documenting the business risk faced by the company dealings to address and minimize such risks and any restrictions to the risk-taking capacity of the corporation. This document shall be legally approved by the board.

According to Naresh Chandra Committee, 2009 the board, its audit committee and its executive management must jointly identify the risks impacting the company's business and document their process of risk identification, minimization, and risk optimization as a part of risk management policy

or approach. The board should also confirm that it has put in place grave risk management framework across the company which is supervised once every six months by the board.

5.4 Management Discussion and Analysis:

As a part of the statement related to management it is suggested that as part of the directors' report or as a gathering there to a management conversation and analysis report should form part of the annual report to the shareholders. This management conversation& analysis should include discussion on the following matters within the limit set by the company's competitive situation-

- Industry structure and expansions.
- Opportunities and Threats.
- Section wise or product wise performance.
- Output.
- Risks and anxieties.
- Internal control systems and their capability
- Conversation on financial performance with respect to effective performance.
- Material developments in Human Resources/Industrial Relations obverse including number of people employed.

5.5 Shareholders Information:

A. It is recommendatory that in case of the selection of a new director or reappointment of a director the shareholders must be provided with the following information-

- A brief CV of the directors
- Nature of his skill in specific functional areas
- Name of companies in which the persons also clasps the directorship and the membership of committees of the board.

B. Report like quarterly results, presentation made by companies to analysis may be lay on company's web-site or may be sent in such a form so as to permit the stock exchange on which the company is registered to put it on its web-site.

Table –4.5 : Item of Statutory Disclosures/Requirements and their status of Compliance for the Year 2017-18

Sr. No.	Disclosure Item	BOB	Yes Bank
1	Directors' Report	Yes	Yes
2	Auditors Report	Yes	Yes
3	Financial Statements	Yes	Yes

4	Schedules forming part of Financial Statements	Yes	Yes
5	Consolidated Financial Statements	Yes	Yes
6	Significant Accounting Policies	Yes	Yes
7	Notes on account	Yes	Yes
8	Details of Subsidiary companies	Yes	No
9	Related Party Disclosures	Yes	Yes
10	Segment Reporting	Yes	Yes
11	Risk Management	Yes	Yes
12	BASEL - III Disclosures	Yes	Yes
13	Dividend Details	Yes	Yes
14	Other Financial Performances	Yes	Yes

Observation from Table 4.5

Table 4.5shows the financial disclosures of the Bank of Baroda and Yes Bank. The Bank of Baroda fulfilled all the criteria of the financial disclosures with 100% compliance of financial disclosures. That shows the good governance practices of the bank. And Yes, bank only missing disclosure was Subsidiaries of the Yes Bank which was not available in the reports.

6. NON-MANDATORY DISCLOSURES:

Table –4.6 : Item of Non-Status Mandatory Disclosures/Requirements and their status of Compliance For the year 2017-18

Sr. No.	Disclosure Item	BOB	Yes Bank
1	Vision & Mission Statement	Yes	No
2	Message from the Chairman	Yes	Yes
3	Shareholders' Rights	Yes	Yes
4	Statutory Details of the company	Yes	Yes
5	Ownership/ shareholding Structure/ Pattern	Yes	Yes
6	Size of the Board	Yes	Yes
7	Composition of Board	Yes	Yes
8	Role & Functions of the Board	Yes	Yes
9	Changes in the Board Structure	Yes	Yes
10	Information about independent Directors	Yes	Yes
11	Brief Resumes of the Board Members	Yes	Yes
12	Number of Directorship hold by each Member	Yes	Yes
13	Number of Board Meetings	Yes	Yes
14	Attendance in Board Meetings	Yes	Yes
15	Director's Stock Ownership	No	Yes
16	Director Remuneration	Yes	Yes
17	CEO/CFO Certification	Yes	Yes
18	Chairman & CEO Duality	Yes	Yes
19	Audit Committee	Yes	Yes
20	Meetings and attendance of Audit Committee members	Yes	Yes
21	Remuneration & Nomination Committee	Yes	Yes
22	Stake Holders Relationship Committee	Yes	Yes
23	Risk Management Committee	Yes	Yes

24	Other Committees	Yes	Yes
25	Composition of the Committees	Yes	Yes
26	Functioning of the Committees	No	Yes
27	Organizational Code of Conduct	Yes	Yes
28	Auditor Fees	Yes	Yes
29	Auditor Appointment & Rotation	No	Yes
30	Vigilance Mechanism	No	Yes
31	Employee Relation/ Industrial Relation	Yes	No
32	Corporate Social Responsibility	Yes	Yes
33	Environmental Responsibility	No	No
34	Internal Control System	Yes	Yes
35	Notice and Agenda of the AGM	Yes	Yes
36	Separate CG Statement/ Section	Yes	Yes
37	Annual Report through Internet	Yes	Yes
38	Whistle Blower Policy Compliance Certificate from Auditor or Company	Yes	Yes
39	secretary for CG	Yes	Yes
40	Philosophy on Code of CG	Yes	Yes
41	Best Practices Recognition/ Award for CG	Yes	Yes

Observation from Table 4.6

- Table 4.6 shows the analysis of non-financial disclosures of Bank of Baroda. The non- financial disclosures where the Bank of Baroda is lacking are its Functioning of the Committees. Further, the bank had not disclosed the stock ownership by directors, auditors' appointment and rotation and environmental responsibility, Vigilance Mechanism. Thus, out of total 41 criteria, the Bank of Baroda had fulfilled the 36, and remaining were incomplete.
- The analysis of non-financial disclosures of Yes Bank. The non-financial disclosures where the Yes Bank is lacking are many. Like the bank has not disclosed vision and mission, so bank also lose its score. Further, the bank had not disclosed Employee Relation/ Industrial Relation, Environmental Responsibility. Thus, out of total 41 criteria, the Yes Bank had fulfilled the 38, and remaining were incomplete.

7. CONCLUSIONS:

- It is observed that BOB is keen implementing best practices with regard to Corporate Governance practices. The positive aspects of BOB and Yes Bank Corporate Governance practices include board Corporate Governance Viewpoint, requisite and sufficient number of board members with huge representation of non-executive directors. Another position aspect of BOB and Yes bank Governance practices in enhancing Corporate Governance practices year by year.
- Some negative aspects like not disclosing information on Director's Stock Ownership Auditor Appointment & Rotation, Vigilance Mechanism, Environmental Responsibility, and Vision& Mission Statement are not given in the annual report. The market leader of banking sector of India is BOB and Yes Bank, as India is a liberalized economy like all banks has to enhance its

Corporate Governance practices proactively to achieve excellence in Corporate Governance and financial performance.

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Evaluating Profitability Performance of Bajaj Auto Ltd & Hero Motocorp by using Dupont Model

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ABSTRACT

This study attempts to measure the financial performance of the Auto-mobile companies in India with respect to Bajaj Auto Ltd and Hero Motocorp. In this paper, researcher uses DuPont analysis, is method of assessing a company's return on equity (ROE) breaking into three parts i.e. Profit Margin (Profit/Sales), Total Assets Turnover (Sales/Assets) and Equity Multiplier (Assets/Equity). In order to achieve the goal, this study has measured the ratios of ROE, ROA applying the DuPont analysis, which have been demonstrated with tables and graphs to show the change periodically. DuPont analysis is based on analysis of Return on Equity (ROE) & Return on Investment (ROI). DuPont analysis (ROI and ROE) is an important tool for judging the operating financial performance. It is an indication of the earning power of the firm. The return on equity dis-aggregate performance into three components: Net Profit Margin, Total Asset Turnover, and the Equity Multiplier. The return on investment consists of Assets Turnover (Operating Income×Total Assets) and Profit Margin (EBIT×Operating Income). The researcher used't' test for analyzing and comparing previous 5 years financial data to find out level of significant change.

Keywords: DuPont Analysis, Return on Equity, Return on Investment, Financial Performance

INTRODUCTION

For any business in the private sector, there are numerous of models to describe how well the business is running. Among these the DuPont model was created in the early 1900s which is still a model valid to be used for assessment of the profitability. Using the DuPont model for risk analysis is not very common but if a risk analysis specialist wants to talk the language of business, it can be valuable.

The model was created by F. Donaldson Brown who came up with the model when he was assigned to clean up the finances in General Motors and has ever since been an important model for financial analysis. Remarkably it has not been used in the security community for risk prioritization or impact analysis. The original DuPont method of financial ratio analysis was developed in 1918 by an engineer at DuPont who was charged with understanding the finances of a company that DuPont was acquiring. He noticed that the product of two often-computed ratios, net profit margin and total asset turnover, equals return on assets (ROA). The elegance of ROA being affected by a profitability measure and an efficiency measure led to the DuPont method becoming a widely-used tool of financial analysis. In the 1970‟s, emphasis in financial analysis shifted from ROA to return on equity (ROE), and the DuPont model was modified to include the ratio of total assets to equity.-

Before discussing the mechanics and usefulness of Du Pont, it may be of some interest to learn about its development. The maturity of the Du Pont model parallels the progress made in the field of financial analysis itself. Three distinct versions of Du Pont have been created and used to help unravel the underlying drivers of profitability and return over time, beginning nearly 90 years ago.

In 1918, four years after he was hired by the E. I. DuPont Corporation of Wilmington, Delaware, to work in its treasury department, electrical engineer F. Donaldson Brown was given the task of untangling the finances of a company of which Du Pont had just purchased 23% of its stock. (This company was General Motors) Brown recognized a mathematical relationship that existed between the two commonly computed ratios, namely net profit margin (obviously a profitability measure) and total asset turnover (an efficiency measure), and ROA. The product of the net profit margin and the total asset turnover equals ROA, and this was the original Du Pont model, ROA (net income / sales) x (sales / total assets) = (net income / total assets).

SIGNIFICANCE OF THE STUDY

Investor‟s uses return on equity (ROE) to measure the earnings of a company generates from its assets. With it, they can determine whether a firm is profit-creator or a profit-burner and management‟s profit-generating efficiency. Why is this important to investors? Companies that are good at coaxing profits from their operations tend to have competitive advantages, which can translate into superior investment returns. The DuPont model is a useful tool in providing both an overview and a focus for such analysis. It can be used as a compass in the process by directing the analyst towards significant areas of strength and weakness evident in the financial statements. Hence, this research has taken for comparing previous 5 years profitability performance of the top two Automobile companies in India with respect to Bajaj Auto Ltd and Hero Motocorp by using DuPont.

LITERATURE REVIEW

Dr. Pravin Mahamuni & Dr. Anand Jumle (2016): This research paper is all about to measure and compare the profitability performance of the Automobile companies in India with respect to Tata Motors Ltd. and Mahindra & Mahindra Ltd. by using DuPont. In this paper, researcher uses DuPont analysis, is a method for assessing a company's return on equity (ROE) breaking it into three parts i.e. Profit Margin (Profit/Sales), Total Asset Turnover (Sales/Assets) and Equity Multiplier (Assets/Equity). it is concluded that the DuPont analysis made by calculating ROE and ROI for top two Indian automobile companies (the Tata Motors Ltd and Mahindra & Mahindra Ltd.) and result portrays that Mahindra & Mahindra Ltd. have better profitability performance rather than its compititors Tata Motors Ltd..

Brigham & Houston (2001): The modified model was a powerful tool to illustrate the interconnectedness of a firm‟s income statement and its balance sheet and to develop straightforward strategies for improving the firm‟s ROE. The Du Pont identity provides an excellent way to get a quick snapshot view of the overall performance of a firm in three critical areas of ratio analysis.

Milbourn & Haight (2005): Providing Students with an Overview of Financial Statements Using the Du Pont Analysis Approach- Du Pont Analysis as a teaching aid to equip students with an understanding of how management decisions influence the bottom line. Unfortunately, the Milbourn & Haight paper were concerned exclusively only with the original Du Pont model, i.e. it showed the drivers of no more than Return on Assets. They have shown the impact and value of the Du Pont model drivers on Return on Equity.

De Wet & Du Toit(2007):Return on Equity: A Popular, but Flawed Measure of Corporate Financial Performance-showed how ROE is calculated by taking the profit after tax and preference dividends of a given year and dividing it by the book value of equity (ordinary shares) at the beginning of the year. Average equity can also be used. Equity would consist of the issued ordinary share capital plus the share premium and reserves.

Nissim & Penman (2001): Ratio Analysis and Valuation: From Research to Practice- suggested using a modified version of the traditional DuPont model in order to eliminate the effects of financial leverage and other factors not under the control of those managers. Using operating income to sales and asset turnover based on operating assets limits the performance measure of the management to those factors over which management has more control.

Mihaela Herciu et al (2011): A DuPont Analysis of the 20 Most Profitable Companies in the World- attempted to demonstrate that in most cases the most profitable companies are not the most attractive for investors – through Du Pont Analysis method. In order to do this, they took into account the top 20 most profitable companies in the world in 2009 (according to Fortune). By using Du Pont analysis, they arrived at the results that ranking is not preserved when indicators (ratios) such as ROA (return on assets) or ROI (return on Investment), ROE (return on equity) or ROS (return on sales) are taken into consideration.

Ahmed Arif Almazari (2012): Financial Performance Analysis of the Jordanian Arab Bank by using the Du Pont System of Financial Analysis- attempted basically to measure the financial performance of the Jordanian Arab Commercial Bank for the period 2000-2009 by using the Du Pont system of

financial analysis which is based on the analysis of return on equity model and return on investment model. From this study it was found that, the financial performance of Arab Bank is relatively steady and reflects minimal volatility in the return on equity. Net profit margin and total asset turnover exhibit relative stability for the period from 2001 to 2009. The equity multiplier also showed almost stable indicators for the period from 2001-2005 and the ratios declined from 2006-2009 which indicated that the Arab bank had less financial leverage in the recent years, which means that the bank is relying less on debt to finance its assets.

McClure (2008: ROI and ROE Give Clear Picture of Corporate Health- Using Du Pont Analysis, presented that a common form of financial statement analysis, decomposes return on net operating assets into two multiplicative components: profit margin and asset turnover. These two accounting ratios measure different constructs and, accordingly, have different properties. Prior research has found that a change in asset turnover is positively related to future changes in earnings.

Prendergast (2006): Financial Analysis: How a Modified DuPont Approach to Ratio Analysis can be Used to Drill Down to the True Cause of Financial Performance Problems- Presented examples of using Du Pont analysis in both a business and classroom setting. The author illustrates how a „modified Du Pont approach to ratio analysis can be used to drill down to the true cause of financial performance problems" in a small manufacturing business.

Pratt & Hirst (2008), Palepu & Healy (2008), and Soliman (2008) and in addition, Soliman (2004): The modified Du Pont model has become widely recognized in the financial analysis literature. Because,it was found that, industry-specific DuPont multiplicative components provided more useful valuation than do economy-wide components, suggesting that industry- specific ratios have increased validity.

OBJECTIVES OF THE RESEARCH

- To analyze profitability performance of Bajaj Auto Ltd. & Hero Motocorp by using DuPont method.
- To examine the ROI and ROE of Bajaj Auto Ltd. & Hero Motocorp for last 5 years.
- To compare the ROE & ROI of Bajaj Auto Ltd. & Hero Motocorp for last 5 years.

METHODOLOGY

This study is purely based on secondary data which was collected from Annual Reports of selected firms from their respective websites. The Top 02 Indian two-wheeler companies have been selected for the study on the basis of following criteria.

Company Name	Market Capitalization	Market Shares	Sales
Bajaj Auto Ltd.	90,000 crore	18%	3,34,348 Units
Hero Motocorp	72,707.95 crore	39%	6,29,597 Units

Researcher has undertaken 05 years financial data of selected Companies i.e. 2013-2017 for the study. The researcher used statistical test i.e. „t"- test and financial ratios for data analysis. The following formula was used to discover if there is significant difference between how the performance of the company is assessed. Perhaps, being one of the most important indicators of performance, DuPont formula measures operating efficiency, asset use efficiency and financial leverage.

ROE= Profit Margin (Profit/Sales) * Total Assets Turnover (Sales/Assets) * Equity Multiplier (Assets/Equity)

ROI= Asset Turnover * Profit Margin (EBIT/Operating Income)

DATA ANALYSIS AND INTERPRETATION

Bajaj Auto Ltd.

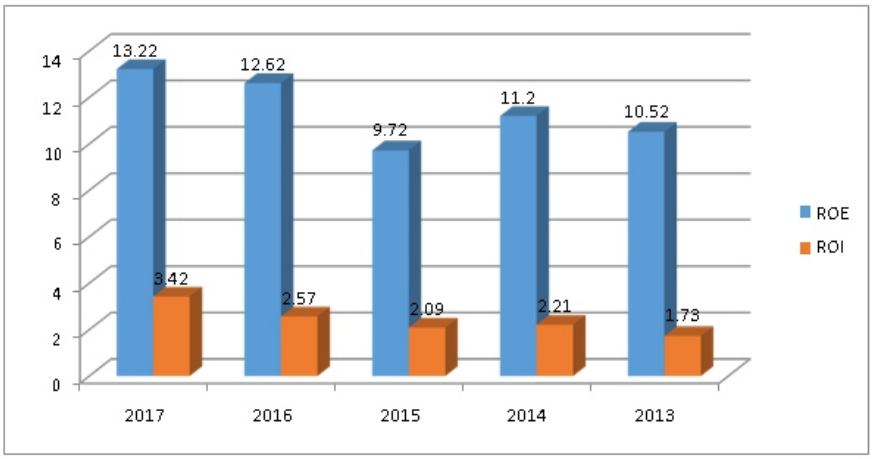

Figure 01: Bajaj Auto Ltd.- ROE & ROI

Table No. 01: Return on Equity

Year	PAT (A) Rs. In Crores	NS (B) Rs. In Crores	PM (A/B)= C %	TA (D) Rs. In Crores	TAT (B/D) = E	EQ (F) Rs. In Crores	EM (D/F)= G	ROE (C*E* G) %
2017	3827.56	21766.68	17.58	17034.13	1.28	289.37	58.87	13.23
2016	3652.41	22687.59	16.1	12401.9	1.83	289.37	42.86	12.62
2015	2813.74	21612.01	13.02	10803.92	2	289.37	37.34	9.72
2014	3243.32	20149.51	16.1	9665.76	2.08	289.37	33.4	11.21
2013	3043.57	19997.25	15.22	7973.22	2.51	289.37	27.55	10.52
Mean	3,316.12	21,242.61	15.6	11,575.79	1.94	289.37	40	11.46
t-value	17.64	41.48	20.83	7.5	9.73	-----*	7.49	17.63
p-value	0	0	0	0.002	0.001	-----*	0.002	0

* t-value cannot be calculated because of the constant value throughout the years.

From the above table it is inferred that, the profit margin averaged 15.60%, minimum value of the profit margin was 13.02 in the year 2015 and maximum was 17.58 in the year 2017. The net profit margin ratio was showing that increasing trend since 2013 and profit after tax has also increased year by year. But, in the year 2015 profit margin was (13.2%) declined due to increasing operating expenses and hence it resulted into lower operating profit. t-test (t-value 20.83 & $p<0.05$) shows there is significant increased profit margin ratio instead of decreased in the 2015.

Total Assets Turnover averaged 1.94 times, maximum was 2.51 in the year 2013 and minimum 1.28 in 2017. The table shows that the Total Asset Turnover ratio decreasing year by year. It means management of the organization is not using its assets effectively to produce the sales.

Equity Multiplier is a ratio used to analyze a company"s debt and equity financing strategy. The Equity Multiplier ratio averaged 40.00, minimum was 27.55 in the year 2013 and maximum ratio was 58.87 in the year 2017. There is significant increase shown since 2013 (t value 7.49 & $p < 0.05$). It indicates that, more assets were funded by the debt rather than equity. Therefore, ROE has increased because financial leverage also has increased in 2017 as compare to 2013.

Table No. 02- Return on Investment

	AT	**EBIT**	**OI**	**PM**	**ROI**
Year	*(A)*	*(B)*	*(C)*	*(B/C)= D*	*(A*D) %*
		Rs. in Crores	*Rs. in Crores*		
2017	2.83	5337.03	4422.35	1.21	3.42
2016	2.28	5385.66	4779.55	1.13	2.57
2015	2.11	4091.28	4116.55	0.99	2.1
2014	1.96	4632.54	4105.74	1.13	2.21
2013	1.48	4266.77	3635.25	1.17	1.74
mean	2.13	4742.66	4211.89	1.13	2.41
t value	9.71	17.74	22.21	30.35	8.43
p value	0.001	0	0	0	0.001

From the above Table, it is observed that, the ROI of the Bajaj Auto Ltd averaged 2.41%, maximum was 3.42 in 2017 and minimum was 1.74 in the year 2013. It is cleared. It is cleared that ROI has significantly increasing (t value 8.43 % & $p <0.05$) every year since 2013. It means, the investments are gaining comparably favorable to its cost.

Hero Motocorp

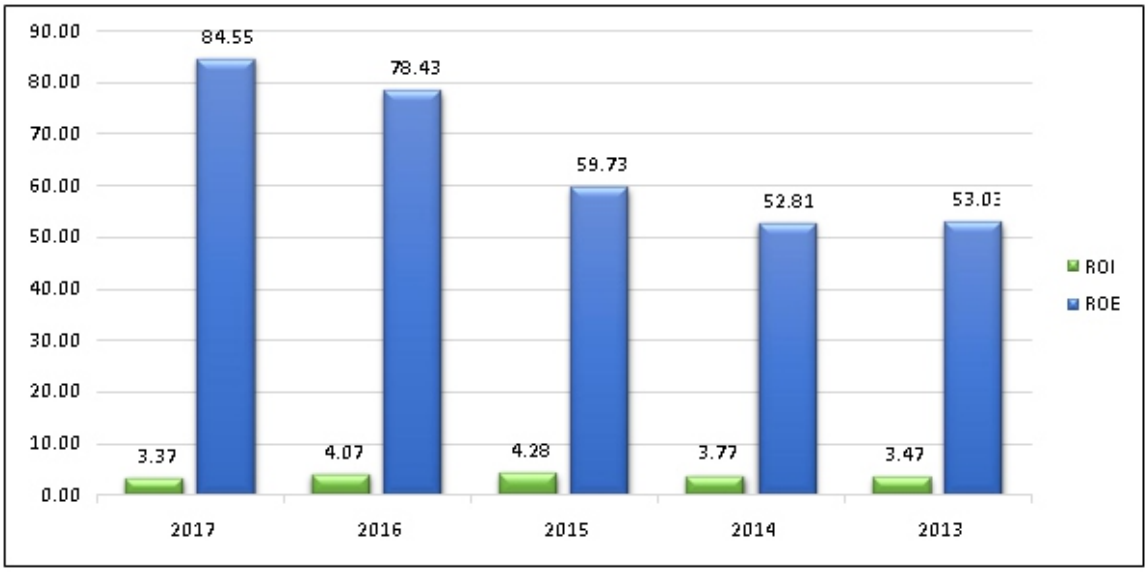

Figure No. 02: Hero Motocorp- ROE & ROI

Table No. 03 – Return On Equity

Year	PAT (A) Rs. In Crores	NS (B) Rs. In Crores	PM (A/B)= C %	TA (D) Rs. In Crores	TAT (B/D)= E	EQ (F) Rs. In Crores	EM (D/F)= G	ROE (C*E* G) %
2017	3,377.12	28,474.99	11.86	9,646.24	2.95	39.94	241.52	84.55
2016	3,132.37	28,599.30	10.95	7,339.35	3.9	39.94	183.76	78.43
2015	2,385.64	27,585.30	8.65	6,541.33	4.22	39.94	163.78	59.73
2014	2,109.08	25,275.47	8.34	5,599.87	4.51	39.94	140.21	52.81
2013	2,118.16	23,768.11	8.91	5,308.40	4.48	39.94	132.91	53.03
Mean	2,624.47	26,740.63	9.74	6,887.04	4.01	39.94	172.44	65.71
t value	9.91	28.06	13.92	8.86	13.97	****	8.86	9.91
p value	0.001	0	0	0.001	0	****	0.001	0.001

* t-value cannot be calculated because of the constant value throughout the years.

Above Table indicates that, the profit margin averaged 9.74%, the minimum was 8.34 in 2014 and maximum was 11.86 in the year 2017. Profit margine ratio has increased throughout the years t-test (t value 13.92 & $p < 0.05$) shows there is significant increased in profit margin.

Total Assets Turnover averaged 4.01 times, minimum is 2.95 in 2017 and maximum is 4.51 in 2014. It suggest that the efficiency of total assets is decreasing from 2015 (t value 13.97 & $p < 0.05$) it means management of the company not using its assets to drive the sales.

Financial Leverage of the company significantly increased (t value 8.86& $p < 0.05$), It indicates that, more assets were funded by the equity rather than debt. It means that company uses more than 100% debt to finance its assets.

Table No. 04 – Return on Investment

Year	AT (A)	EBIT (B) Rs. in Crores	OI (C) Rs. in Crores	PM (B/C)= D	ROI (A*D) %
2017	3.35	4,664.51	4,634.81	1.01	3.37
2016	4.12	4,396.73	4,447.01	0.99	4.07
2015	4.54	3,339.91	3,542.18	0.94	4.28
2014	4.63	2,879.07	3,540.06	0.81	3.77
2013	4.48	2,541.11	3,284.48	0.77	3.47
mean	4.22	3,564.27	3,889.71	0.9	3.79
t value	17.97	8.56	14.32	18.7	21.94
p value	0	0.001	0	0	0

From the above table it is observed that, the ROI of Hero Motocorp averaged 3.79, the highest in the year 2015 i.e. 4.28 & lowest in 2017 i.e. 3.37. It is clared that ROI has significantly increased (t value 21.94 & $p < 0.05$) every year since 2013. It is because of the profit margin and operating income has also significantly increased.

Comparision of Bajaj Auto Ltd and Hero Motocorp

ROE:

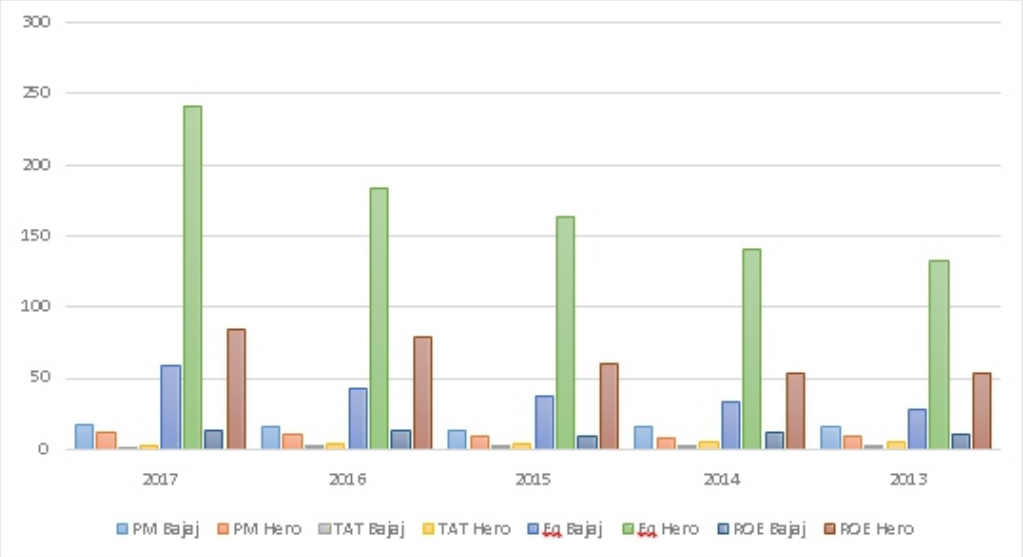

Figure No. 03: ROE

From the above figure No.03 it has been observed that, the ROE of the Hero Motocorp is much higher than the Bajaj Auto Ltd. But, Bajaj Auto is more financially leveraged than Hero Motocorp. Its better to have low multiplier ratio and Bajaj Auto having low equity multiplier and lower multiplier ratios are always considered more conservative and more fevorable than higher ratios because companies with lower ratios are less dependent on debt financing and don"t have high debt servicing cost.

ROI:

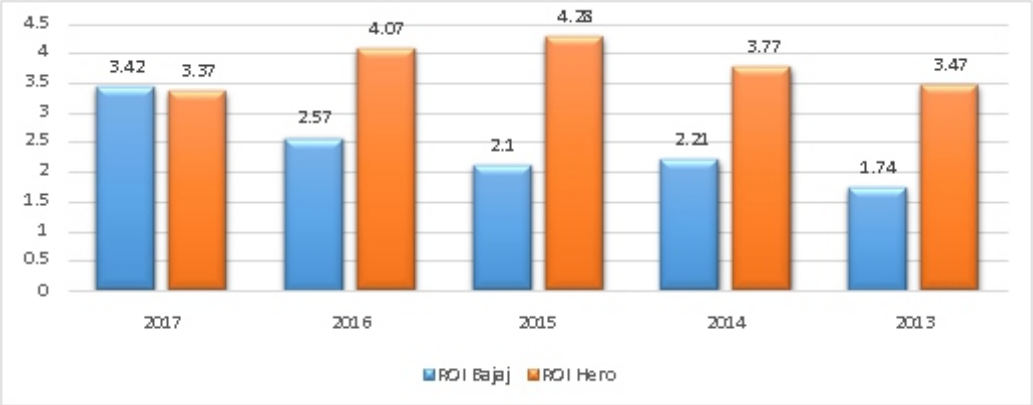

Figure No. 04- ROI

From the above figure no. 04 it has been observed that, ROI of Hero Motocorp is much higher than Bajaj auto ltd. but in the year 2017 the ROI of Hero Motocorp has declined due to low assets turnover.

FINDINGS

Bajaj Auto Ltd.

- Operating expenses of Bajaj Auto Ltd. were increased in 2015 and hence it resulted into lower operating profit in the same year.
- Total Turnover ratio of the Bajaj Auto Ltd. decreasing year by year. It indicates that, the management of Bajaj Auto Ltd. are not using its assets to produce the sales.
- More assets of the Bajaj Auto Ltd. were funded by the debt rather than equity. Therefore, ROE has increased because financial leverage also has increased in 2017 as compare to 2013.
- The investments of the Bajaj Auto Ltd. are gaining comparably favorable to its cost.

Hero Motocorp

- Profit margin of the Hero Motocorp has been significantly increased because Profit after Tax has also been increased throughout the years.
- The efficiency of total assets of Hero Motocorp is decreasing from 2015. it means management of the company not using its assets to drive the sales.
- Financial Leverage of Hero Motocorp significantly It means that company uses more than 100% debt to finance its assets.
- The ROI of Hero Motocorp has significantly increased every year since 2013. Because, the profit margin and operating income has also significantly increased.

Comparision

- The ROE of the Hero Motocorp is much higher than the Bajaj Auto Ltd. But, Bajaj Auto is more financially leveraged than Hero Motocorp.
- ROI of Hero Motocorp is much higher than Bajaj auto ltd. but in the year 2017 the ROI of Hero Motocorp has declined because, decreased in Assets Turnover.

CONCLUSION

In this research, researcher has attempted to measure ROE & ROI to find out the profitability and made comparison against its competitors by using DuPont model of the Bajaj Auto Ltd. and Hero Motocorp. At the end, it is concluded the Du Pont analysis made by calculating ROE & ROI for top two Indian Auto-mobile Companies (Bajaj Auto Ltd. And Hero Motocorp) and result portrays that Bajaj Auto Ltd. have better profitability performance rather than its competitor Hero Motocorp.

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Comparative Study of Net Interest Margin (NIM) of Selected Indian Public and Private Sector Banks

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ABSTRACT

Net Interest Margin (NIM) of commercial banks varies from economy to economy due to variation in country, industry and firms specific factors. This study aims to assess and identify the determinants of NIM in the Indian Banking Industry. The data has collected from annual reports of selected Bank for the period 2008 to 2017 and MS Excel has been used for analysis of data. In this study, assessment was made to identify determinants of NIM, which is the ratio of net interest income to earning assets using panel data. The results of the study revealed that cost efficiency, implicit interest payment, competition, and scale efficiency have positive and significant effect on NIM. However, liquidity risk and management efficiency has negative and significant effect on NIM. On the other hand, credit risk, interest rate risk, capital risk, inflation and economic growth do not seem to have significant impact on banks" performance.

Keywords: Net Interest Margin, Banking Industry, Macroeconomic Variables, Banking Performance

INTRODUCTION

Finance is an integral part of any financial system and allows businesses to take advantage of opportunities. Financial institutions are important in managing and circulating fund within the economy. In doing so, financial institutions contribute towards economic growth and efficiency of a country through optimal allocation of resources. They provide platform for continuous restructuring of the economy through reallocating financial resources to the fastest growing sectors. For financial institutions to play their expected role, a well functioning financial system is a must, as a weak financial system is one of the reasons for many countries to remain poor.

Under developing economies like India where the financial sector is largely dominated by banks, the effective and efficient functioning of the banking sector plays significant role in accelerating economic growth. In order to achieve the goal of efficient allocation of resources, the intermediation role of banks should be carried out at the lowest possible cost. However, studies conducted to assess the effect of intermediation cost (interest margin) of banks in different parts of the world show variations. The main reason behind this variation associated with both internal and external factors such as credit risk, liquidity risk, interest rate risk, cost efficiency, management quality, competition, inflation, GDP growth, etc. and change in any of these factors leads to change in interest margin and economic growth.

The NIM ratio measures the profit a company makes on its investing activities as a percentage of total investing assets. Banks and other financial institutions typically use this ratio to analyze their investment decisions and track the profitability of their lending operations. This way they can adjust their lending practices to maximize profitability.

Investment firms also use this margin to measure the success of a fund manager‟s investment decision-making. A positive percentage indicates that the fund manager made good decisions and was able to a profit on his investments. A negative ratio, on the other hand, means the fund manager lost money on his investments because the interest expenses exceeded the investment earnings.

The net interest margin formula is calculated by dividing the difference of investment income and interest expenses by the average earning assets.

Net Interest Margin = (Investment Income – Interest Expenses) / Average Earning Assets

LITERATURE REVIEW

Dr. Virender Koundal (2012) concludes that commercial banks in India get favorable effects because of the various reforms. Even though the overall profitability has also improved, the major benefit is taken by the private sector banks and foreign banks whereas public sector banks are still lagging behind on various financial parameters.

Seema Malik (2014) has analyzed the effect of technology on transformation of banking in India and also studied the benefits and challenges of changing banking trends. Technology and financial innovations have led to tremendous improvement in banking services and operations over the past decade. Survival, growth and profitability of banks depend upon the organizational effectiveness and operational efficiency in today's competitive scenario where customers „needs are changing everyday and technology is touching new highs.

Indian Brand Equity Foundation (2015) has studied that Indian banks are focusing on adopting an integrated approach to risk management. Banks have already embraced the international banking supervision accord of Basel II. According to RBI, majority of the banks already meet with the capital requirements of Basel III, which has a deadline of March 31, 2019. Most of the banks have put in place the framework for asset-liability match, credit and derivatives risk management. As per their report, rising incomes are expected to increase the need for banking services in rural areas which will

positively affect the growth of the banking sector. The RBI has relaxed its branch licensing policy which emphasized the need to focus on spreading the reach of banking Services to the un-banked population of India.

Brock et al., (2000): The cost of funding affects the investment potential and capital allocation of the banks. The increasing cost of intermediation negatively affects the growth potential of the economy. The increasing financial intermediation cost affects banks‟ profitability and thus, being a reason for decreasing efficiency of the banking sector as a whole. High interest margin is also considered „negatively‟ as it leads to „disintermediation.

Research Gap

After reviewing the available literature research gap has been observed i.e. the research on NIM did not happened after Dr.Virender Koundal (2012) research paper. It means, since last 5 years the research on NIM has not been done.

OBJECTIVES OF THE RESEARCH

1) To study the profitability of 08 Selected Indian public and private Sector banks.
2) To find out impact of NIM on ROA.

RESEARCH TYPE:

Analytical Research has used for the research. Researcher has to use facts or information already available, and analyze them to make a critical evaluation of the material. It involves the in-depth study and evaluation of available information in attempts to explain complex phenomenon.

SAMPLING METHOD:

Researcher wanted to find out characteristics of a population and the objective of the study. Hence, Purposive sampling method has used. Purposive sampling is also known as judgmental, selective, or subjective sampling.

SELECTION OF SAMPLE:

The Indian Banks were selected for the study. Researcher has undertaken top 4 public banks and private banks each for the study. While selecting the banks researcher consider their market capitalization and market shares.

SAMPLE SIZE : 08 Indian Banks (04 Public and 04 private sector Banks)

PUBLIC BANKS-	PRIVATE BANKS-
STATE BANK OF INDIA	AXIS BANK
BANK OF MAHARASHTRA	KOTAK MAHINDRA BANK
BANK OF BARODA	HDFC BANK
BANK OF INDIA	ICICI BANK

DATA COLLECTION

- Secondary Data

Instruments used for data collection-

- Annual Reports of 04 Public and 04 private sector Banks
- Websites- https://www.moneycontrol.com/

PERIOD OF STUDY:

Researcher has undertaken 10 years financial data of selected banks i.e. 2008-2017 for the study.

TOOLS USED FOR DATA ANALYSIS

A research design is a plan according to which observations are made and data is assembled. The Present study is based on the secondary data and analytical in nature.

For measuring various phenomena and analyzing the collected data effectively and efficiently to draw sound conclusions, certain statistical techniques were used. Trend analysis, graphical analysis and descriptive statistics like as Mean has been used. Also researcher used the tools like MS-Excel for analysis purpose.

FORMULA-

Net Interest Margin = (Investment Income – Interest Expenses) / Average Earning Assets

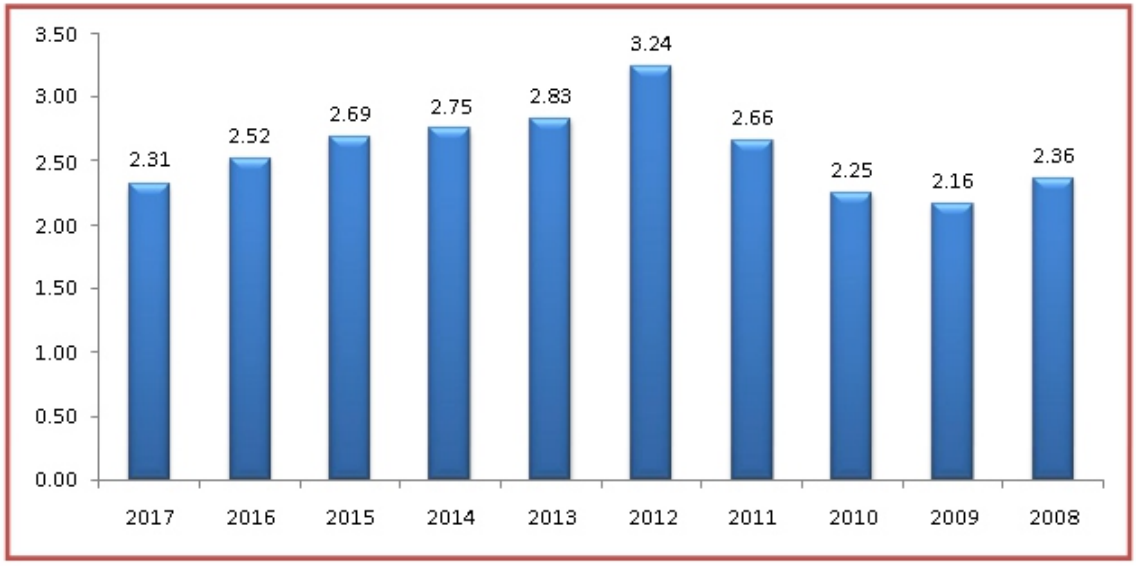
DATA ANALYSIS AND INTERPRITATION PUBLIC SECTOR BANKS- STATE BANK OF INDIA

Table No. 01- NIM of State Bank of India

Year	Interest Income	Interest Expenses	Net Interest Income	Total Assets	NIM %	ROA
2017	1,75,518.24	1,13,658.50	61,859.74	26,74,380.65	2.31	0.41
2016	1,63,685.31	1,06,803.49	56,881.82	22,59,063.05	2.52	0.46
2015	1,52,397.07	97,381.82	55,015.25	20,48,079.80	2.69	0.76
2014	1,36,350.80	87,068.63	49,282.17	17,92,234.60	2.75	0.65
2013	1,19,657.10	75,325.80	44,331.30	15,66,261.03	2.83	0.91

2012	1,06,521.45	63,230.37	43,291.08	13,35,519.24	3.24	0.88
2011	81,394.36	48,867.96	32,526.40	12,23,736.21	2.66	0.71
2010	70,993.92	47,322.48	23,671.44	10,53,413.74	2.25	0.88
2009	63,788.43	42,915.29	20,873.14	9,64,432.08	2.16	1.04
2008	48,950.31	31,929.08	17,021.23	7,21,526.32	2.36	1.01
Mean					2.58	

Graph No. 01- NIM of State Bank of India



Interpretation:

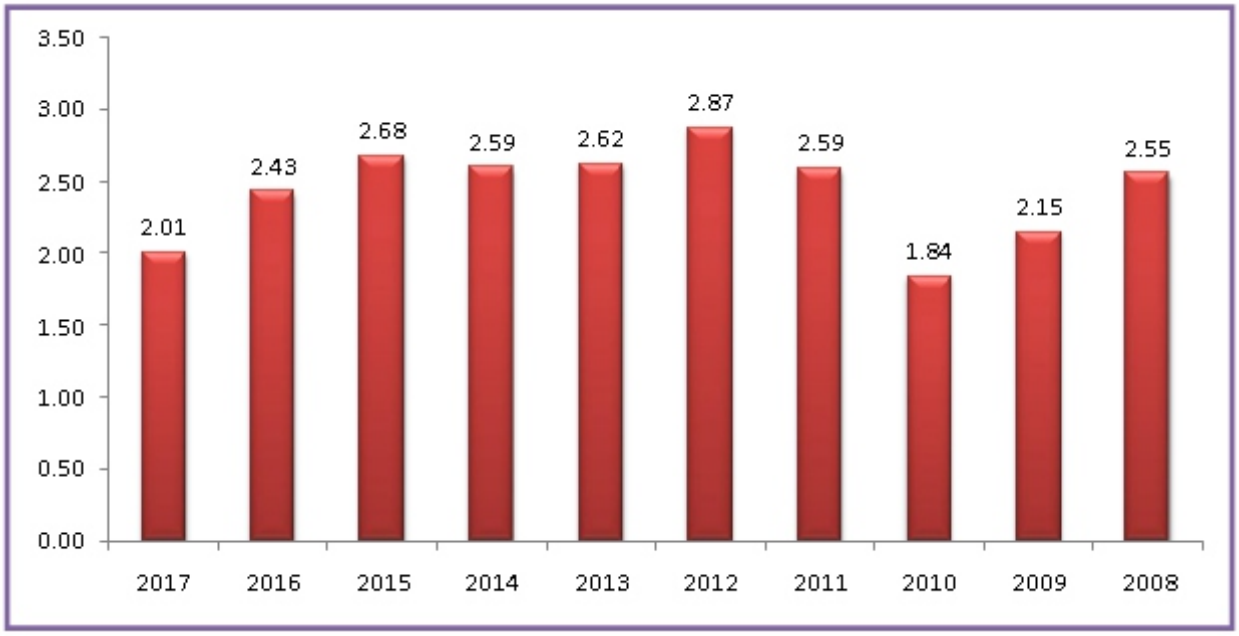
From the above Table No. 01 it has been observed that, the NIM averaged 2.58%, highest was 3.24% in the year 2012 and lowest was 2.16% in the year 2009. It has been seen that decreasing trend of the NIM since 2013 due to increasing NPA from same period and it"s also resulted on Return on Asset. The ROA in the year 2016 was 0.46% and it became 0.41% in 2017 because decreasing NPA. The low margin is partly affected by a very low return on the investment portion of the balance sheet. However, we have also seen decrease spread on loan and deposit rates over the past five years.

BANK OF MAHARASHTRA

Table No. 02- NIM: Bank of Maharashtra

Year	Interest Income	Interest Expenses	Net Interest Income	Total Assets	NIM %	ROA
2017	12,061.96	8,887.27	3,174.69	1,58,117.52	2.01	-0.86
2016	13,052.99	9,174.29	3,878.70	1,59,661.55	2.43	0.07
2015	12,665.44	8,790.40	3,875.04	1,44,640.65	2.68	0.33
2014	11,956.66	8,447.73	3,508.93	1,35,254.47	2.59	0.3
2013	9,613.43	6,580.08	3,033.35	1,15,832.53	2.62	0.74
2012	7,213.96	4,696.88	2,517.08	87,642.35	2.87	0.55
2011	5,563.09	3,594.69	1,968.40	75,998.66	2.59	0.47
2010	4,735.56	3,439.31	1,296.25	70,601.22	1.84	--
2009	4,291.56	3,035.03	1,256.53	58,578.17	2.15	--
2008	3,540.58	2,311.79	1,228.79	48,134.79	2.55	--
Mean					2.43	

Graph No. 02- NIM: Bank of Maharashtra



Interpretation:

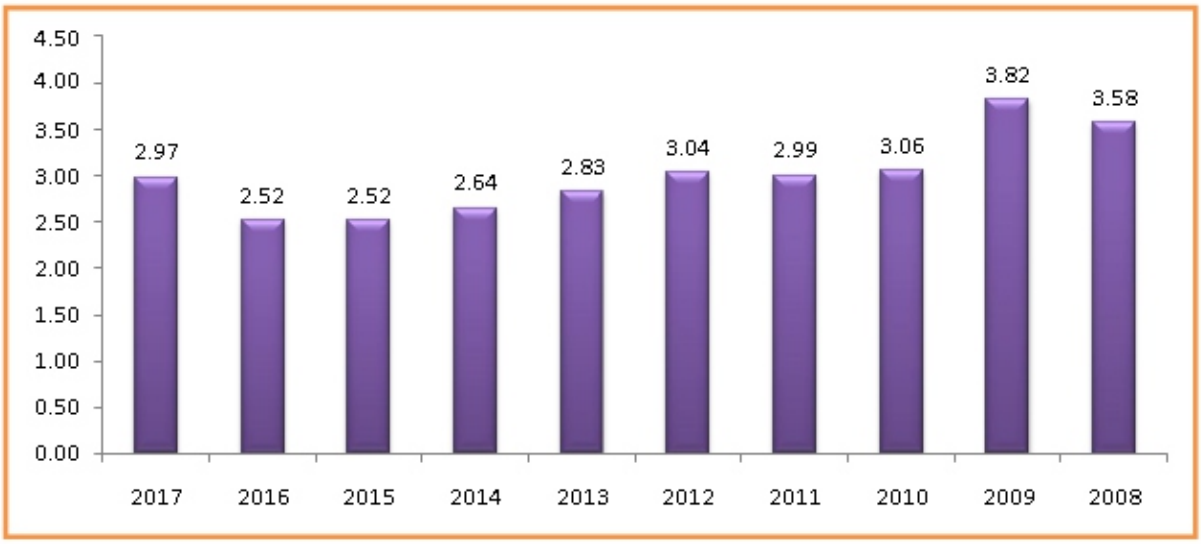
From the Table No. 02 depicts that, the averaged Net Interest Margin of the Bank of Maharashtra was 2.43%, maximum was 2.87% in the year 2012 and minimum was 1.78% in the year 2010. It has been seen that the NIM has decreasing since 2013 due to increasing NPA. The NPA of the Bank of Maharashtra in the year 2013 was 0.52% and in the year 2017 it headed 11.76. The figure roughly translates to near 10% of all loans given. This means that about 11.76% of loans are never paid back, resulting in substantial loss of money to the banks.

BANK OF INDIA

Table No. 03- NIM: Bank of India

Year	Interest Income	Interest Expenses	Net Interest Income	Total Assets	NIM %	ROA
2017	46,063.18	27,464.74	18,598.44	6,26,309.27	2.97	-0.24
2016	45,449.01	30,071.84	15,377.17	6,09,913.93	2.52	-0.94
2015	47,662.61	32,086.24	15,576.37	6,18,697.76	2.52	0.03
2014	42,201.94	27,079.57	15,122.37	5,73,190.20	2.64	0.51
2013	35,674.97	22,884.93	12,790.04	4,52,602.72	2.83	0.65
2012	31,801.84	20,167.23	11,634.61	3,83,299.57	3.04	0.72
2011	24,393.49	13,941.03	10,452.46	3,49,853.08	2.99	0.82
2010	20,494.63	12,122.04	8,372.59	2,73,537.84	3.06	--
2009	19,399.22	10,848.45	8,550.77	2,23,791.46	3.82	--
2008	14,472.15	8,125.95	6,346.20	1,77,066.90	3.58	--
Mean					3	

Graph No. 03- NIM: Bank of India



Interpretation:

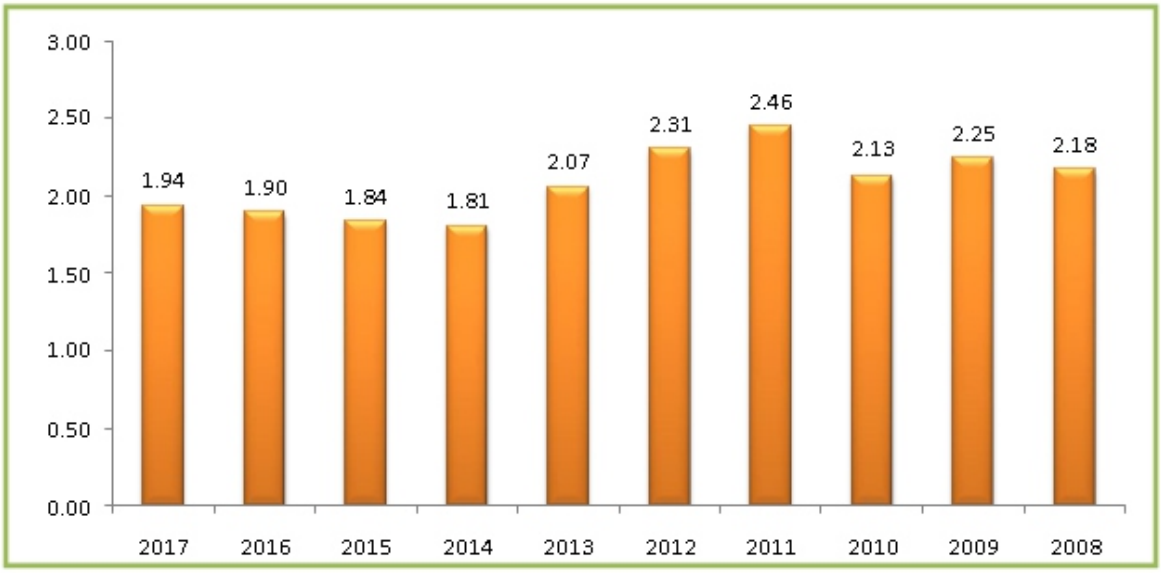
Table No. 03 showing that, the average Net Interest Margin of the Bank of India was 3.00%, highest was 3.82% in the year 2009 and lowest was 2.52% in the years 2015 & 2016. It"s has been seen that, the NIM of the Bank of India in the year 2017 has increased (2.97%). It has been observed that, the Borrowings of the Bank of India were increased 5.13% as compared to last year (2016) and NPA has also decreased from 7.79 to 6.90.

BANK OF BARODA

Table No. 04- NIM: Bank of Baroda

Year	Interest Income	Interest Expenses	Net Interest Income	Total Assets	NIM %	ROA
2017	42,199.93	28,686.52	13,513.41	6,94,875.41	1.94	0.2
2016	44,061.28	31,321.43	12,739.85	6,71,376.48	1.9	-0.78
2015	42,963.56	29,776.32	13,187.24	7,14,988.55	1.84	0.49
2014	38,939.71	26,974.36	11,965.35	6,59,504.53	1.81	0.75
2013	35,196.65	23,881.39	11,315.26	5,47,135.44	2.07	0.9
2012	29,673.72	19,356.71	10,317.01	4,47,321.46	2.31	1.24
2011	21,885.92	13,083.66	8,802.26	3,58,397.18	2.46	1.33
2010	16,698.34	10,758.86	5,939.48	2,78,316.71	2.13	--
2009	15,091.58	9,968.17	5,123.41	2,27,406.73	2.25	--
2008	11,813.48	7,901.67	3,911.81	1,79,599.50	2.18	--
Mean					2.09	

Graph No. 04- NIM: Bank of Baroda



Interpretation:

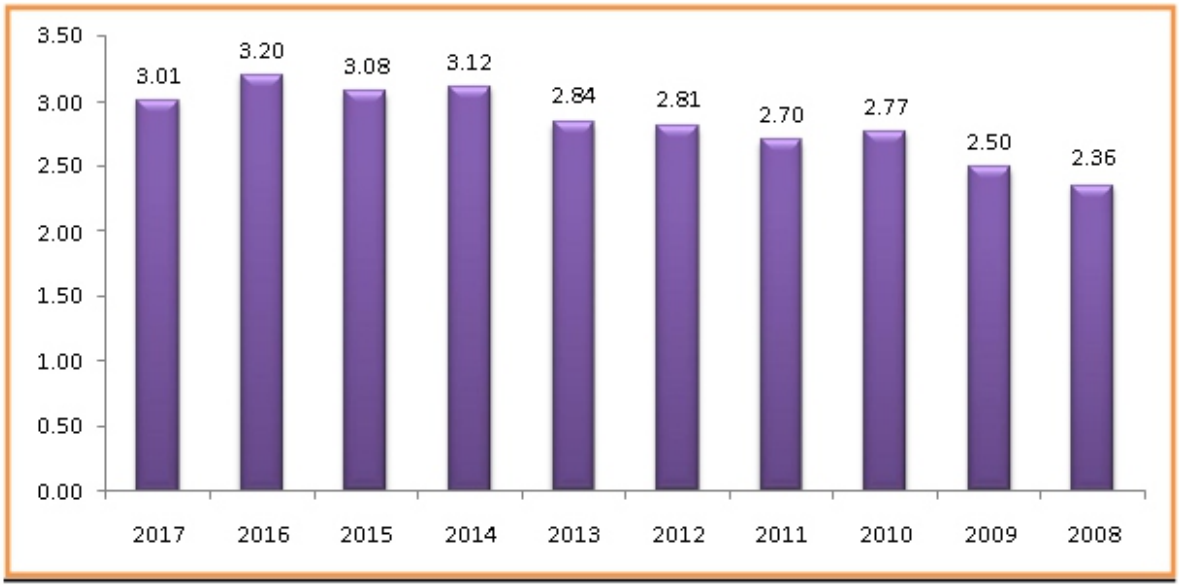
From the Table No. 04 it has been observed that, the average Net Interest Margin of the Bank of Baroda was 2.09%, higher was 2.46% in the year 2011 and lower was 1.81% in the year 2014. It can also be observed that, NIM was decreasing 2012 to 2014 but it also has increasing since 2015 to 2017. Because, NPA have been decreased from 5.06% (2016) to 4.72% in 2017. And it‟s resulted on ROA of the Bank of Baroda. ROA of the Bank of Baroda in the year 2016 was - 0.78% and it has become 0.20% in the year 2017.

PRIVATE SECTOR BANKS- AXIS BANK

Table No. 05- NIM: AXIS BANK

Year	Interest Income	Interest Expenses	Net Interest Income	Total Assets	NIM %	ROA
2017	44,542.16	26,449.04	18,093.12	6,01,467.66	3.01	0.65
2016	40,988.04	24,155.07	16,832.97	5,25,467.61	3.2	1.72
2015	35,478.60	21,254.46	14,224.14	4,61,932.39	3.08	1.83
2014	30,641.16	18,689.52	11,951.64	3,83,244.89	3.12	1.78
2013	27,182.57	17,516.31	9,666.26	3,40,560.67	2.84	1.7
2012	21,994.65	13,976.90	8,017.75	2,85,627.80	2.81	1.68
2011	15,154.81	8,591.82	6,562.99	2,42,713.37	2.7	1.68
2010	11,638.02	6,633.53	5,004.49	1,80,647.87	2.77	--
2009	10,835.49	7,149.27	3,686.22	1,47,722.06	2.5	--
2008	7,005.32	4,419.96	2,585.36	1,09,577.84	2.36	--
Mean					2.84	

Graph No. 05- NIM: AXIS BANK



Interpretation:

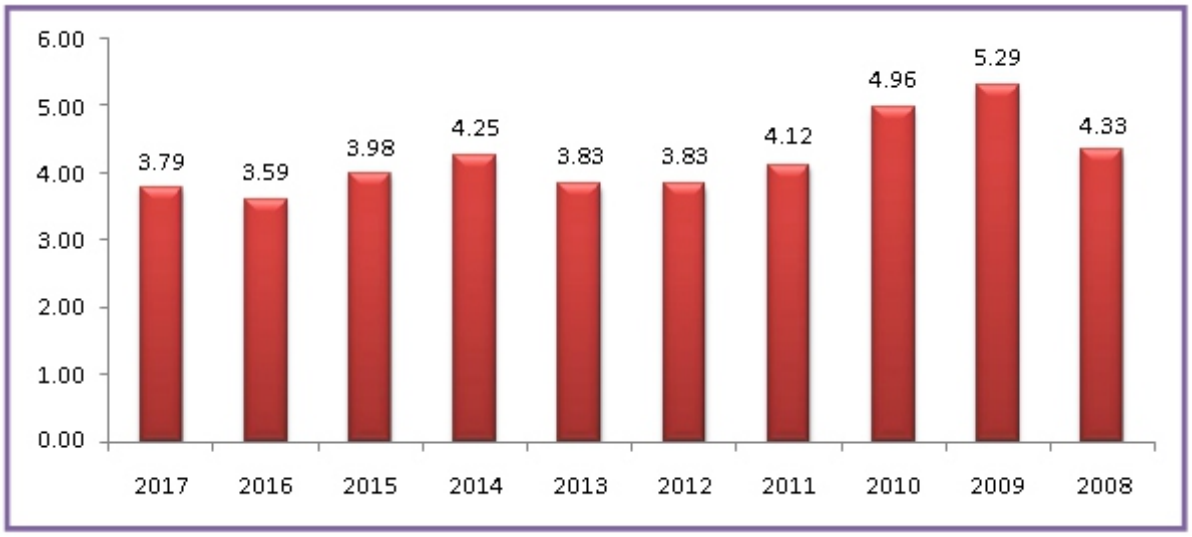
From the table No. 05 it has been seen that, the average Net Interest Margin of Axis Bank was 2.84%. Higher was 3.20% in the year 2016 and lower was 2.36% in 2008. It means the NIM of Axis bank has increased till 2016 but, in 2017 it"s declined by 3.01%, it also resulted in ROA of the bank. The ROA in the year 2016 was 1.72% and in 2017 it became 0.65%. It has been observed that, the NPA of Axis Bank has increased in 2017 (0.70 to 2.11).

KOTAK MAHINDRA BANK

Table No. 06- NIM: KOTAK MAHINDRA BANK

Year	Interest Income	Interest Expenses	Net Interest Income	Total Assets	NIM %	ROA
2017	17,698.93	9,572.78	8,126.15	2,14,589.96	3.79	1.73
2016	16,384.18	9,483.81	6,900.37	1,92,259.79	3.59	1.19
2015	9,719.87	5,496.13	4,223.74	1,06,012.08	3.98	1.98
2014	8,767.12	5,047.07	3,720.05	87,585.34	4.25	1.8
2013	8,042.49	4,836.82	3,205.67	83,693.68	3.83	1.81
2012	6,180.24	3,667.75	2,512.49	65,666.79	3.83	1.83
2011	4,189.75	2,092.18	2,097.57	50,850.67	4.12	1.77
2010	3,255.62	1,397.48	1,858.14	37,436.31	4.96	--
2009	3,065.14	1,546.60	1,518.54	28,711.88	5.29	--
2008	2,535.36	1,309.56	1,225.80	28,312.36	4.33	--
Mean					4.2	

Graph No. 06- NIM: KOTAK MAHINDRA BANK



Interpretation:

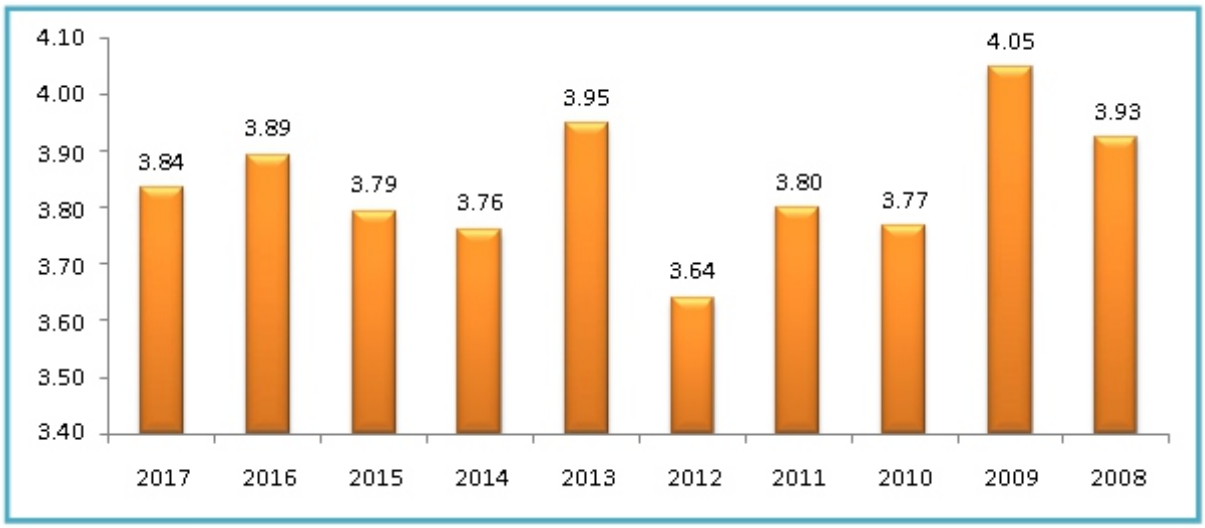
Table No. 06 shows that, the average Net Interest Margin of Kotak Mahindra Bank was 4.20%, maximum was 5.29% in the year 2009 and minimum was 3.59% in the year 2016. It has been seen that the NIM of bank has fluctuating throughout the years. NIM has increased in 2017 due to increased in Interest Income by 7.71% in the same year.

HDFC BANK

Table No. 07- NIM: HDFC BANK

Year	Interest Income	Interest Expenses	Net Interest Income	Total Assets	NIM %	ROA
2017	69,305.96	36,166.73	33,139.23	8,63,840.20	3.84	1.88
2016	60,221.45	32,629.93	27,591.52	7,08,845.57	3.89	1.92
2015	48,469.90	26,074.24	22,395.66	5,90,503.07	3.79	2
2014	41,135.53	22,652.90	18,482.63	4,91,599.50	3.76	2
2013	35,064.87	19,253.75	15,811.12	4,00,331.90	3.95	1.9
2012	27,286.35	14,989.58	12,296.77	3,37,909.49	3.64	1.8
2011	19,928.21	9,385.08	10,543.13	2,77,352.61	3.8	1.6
2010	16,172.90	7,786.30	8,386.60	2,22,458.56	3.77	--
2009	16,332.26	8,911.10	7,421.16	1,83,270.78	4.05	--
2008	10,115.00	4,887.12	5,227.88	1,33,176.60	3.93	--
Mean					3.84	

Graph No. 07- NIM: HDFC BANK



Interpretation:

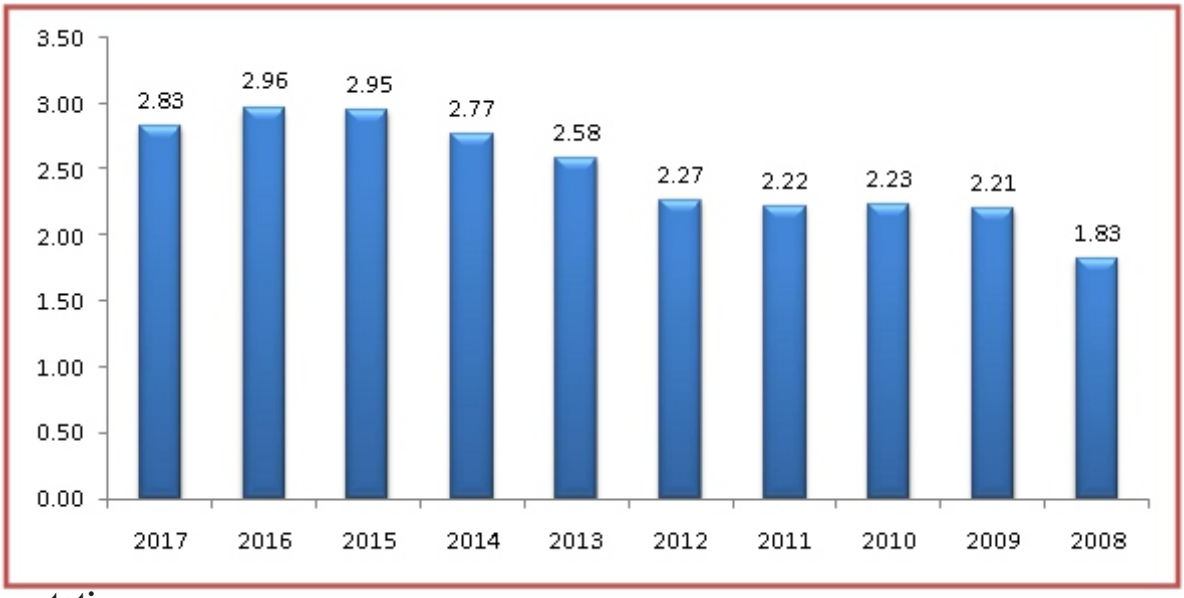
The Table No. 07 depicts that, the average NIM of HDFC Bank was 3.84%, maximum was 4.05% in the year 2009 and minimum was 3.64% in the year 2012. The low margin is affected by increasing in deposits. However, researcher has also seen decreased spread on Loan rates over the last five years.

ICICI BANK

Table No. 08- NIM: ICICI BANK

Year	Interest Income	Interest Expenses	Net Interest Income	Total Assets	NIM %	ROA
2017	54,156.28	32,418.96	21,737.32	7,68,749.32	2.83	1.1
2016	52,739.43	31,515.39	21,224.04	7,17,877.63	2.96	1.49
2015	49,091.14	30,051.53	19,039.61	6,46,129.29	2.95	1.86
2014	44,178.15	27,702.59	16,475.56	5,94,641.60	2.77	1.78
2013	40,075.60	26,209.18	13,866.42	5,36,794.69	2.58	1.7
2012	33,542.65	22,808.50	10,734.15	4,73,647.09	2.27	1.5
2011	25,974.05	16,957.15	9,016.90	4,06,233.67	2.22	1.35
2010	25,706.93	17,592.57	8,114.36	3,63,399.71	2.23	--
2009	31,092.55	22,725.93	8,366.62	3,79,300.96	2.21	--
2008	30,788.34	23,484.24	7,304.10	3,99,795.07	1.83	--
Mean					2.48	

Graph No. 08- NIM: ICICI BANK



Interpretation:

From the table No. 08 it has been seen that, the average Net Interest Margin of ICICI Bank was 2.48%. Higher was 2.96% in the year 2016 and lower was 1.83% in 2008. It has been seen that, the increasing trend of NIM of ICICI bank till 2016, in 2017 it"s declined by 2.83% due to increased in NPA. The NPA of the Bank was 2.67% in the year 2016 but, it increased in 2017 by 4.89%. It"s also resulted in ROA of the bank. The ROA in the year 2016 was 1.49% and in 2017 it became 1.10%.

FINDINGS

PUBLIC SECTOR BANKS

- ✓ The NPA of the State Bank of India has been decreasing since 2013 and it"s affected on NIM for same period. Deposits are rapidly increasing as compare to borrowings.
- ✓ Borrowings of Bank of Maharashtra are 178 times lower than deposits; hence it resulted into Lower NIM i.e. 2.01%. The NPA of the Bank in the year 2017 was 11.76%. This means that about 11.76% of loans are never paid back, resulting in substantial loss of money to the banks.
- ✓ The Net Interest Income of the Bank of India has increased in the year 2017 i.e. 2.97%. Because in this year NPA has decreased from 7.79% to 6.90% and borrowing are increased up to 5.13%.
- ✓ Bank of Baroda has increasing trend of the NIM since 2014. And the NPA of the Bank is decreasing since 2013. It means the performance of Bank of Baroda is being very well.

PRIVATE SECTOR BANKS

- ✓ The NIM of Axis bank has increased till 2016 but, in 2017 it"s declined by 3.01%, It has been observed that, the NPA of Axis Bank has increased in 2017 (0.70 to 2.11) and resulted on ROA too. The ROA of the Axis Bank was 1.72% in the year 2016 and in 2017 it became 0.65%.

- It has been seen that the Net Interest Margin of Kotak Mahindra bank is fluctuating throughout the years. NIM has increased in 2017 due to increased in Interest Income by 7.71%.
- The low margin of HDFC Bank is affected by increasing in deposits. However, researcher has also seen decreased spread on Loan rates over the last five years.
- It has been seen that, the increasing trend of NIM of ICICI bank till 2016, in 2017 it‟s declined by 2.83% due to increased in NPA. The ROA in the year 2016 was 1.49% and in 2017 it became 1.10% due to increased in NPA.

CONCLUSION

The study observed that variables such as size, NPA, cost (in) efficiency, deposit concentration and economic growth are important in determining the banks‟ behavior regarding their interest margin. In this research, researcher has attempted to measure NIM to find out profitability performance of 4 Indian public Banks i.e. State Bank of India, Bank of Maharashtra, Bank of India and Bank of Baroda. At the end, it is concluded the NIM made by calculating Interest Income and Interest Expenses for 8 Indian Public & Private sector Banks and result portrays that Private sector Banks (ICICI and Axis Bank) having better NIM rather than Bank of Maharashtra and State Bank of India.

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Assessment of Arbitrage Opportunities in Options Markets Using Put-Call Futures Parity: Evidence from India

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ABSTRACT

This paper aims at assessing the arbitrage opportunities in the Indian options market by using the best bid-ask quotes of European options premiums and futures prices in put-call parity theorem, covering the time period from July, 2015 to October, 2015.The opportunities are assessed for 61970 Put-Cheaper portfolios and 68225 Call-Cheaper portfolios. The underlying asset chosen for the current study is NSE Nifty index. The empirical results of the study show that in the absence of transaction costs, the put-call parity is violated in few cases and the frequency of arbitrage profits is higher in case of call-cheaper portfolios and the intensity of arbitrage profits is higher in case of put-cheaper portfolios. However after the incorporation of transaction costs, the arbitrage opportunities in the Indian options market are negligible and thus the results suggest that Indian options market are efficient to a great extent.

***Keywords:* Put-Call Future Parity, Market Efficiency, European Options, NSE India, S&P CNX Nifty, Bid-Ask Quotes.**

1. Introduction

Put-call parity relationship using spot price of the underlying asset and European call and put options, which was originally developed by Stoll (1969, 1973) and later on extended and modified by Merton (1973) and Gould and Galai (1974), is generally used to test the efficiency of any options market. However, if the underlying asset is not traded in the spot market and/or there are short selling restrictions in the spot market of the underlying asset, an arbitrageur may not be able to exploit arbitrage opportunities even if it exists. If the underlying asset is not traded in the spot market and/or there are short selling restrictions in the spot market of the underlying asset, one can use the futures price instead of the spot price of the underlying asset in put-call parity theorem to assess arbitrage opportunities. Generally, we observe that if in any market options are traded on some underlying asset, the futures are also traded on the same underlying asset. The main objective of this paper is to assess the existence of arbitrage opportunities in the Indian options market using futures price and European options in put-call futures paritytheorem(PCFP). The underlying asset chosen for the current study is NSE Nifty index of National Stock Exchange of India (NSE).

Put-call parity theorem using futures price of the underlying asset can be derived by using the following two portfolios. Portfolio A comprises of buying one European put option on the underlying asset with an exercise price K and time to maturity T and buying one futures (the current futures price is F_0) on the

same underlying asset with time to maturity T. Portfolio B comprises of buying one call option with an exercise price K and time to maturity T and lending [borrowing] $(K - F_0)e^{-rT}[(F_0 - K)e^{-rT}]$ in [from] risk-free market if $K>F_0[K<F_0]$ for the time period T.

Payoff of Portfolio A = Payoff of Portfolio $B = Ma(K - F_0, S_T - F_0)$

In case of no transaction costs, if the two portfolios have the same payoff, they must have the same cost to establish. Thus, the put-call parity relationship (assuming no transaction costs) using futures price of the underlying asset may be written as:

$$P = C + (K - F_0)^{-rT}$$

Whenever, there is a violation of put-call parity theorem and there are no transaction costs, one can earn risk-less arbitrage profit by buying relatively cheaper portfolio and selling relatively costlier portfolio. Thus, one will earn arbitrage profit if the absolute value of cash flow of the costlier portfolio is more than the absolute value of the cheaper portfolio at the time of constructing these portfolios. Thus, if portfolio A is relatively cheaper than portfolio B, one can earn riskless arbitrage profit by buying portfolio A and selling portfolio B.

If by using futures price, one observes that portfolio involving put and futures is cheaper than the portfolio involving call and risk-free asset, the risk-less arbitrage profit (assuming no transaction costs) will exist only if

$$P_0^A + F_0^A e^{-rT} < C_0^B + Ke^{-rT}$$

Where,

P_0^A: Put premium at time 0 at which one can buy a European put option on the underlying asset with an exercise price K and time to maturity T.

F_0^A: Futures price of the underlying asset at time 0 at which one can buy a futures on the underlying asset with time to maturity T.

C_0^B: Call premium at time 0 at which one can sell a European call option on the underlying asset with an exercise price K and time to maturity T.

r: Risk-free rate of interest with continuous compounding at which an arbitrageur can borrow from or lend in the risk-free market for the time to maturity T.

Similarly if by using futures price of the underlying asset, one observes that portfolio involving put and futures is costlier than portfolio involving call and risk-free asset, he or she can earn risk- less arbitrage profit (assuming no transaction costs) only if

$$P_0^B + F_0^B e^{-rT} > C_0^A + Ke^{-rT}$$

Where,

P_0^B: Put premium at time 0 at which one can sell a European put option on the underlying asset with an exercise price K and time to maturity T.

F_0^B: Futures price of the underlying asset at time 0 at which one can sell a futures on the underlying asset with time to maturity T.

C_0^A: Call premium at time 0 at which one can buys a European call option on the underlying asset with an exercise price K and time to maturity T.

There are many studies which have investigated the arbitrage opportunities using put-call parity theorem. Ofek, Richardson and Whitelaw (2004), Manohar (2013), Cremers and Weinbaum(2010), Envine and Rudd (1985), Finucane (1991), Blomeyer and Boyd (1995), Bharadwaj and Wiggin (2001), Ackert and Tian (2001), Kamara and Miller (1995), Klemkosky and Resnick (1979) and Lee and Nayar (1993) investigated the arbitrage opportunities using put- call parity theorem for the US market. Alpert (2009), Taylor (1990) and Brown and Easton (1992) used put- call parity relationship to assess arbitrage opportunities for the Australian market. The other studies which have used the put-call parity theorem to investigate arbitrage opportunities are Draper and Fung (2002) for the UK market, Mittnik and Rieken (2000) for the German market, Crapelle-Blancard and Chaudhury (2001) and Deville and Riva (2007) for the French market, Cassesse and Guidolin (2004) for the Italian market, Chesney, Gibson and Louberge (1995) for the Swiss market, Ackert and Tian (1998) for the Canadian market, Nissim and Tchahi (2011) for Israel market, Vipul (2008) for the Indian market, Zhang and Lai (2006), Fung and Mok(2001), Fung, Cheng and Chan (1997), Fung and Fung (1997) and Lung and Marshall (2002) for the Hong Kongmarket.

The frequency and intensity of arbitrage profits are more when the spot price of the underlying asset is used in put-call parity theorem to investigate the existence of the arbitrage opportunities in the options markets [Nissim and Tchahi (2011); Ofek, Richardson and Whitelaw (2004); Cassesse and Guidolin (2004); Crapelle-Blancard and Chaudhury (2001); Ackert and Tian (1998); Kamara and Miller (1995); Chesney, Gibson and Louberge (1995); Brown and Easton (1992); Finucane (1991); Envine and Rudd (1985)]. These violations of put-call parity theorem may be on account of assessing of arbitrage opportunities using American options, short selling restriction in the spot market of the underlying assets, usage of traded prices (instead of bid-ask quotes) to assess arbitrage opportunities in the options markets, and the portfolio comprising of put and the underlying asset being costlier than the portfolio comprising of call and risk-freeasset (which requires short position in the underlying asset but there may be short selling restrictions in the spot market of the underlying asset). Kamara and Miller (1995) assessed arbitrage opportunities for American market using European options in put-call parity theorem and reported that frequency and intensity of arbitrage profits are much smaller than using American options.

When futures price of the underlying asset is used in put-call parity theorem to assess arbitrage opportunities, the frequency and magnitude of arbitrage profits are much smaller than when the spot price of the underlying asset is used in used in put-call parity theorem. This may because there are no short selling restrictions in the futures market. Garay, Ordonej and Gonzalez (2003); Lung and Marshall (2002); Draper and Fung (2002); Fung and Mok (2001); Fung and Fung (1997); Fung, Cheng and Chan (1997); and Lee and Nayar (1993) used futures price of the underlying asset to assess arbitrage opportunities in options markets and did not report significant arbitrage opportunities in their studies. However, Vipul (2008) and Bharadwaj and Wiggins (2001) showed significant violations of put-call parity theorem for the Indian and the American markets respectively while using futures price of the underlying asset in put-call parity theorem.

The empirical results of these studies on the existence of arbitrage opportunities in the options market are mixed. The results of some of these studies show that arbitrage opportunities exist in the options markets. However, the results of many of these studies show that after taking into account the transaction costs arbitrage opportunities are negligible in the options markets.

In the context of developed countries like US there are sufficient studies which have assessed the efficiency of options market by using put-call parity theorem. However, in the context of emerging economies like India there are not sufficient studies which have investigated the efficiency of options market. Vipul (2008); Vipul (2009); Girish and Rastogi (2013) showed that there are quite frequent arbitrage opportunities in the Indian Option Market. With the existence of around 18 years of the Indian Derivative Market, we believe that investigating the market efficiency of Indian option market is very important. The other motivation to write this paper is that the existing studies showing frequent arbitrage opportunities in Indian option market are based on the traded data (high frequency) and thus have methodologicalissues.

A study (Vipul, 2008) which has been conducted to assess the arbitrage opportunities in the Indian context, using put-call parity theorem, has the problem of data structure and methodology. Vipul (2008) used high frequency traded prices to assess arbitrage opportunities in the Indian options market. However, the current study has used bid-ask quotes of futures and options to assess arbitrage opportunities in the Indian options market using Put-Call Futures Parity. These bid-ask quotes of each element of the two portfolios were prevailing at the same moment oftime. An arbitrageur should always use bid-ask quotes (rather than traded prices) to judge whether there exists arbitrage opportunities or not.The traded prices may be ex-ante bid price or ex-ante ask price. Many times, the traded prices may indicate the existence of arbitrage opportunities but actually there may not be any arbitrage

This study has an important contributions to make in the sense that this study suggests better data structure and methodology to judge the efficiency of options markets in general and of the Indian option market in particular.

This paper is further divided into three sections. Section 2 describes the data structure and methodology of the study. Section 3 describes the empirical results and section 4 deals with the concluding remarks.

2. DATA STRUCTURE AND METHODOLOGY

This section will describe about the data structure and methodology that have been used in the current study to assess the arbitrage opportunities in the Indian options market. One can exploit the existence of risk-less arbitrage opportunities only if all the elements of portfolios A and B (as described in the last section) are bought (sold) and sold (bought) at the same time. To analyze whether arbitrage opportunities existed in the past or not, one should not use the past traded prices of different elements of the portfolios but he or she should use the past bid-ask quotes of the these elements of the portfolios. The bid-ask quotes of different elements of the portfolios of the put-call parity theorem should be exactly of the same time.

If the portfolio involving put and futures (Portfolio A) is cheaper than the portfolio involving call and risk-free asset (portfolio B), the arbitrage profit before transaction costs is computed using the following expression.

$$BTC^{PC} = \underset{0}{C^B} + Ke^{-rT} - \underset{0}{P^A} - \underset{0}{F^A}e^{-rT}$$

Where,

BTC^{PC} : Arbitrage profit before transaction costs in case of put-cheaper portfolio.

If $BTC^{PC} > 0$, it means that an arbitrageur can earn risk-less arbitrage profit (in the absence of transaction costs) by buying the portfolio involving put and futures and selling the portfolio involving call and risk-free asset. However, if $BTC^{PC} \leq 0$, it means that risk-less arbitrage profit does not exist by buying portfolio A and selling portfolio B. Only those cases have been considered to assess arbitrage opportunities after the transaction costs where ever risk-less positive arbitrage profit exists $(BTC^{PC} > 0)$.

Similarly, if the portfolio involving call and risk-free asset (Portfolio B) is cheaper than the portfolio involving put and futures (portfolio A), the arbitrage profit before the transactioncosts is computed using the followingexpression.

$$BTC^{CC} = \underset{0}{P^B} + \underset{0}{F^B}e^{-rT} - \underset{0}{C^B} - Ke^{-rT}$$

Where.

BTC^{CC} : Arbitrage profit before transaction costs in case of call-cheaper portfolio.

If $BTC^{cc} > 0$, it means that an arbitrageur can earn risk-less arbitrage profit (in the absence of transaction costs) by buying the portfolio involving call and risk-free asset and selling the portfolio involving put and futures. However, if $BTC^{cc} \leq 0$, it means that risk-less arbitrage profit does not exist by buying portfolio B and selling portfolio A. Only those cases have been considered to assess arbitrage opportunities after the transaction costs where ever risk-less positive arbitrage profit exists $(BTC^{cc} > 0)$.

To exploit the arbitrage opportunities in the Indian market, an arbitrageur is required to incur the transaction costs on buying and/or selling the different elements of the portfolios of put-call parity theorem. An investor who trades in futures and options segment of the Indian stock exchanges is required to incur the transaction costs. The transaction costs details of different element of portfolio are given below.

Put-Cheaper:

- Average brokerage of 0.05% of the purchase price of futures at the time of constructing the portfolio.
- Average brokerage of Rs. 1.60 for every put option purchased.
- Average brokerage of Rs. 1.60 for every call option written.
- Average brokerage of 0.05% of the settlement futures price at the time of settle ment of futures contract.
- Service tax @14% on the total value of brokerage.
- Security transaction tax @0.01% of the settlement futures price at the time of settlement of the futures contract.
- Security transaction tax @0.017% of call premium and 0.125% of settlement value of put option where put option is exercised.
- SEBI turnover charges @0.0002% of the sum of purchase price of futures and settlement price of futures.
- SEBI turnover charges @0.0002% of the sum of call premium, put premium and twice the exercise price.
- Transaction charges @0.0018% of the sum of purchase price of futures and the settlement price of futures plus service tax over and above the transaction charges.
- Transaction charges @0.05% of the sum of call premium, put premium and twice the exercise price plus service tax over and above the transaction charges.
- Applicable state wise stamp duty on the sum of purchase price of futures and the settlement price of futures.

- Applicable stamp duty on the sum of call premium, put premium and twice the sum of exercise premium.

Call-Cheaper:

- Average brokerage of 0.05% of the sale price of futures at the time of constructing the portfolio.
- Average brokerage of Rs. 1.60 for every put option written.
- Average brokerage of Rs. 1.60 for every call option purchased.
- Average brokerage of 0.05% of the settlement futures price at the time of settlement of futures contract.
- Service tax @14% on the total value of brokerage.
- Security transaction tax @0.01% of the sale price of futures at the time of constructing the portfolio.
- Security transaction tax @0.017% of put premium and 0.125% of settlement value of call option where call option is exercised.
- SEBI turnover charges @0.0002% of the sum of sale price of futures and settlement price of futures.
- SEBI turnover charges @0.0002% of the sum of call premium, put premium and twice the exercise price.
- Transaction charges @0.0018% of the sum of sale price of futures and the settlement price of futures plus service tax over and above the transaction charges.
- Transaction charges @0.05% of the sum of call premium, put premium and twice the exercise price plus service tax over and above the transaction charges.
- Applicable state wise stamp duty on the sum of sale price of futures and the settlement price of futures.
- Applicable stamp duty on the sum of call premium, put premium and twice the sum of exercise premium.

The arbitrage profit after the transaction costs has been computed using the following two expressions.

$$ATC^{PC} = BTC^{PC} - TC^{PC},\ BTC^{PC} > 0$$

$$ATC^{CC} = BTC^{CC} - TC^{CC},\ BTC^{CC} > 0$$

Where,

ATC^{PC} is the arbitrage profit after transaction costs in case of the put-cheaperportfolio.

ATC^{CC} is the arbitrage profit after transaction costs in case of the call-cheaper portfolio.

TC^{PC} is the transaction costs incurred in case of the put-cheaper portfolio.

TC^{CC} is the transaction costs incurred in case of the call-cheaperportfolio.

The risk-less positive arbitrage profit after the transaction costs exists if $ATC^{PC} > 0$ case of put- cheaper portfolio and if $ATC^{CC} > 0$ n case of call-cheaper portfolio.

In addition to above, an arbitrageur also incurs the cost in terms of interest foregone on the margin deposit. The current margin deposit in case of Nifty futures is around 8% of the value of the futures contract and the margin deposit in case of Nifty options is equal to margin deposit applicable for Nifty futures plus the extent of amount to which the option is out of money.

Arbitrage profit after transaction costs and interest foregone on margin deposit has been computed using the following two expressions.

$$ATCM^{P} = ATC^{PC} - M^{PC}, ATC^{PC} > 0$$

$$ATCM^{C} = ATC^{CC} - M^{CC}, ATC^{CC} > 0$$

Where,

$ATCM^{PC}$ is the arbitrage profit after transaction costs and interest foregone on margin deposit in case of the put-cheaperportfolio.

$ATCM^{CC}$ is the arbitrage profit after transaction costs and interest foregone on margin deposit in case of the call-cheaperportfolio.

M^{PC} is the interest foregone on margin deposit in case of the put-cheaperportfolio.

M^{CC} is the interest foregone on margin deposit in case of the call-cheaperportfolio.

The risk-less positive arbitrage profit after the transaction costs and interest foregone on margin deposit exists if $ATCM^{PC} > 0$ in case of put-cheaper portfolio and if $ATCM^{CC} > 0$ se of call- cheaper portfolio.

The basic data for the current study has been taken from National Stock Exchange of India covering the time period from July 2015 to October 2015. The underlying asset for the current study is NSE Nifty index. The options on NSE Nifty index are of European style. NSE provides the data on bid-ask quotes on NSE Nifty index at five different points of time on each day, that is, 11 AM, 12 Noon, 1 PM, 2PM and 3 PM. NSE prepares the order book in which the trader can enter the order indicating underlying asset, maximum price (for buy order) or minimum price (for sell order), quantity, exercise price, expiration date, buy or sell, type of order (day order, good till cancelled order, good till day/date order, fill/kill order etc.). The snapshot directory of Futures and Options segment captures the order placed by different traders along with above details. For the current study, the best buy price and the best sell price have been used to assess the arbitrage opportunities in NSE Nifty options. Since NSE Nifty index is not traded in thespot market, the best buy futures price and the best sell futures price of the NSE Nifty index have been used to judge the efficiency of the Indian options market while using put-call parity theorem.

The best buy price at each point of time has been computed by taking the maximum of all the buy prices available in the snapshot directory of F&O segment at that moment of time. Similarly, the best sell price at each point of time has been computed by taking the minimum of all the sell prices available in the snapshot directory of F&O segment at that moment of time. The 91-days treasury bills rate has been taken as a proxy for the risk-free rate for the current study. The data on average Treasury bill rates from July 2015 to October 2015 has been taken from the official website of Reserve Bank of India.

On an average at each point of time on each day, 6407 buy orders on futures with different expiration dates, 5249 sell orders on futures with different expiration date, 13166 buy orders on options (call and put together) with different exercise prices and expiration dates and 13307 sell orders on options (call and put together) with different exercise prices and expiration dates were existing (see Table 1). Out of the total 6407 buy orders on futures 5990 (93%), 309 (5%) and 108 (2%) orders were available for near the month, not so near the month and far the month respectively. Out of the total 5249 sell orders on futures, 4994 (95%), 172 (3%) and 83 (2%) sell orders were existing for near the month, not so near the month and far the month respectively.

Out of the total 13,166 buy orders on options with different exercise prices and expiration dates, 10707 (81%), 1269 (10%) and 1190 (9%) buy orders were available for near the month, not so near the month and far the month respectively. Out of the total 13,307 sell orders on options with different exercise prices and expiration dates, 11,379 (85%), 1153 (9%) and 775 (6%) sell orders were available for near the month, not so near the month and far the month respectively.At any point of time on any day, maximum number of buy order which were available with any exercise price for near the month, not so near the month and far the month options contracts were 1305, 87 and 86 respectively. At any point of time on any day, maximum number of sell orders which were available with any exercise price for near the month, not so near the month and far the month options contracts were 1760, 91 and 69 respectively. At any expiration date and any point of time on any day, average number of exercise prices for which at least one of the four quotes (put bid, call bid, put ask, call ask) were available were 81.

Table 1: Average Number of Orders Available at Each Point of Time on Each Day

Contract	Futures		Options	
	Buy	Sell	Buy	Sell
Near the Month	5990	4994	10707	11379
Next Month	309	172	1269	1153
Far the Month	108	83	1190	775
Total	6407	5249	13166	13307

The total number of cases for which the best buy and the best sell quotes for at least one of the elements of the portfolios of put-call parity were available with different exercise price and expiration date is 98,224 (see Table 2).

Table 2: Number of Cases for Which the Best Buy and/or the Best Sell Quotes of Atleast One Element of the Portfolio was Available

Put-Cheaper	Call-Cheaper
98,224	98,224

Out of these the best buy and the best sell quotes (shown in Table 2), the total number of cases for which the quotes of all the elements of the portfolios (with different exercise prices and expiration dates) of put-cheaper and call-cheaper portfolios which were available for the period from July 2015 to October 2015 is 61,970 and 68,225 respectively (see Table 3). Thus, the opportunities are assessed for these numbers of cases for different portfolios which seem to be adequate.

Table 3: Number of Cases for Which the Best Buy and/or the Best Sell Quote of All the Elements of the Portfolio were Available

Put-Cheaper	Call-Cheaper
61,970	68,225

3. EMPIRICAL RESULTS

Out of the total number of cases for which it was possible to assess arbitrage opportunities (as shown in Table 4), the total number of cases which show positive arbitrage profits (without transaction costs) for put cheaper and call-cheaper portfolios of put-call parity theorem is 7336 and 9800 respectively. When we incorporate transaction costs (except interest foregone on margin requirements), the total number of cases which show arbitrage profits for put-cheaper, and call-cheaper is 138 and23 respectively. If we include the interest foregone on margin requirement also as part of transaction costs, we observe the arbitrage profit does not exist even in single case.

Table 4: Positive Arbitrage Profit (Number of Cases)

Put-Cheaper			Call Cheaper		
BTC	ATC	ATCM	BTC	ATC	ATCM
7336	138	0	9800	23	0

BTC: Arbitrage Profit before transaction costs; ATC: Arbitrage Profit after transaction costs but before interest foregone on margin deposit; ATCM: Arbitrage Profit after transaction costs and interest foregone on margin deposit.

Table 5 shows the analysis of arbitrage profits according to time to maturity of the options. When we analyze arbitrage profits (before transaction costs) according to time to maturity of the options contracts, we observe that for both put-cheaper and call-cheaper portfolio, the frequency of arbitrage profits is the highest in case of near the month contracts and the lowest in case of far the month contracts. The intensity of arbitrage profits is the highest in case of far the month contract for both the portfolios (put-cheaper and call cheaper) of put-call parity relationship.

Table 5: Descriptive Statistics (Time to Maturity)

Portfolio	Time to Maturity	Mean		Standard Deviation		Maximum		Minimum		Count	
		BTC	ATC	BTC	ATC	BTC	ATC	BTC	ATC	BTC	ATC
Put-Cheaper	0-30 Days	5.33	1.91	3.17	1.55	19.94	6.3	0.003	0.01	5099	64
	31-60 Days	5.13	2.02	3.65	2.7	26.96	12.29	0.001	0.07	1889	26
	>60 Days	7.09	5.32	6.46	4.53	37.25	22.26	0.04	0.2	348	48
	Overall	5.36	3.12	3.54	3.48	37.25	22.26	0.01	0.01	7336	138
Call-Cheaper	0-30 Days	3.86	1.19	2.4	0.6	15.98	1.98	0	0.62	6131	4
	31-60 Days	4	1.4	2.69	1.55	17.87	4.01	0.001	0.22	2670	7
	>60 Days	4.38	4.5	3.35	3.54	27.52	12.22	0.01	0.31	999	12
	Overall	3.95	2.98	2.59	3.1	27.52	12.22	0	0.22	9800	23

Table 6 shows the analysis of arbitrage profits according to moneyness of the options. The analysis of arbitrage profits according to the moneyness of the options show that the frequency of arbitrage profits is the highest in case of in-the-money put options for put-cheaper portfolio. For call-cheaper portfolios, the frequency of arbitrage profits is the highest in case of in-the- money call options. The intensity of arbitrage profits is the highest in case deeply in-the-money put options for put-cheaper portfolios and deeply in-the-money call options in case of call cheaper portfolios.

Table 6: Descriptive Statistics (Moneyness)

Month	Moneyness	Mean		Standard Deviation		Maximum		Minimum		Count	
	F/K	BTC	ATC	BTC	ATC	BTC	ATC	BTC	ATC	BTC	ATC
	<0.85	6.83	3.9	4.74	3.97	37.27	22.26	0.02	0.1	1186	88
Put-Cheaper	0.85-0.95	6.16	1.76	3.09	1.72	21.45	7.47	0.01	0.01	4003	47
	0.95-1.05	3.06	0.94	2.21	0.22	15.07	1.09	0.003	0.77	2136	2
	1.05-1.15	2.06	-	2.27	-	6.41	-	0.03	-	8	0
	>1.15	5.76	2.05	9.04	-	16.18	2.05	0.12	2.05	3	1
	Overall	5.36	3.12	3.54	3.48	37.25	22.26	0.01	0.01	7336	138
Call-Cheaper	<0.85	-	-	-	-	-	-	-	-	0	0
	0.85-0.95	1.25	-	0.86	-	2.87	-	0.08	-	16	0
	0.95-1.05	2.91	2.01	1.98	1.97	16.67	3.4	0	0.62	3728	2
	1.05-1.15	4.37	0.97	2.45	0.97	16.31	3.17	0.01	0.28	3670	8
	>1.15	4.95	4.37	3.04	3.44	27.52	12.22	0	0.22	2386	13
	Overall	3.95	2.98	2.59	3.1	27.52	12.22	0	0.22	9800	23

Our results are not consistent with Vipul (2008). Vipul (2008) show that there are huge arbitrage opportunities even after taking into account the transaction costs. The main reason for this inconsistency is that Vipul (2008) had used traded prices (high frequency) to assess arbitrage opportunities where as the current study used bid-ask quotes to judge the efficiency of the Indian options market. We believe that the using traded prices to assess arbitrage opportunities is not the right approach as the traded prices may be ex-ante bid price or ex-ante ask price. More specifically, if in the put-call parity relationship the portfolio involving put and futures is cheaper than the portfolio involving call and risk-free asset, then to assess arbitrage opportunities one should use the best sell price of put, the best sell price of futures, and the best buy price of call, however if one uses traded price of price of put (which was not ex-ante best sell price quote but it was ex-ante best price quote), it may show arbitrage profit using the best buy price but under this situation, an arbitrageur may actually incur losses as he or she is not buying the put option but selling the put option.

4. CONCLUSION:

The main objective of this study is to assess the arbitrage opportunities in the Indian options market by using European options and futures prices in put-call parity theorem. The current study also describes the data structure and methodology that should be used to assess the efficiency of the options markets. The study suggest that to assess the arbitrage opportunities in the options market, one should use the bid-ask quotes instead of traded prices.

The existence of arbitrage opportunities has been empirically tested for the Indian options market using the best buy price and the best sell price, covering the time period of from July, 2015 to October, 2015. The underlying asset chosen for the current study is NSE Nifty index. The empirical results show that call-cheaper portfolio generates arbitrage profit (before transaction cost) in more number of cases than put-cheaper portfolio. The magnitude of arbitrage profit (before transaction costs) is also higher in case of put-cheaper portfolio than in case of call- cheaper portfolio. When we incorporate transactions costs (before interest foregone on margin amount), the results show that arbitrage opportunities arbitrage opportunities exists in a few cases. In the presence of transaction costs (before interest foregone on margin deposits), the frequency and intensity of arbitrage profits are higher in cases of put-cheaper portfolios than in cases of call cheaper portfolios. Finally, when we incorporate interest foregone on margin amount as also part of transaction costs, we observe that arbitrage opportunities do not exist even in a single case. This shows that Indian options market is efficient. Our results are not consistent with the earlier studies in the Indian context. The main reason for this inconsistency is that the earlier studies had used traded prices instead of bid-ask quotes to assess the arbitrage opportunities which we believe is not the right approach.

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