

Financial Institutions and Services**Remuneration in European Commercial Banks**József Tóth¹

Abstract: According to the new rules to be applied in the European Union, data on compensation of material risk takers are to be disclosed from year 2014. This paper overviews the different expectations regarding remuneration of bank managers highlighting the requirements of European Parliament and Council. Furthermore, it analyses data of 18 European banks disclosed based on the new lawful requirements. Based on empirical study it proves there is correlation between number of material risk takers and value of total assets. However this correlation is not too strong.

Keywords: remuneration; compensation; bank

JEL Classification: G20; G21; G28; J33

1. Introduction

Processes, practices, activities causing global financial crisis started in 2007 are various, but there is general agreement in the financial industry, the public sector, and academia that incentive structures of the top management of the significant financial institutions did not play risk mitigation role. It is underpinned by numerous researchers. For example *Behr et al.* analysed such bonus system concerning remuneration of risk takers where the compensation structure rewards loan volume and penalizes poor performance. They argue when performance of the portfolio managed by them deteriorates, the risk takers approve a higher fraction of loan applications. In that case loan officers neglect activities that are not directly rewarded under the contract, but are in the interest of the bank. While the reaction given by loan officers constitutes a rational response to a time allocation problem, it is not in line with the bank interest. The neglected other activities are various: performing process built-in control, proper and traceable documentation of the deals, record keeping, activities concerning collaterals etc. Though, these activities are not honoured by the remuneration system, they are important in the crediting process and could cause difficulties in the future.

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Certain bank leaders motivated by promise of fabulous variable remuneration have taken excessive risks that afterwards caused significant loss during the crisis. This process was unfavourable for both the shareholders and financial system of sovereigns (and finally for the taxpayers). The needs to reform the implemented practice was strengthened by the pressure of the public when 9 banks in U.S. paid bonuses for year 2008 after receiving bail-out fund or when it was disclosed that the French investment bank Natixis, which made significant trading loss in the former year and got state support, was going to pay bonuses in amount of EUR 70 million to 3,000 employees.

2. Rules Regulating the Remuneration of the Material Risk Takers of European Banks

2.1 Principles of Financial Stability Forum

In order to promote stability of the international financial system, G7 Ministers and Governors endorsed the creation of the Financial Stability Forum (hereinafter FSF) in 1999. After a decade, motivated by the above introduced processes, the FSF issued its Principles for Sound Compensational Practice. When implementing the Principles, banks have to establish effective governance of compensation system that continuously monitors and revises the applied compensation structure. The next step is alignment of the compensation practice with prudent risk takings. In other words, level of remuneration of bank managers should depend on level of risks taken by them. According to the Principles of FSF, the implemented remuneration system must be monitored by the responsible supervisory organization and the oversight of the remuneration system must be rigorous. Furthermore, banks must disclose their compensation practice.

2.2 Implementation Standard of Financial Stability Board

The successor of the Financial Stability Forum, the Financial Stability Board (hereinafter FSB) issued the Implementation Standards of the FSF Principles. Based on the Standards, banks bearing significant system risk have to establish remuneration committees as integral part of the governance system. The remuneration committee of a bank should be able to independently evaluate the implemented compensation system. The committee should ensure that the remuneration system of the bank is in compliance with the FSF Principles and with the related Standard of Basel Committee on Banking Supervision (hereinafter Basel Committee). Ayadi and Boujelbene examined the connection between the implemented remuneration systems and the insolvency risk of the banks. They applied panel data analysis using remuneration data of thirty European banks over

the period of 2004-2009 and found negative correlation between the frequency of meeting of the remuneration committees and the risk of insolvency of the banks: when the frequency of the meetings grew, the risk of insolvency decreased in case of banks analysed. The result of this panel data analysis underpins that creation of remuneration bodies as integral part of the banking government system has significant effect on the banking risks.

In line with the Principles of FSB, the function of the remuneration committees could be fulfilled by other organizational units: the main elements of the remuneration system must be defined, monitored and revised by the remuneration committee or its equivalent.

In case of material risk takers (hereinafter MRTs) having significant effect on the risk exposure of the bank, the following principles must be fulfilled:

- Certain part of the remuneration must be variable and must be dependent variable of risks taken by the bank. There is no predefined ration;
- 40-60 percent of the variable compensation is subject to deferral period. The length of the period is not determined but cannot be less than 3 years. Nevertheless, the study of Leisen shows that such common opinion that deferring the bonus payments to the future makes the bank leaders less willing to take risks is false;
- The deferral part should depend on the level of seniority. The lower level of seniority, the lower level of deferred part;
- More than 50 percent of the variable remuneration must be paid in shares, in share equivalent or other non-cash instruments. However, the deferred part of share based compensation is not defined;
- If the financial performance of the bank ruins during the deferral period, the unvested part of the remuneration must be retained;
- If a sovereign must intervene so as to stabilize or bail-out the bank, the supervisory authority should have right to restructure the compensation system. Nevertheless, by implementing the Directive on Resolution Mechanism such situation may not occur, since the standard prohibits the direct intervention of sovereigns;
- Guaranteed bonus is not acceptable.

The Implementation Standard requires to disclose the decision making process defined in the remuneration policy, the composition of the remuneration committee (or equivalent), the main elements of the remuneration system highlighting the criteria applied in the performance evaluation, the connection between the remuneration and performance, the deferral rules, vesting and malus as well as claw-back criteria, the applied payment types as well as the aggregated awarded compensation.

2.3 Compensation Principles and Standards Assessment Methodology of Basel Committee on Banking Supervision

The Compensation Principles and Standards aims to give guideline to supervisors when examining banks' compensation system and supports assessment of the banks' compliance with the abovementioned FSF and FSB Principles and Standards. This methodology fosters supervisory approaches in promoting the evolvement of prudent compensation practices at banks.

When the supervisors evaluate the remuneration system of a bank, the following aspects must be taken into account:

1. The control over the design of remuneration system must be actively overseen by the top management. The managerial monitoring and review of the compensation system is expected so as to ensure the system operates as intended. Compensation outcomes, the related risk evaluations as well as risk outcomes should be regularly monitored. Furthermore, the remuneration system should include control mechanism;
2. The remuneration of employees in risk control area should be independent of the performance of the professional areas they monitor. This independency must be ensured. Moreover, compensation of employees in risk area should be commensurate with their key roles;
3. When determining the remuneration of the employees all types of risk should be taken into account. Therefore, both quantitative and qualitative measures should play a role in evaluation of supervisors. 4. Also, the result of the bank should be taken into account during the calculation of remuneration of banking managers. Furthermore, the remuneration of the employees should depend on the risk outcome of the bank;
6. The risks taken must determine the compensation of the employees. In order to ensure the fulfilment of this principle, certain part of the remuneration should be deferred;
7. The bank should employ different compensation forms, such as cash, shares and shares equivalents.
8. The Basel Committee expects that supervisory review of the compensation system should be rigorous;
9. Also, information on remuneration system and practice must be disclosed.

2.4 Remuneration data of material risk takers to be disclosed based on Pillar 3 requirement

The goal of these additional Pillar 3 requirements for remuneration is to support an effective market, to make possible for users the assessment of the banks' compensation practices based on information disclosed. Also, the application of these requirements contributes to promote the convergence and consistency of disclosure on remuneration. Practically, the Basel Committee requires that banks bearing significant system risk disclose information on their remuneration design and practice in line with FSF Principals and FSB Implementation Standards. Data must be related to such employees that have significant effect on risk taking, in other word to material risk takers. The rules had to be fulfilled from 2012. The following data are to be disclosed:

- The composition and mandate of the main body responsible for overview the remuneration, as well as the external consultants whose advice has been taken into account;
- The scope of the remuneration (e.g. type of material risk takers, regions, business lines etc.);
- Information related to the design and structure of compensation system including the main elements and purposes of the remuneration policy;
- Methods applied by which risks identified in the remuneration system;
- Information relating to methods by which the bank makes connection between level of performance and level of remuneration;
- Methods by which the bank adjusts remuneration based on longer-term performance;
- Different forms of variable remuneration (e.g. cash based, share based remuneration);
- Number of meetings held by remuneration committee and the compensation provided for the committee members;
- Number of employees who received compensation during the financial year (number of material risk takers);
- Amount of the compensation awarded during the financial year;
- Data on deferred remuneration.

2.5 Recommendations of European Commission

In 2009, the European Commission issued its own expectations concerning principles to be used when implementing the remuneration systems at financial institutions. According to the Recommendations:

- Financial institutions should compile remuneration policies. The policy should be in compliance with the strategy, goals and risk management of the institution, that is, the compensation system should serve the long term interest of the bank. The remuneration policy should be revised annually;
- Taking the long term interest of the bank into account, the remuneration system could not incite to excessive risk taking;
- The compensation system should make balance between the fixed and variable compensation but the variable part should be limited;
- In order to incite managers for long term sound banking activity, the variable part of their compensation should depend on long term performance of the bank. Also, the variable part of the compensation should be retained and should be subject to deferral pay period;
- The variable compensation should be paid in shares, options, cash or other financial instruments;
- The institutions are expected to create remuneration committees. As it is defined in the FSB's Principles, the members of remuneration committee should have proper profession knowledge and experience;
- The supervisory board as well as the management board should approve the compensation mechanism that determines the remuneration of senior managers. In the same time, the remuneration system should define proactive rules so as to avoid conflict of interest;
- The essence of the remuneration system should be disclosed. In the frame of the disclosure criteria used in performance assessment, types of remuneration and vesting conditions should be specified.

2.6 Capital Requirement Regulation and the related Directive (CRR/CRDIV)

The European Parliament and Council issued their regulation on prudential requirements of banks and directive on access to the activity of credit institutions and the prudential supervision of banks. The fulfilment of the expectations of the regulation is compulsory for each European bank and the rules defined by the directive cannot be significantly modified by the member states. In other approach, while the FSF Principles, the FSB Standards, Principles and Standards of Basel

Committee as well as Recommendations of European Commission are not generally mandatory for each bank, keeping the articles of the new regulation and directive is compulsory for the banks funded and operating in territory of the European Union.

The regulation expects that the following information should be disclosed:

- Decision making process via which the remuneration of the material risks takers is determined;
- Number of sessions of remuneration committee held in the previous year;
- Constitution of the remuneration committee and its mandate;
- Connection between the long term profit of the bank and the long term remuneration of the material risk takers;
- Key points of the elaborated compensation system;
- Method of performance measurement;
- Retrospective corrective actions linked to the risks arisen that give opportunity to the bank to use malus or claw-back system;
- Applied rules concerning deferred compensation;
- Ratio (comparing with the amount of the total remuneration) and amount of the paid fixed remuneration in the given financial year;
- Ratio (comparing with the amount of the total remuneration) and amount of the awarded variable remuneration in the given financial year;
- Criteria of awarding shares, options or other financial instruments;
- Amount of the total remuneration split into activity segments;
- Amount of the total remuneration split into cash, shares, share based pay and other financial assets;
- Amount of the total variable remuneration split into shares, shares based pay and other financial assets;
- Amount of the deferred remuneration;
- Amount of the total remuneration split into management and remaining material risk takers;
- Paid deferred remuneration awarded in the previous years.

The Directive deals with the remuneration in more detailed form. According to the Directive the remuneration could be split into two main parts.

The first part of the compensation is the fixed based salary. It mirrors the professional experience of the employees in question as well as the functions fulfilled by them.

The second part of the compensation is based on performance and is variable. Generally, the variable part could not be higher than the fixed part. In other words, the variable compensation could not be higher than 100 % of the fixed part. However, the general meeting of the bank or owners of the bank have right to define higher ration. Even if higher ration has been approved, its measure must be lower than 200% of the fixed part. However, in Murphy's opinion, the reaction of the banks will be contra-productive. Applying this rule, banks will raise the fixed part of the remuneration of material risk takers and their variable remuneration will remain relatively on lower lever. Consequently, these measures will reduce the competitiveness of the European banks.

When terminating a contract, the related award should be in line with the related risk levels.

According to the Directive, at least 40% of the variable remuneration is to be paid at least in 3-5 years deferred period. Furthermore, the deferred part could be vested if the financial situation of the credit institution allows it and if it is reasonable based on the performance of the institution, the organizational unit and the employee.

3. Data, Methodology

This section deals with data of actual remuneration of MRTs of top 18 European banks¹ used in the calculation as well as the applied methodology. During the analysis the following was examined:

1. The ratio of the material risk takers comparing with the total number of employees;
2. The relation between the number of material risk takers and the balance sheet total of the selected 18 banks;
3. The relation between the number of material risk takers and the net income of the selected 18 banks;
4. The average remuneration of the material risk takers;
5. The ratio of the fixed and variable parts, non-deferred and deferred parts, cash- and share-based parts of the variable remuneration.

¹ The selected banks were the followings: HSBC Holdings, BNP Paribas, Barclays, Deutsche Bank, Crédit Agricole, Royal Bank of Scotland, Société Générale, Santander Group, Groupe BPCE, Lloyds Banking Group, ING, UBS, Credit Suisse, Rabobank, BBVA, Standard Chartered, Commerzbank, AIB. As it is observable two of the banks above were funded in Switzerland, others must keep the rules of CRR/CRDIV.

Excluding the Swiss banks, the aggregated balance sheet total of the banks in the sample is amounted to 17,694,030 million EUR as of 31/12/2013 which is 44.93% of the aggregated balance sheet total of the bank sector in the European Union.

As for net interest income, the aggregated net interest income of the listed 16 banks (excluding two Swiss banks) is 47.57% of the aggregated net interest income of each bank in the EU. At the time of compiling the article, data for year 2014 has already been disclosed by the selected banks but the aggregated balance sheet data of each European bank provided in Statistical Data Warehouse of the European Central Bank were not available for year 2014. It is the reason for indicating comparative data of year end 2013. However, significant changes in the abovementioned ratios did not occur in time period 2011-2013. The ratio of the total assets of the analysed 16 banks (excluding two Swiss banks) was 45.15% and 44.83% comparing with the total assets of each bank in the European Union in 2012 and 2011. Also, there was not significant change in portion of the net interest income of the selected 16 banks (48.69% in 2012 and 49.56% in 2011).

Therefore, it could be stated that the selected banks cover close to half of the whole European bank sector. Though, the number of observation used in calculation is low, these banks represents close to half of the whole European banking system in terms of total assets and net interest income.

Each analysed bank specified the amount of the total remuneration of the year in their annual or Pillar 3 reports but the deferred and non-deferred parts as well as the cash based or share based vesting parts were not given by each bank. The lack of certain data to be disclosed by the banks made the detailed analysis difficult. If certain data of a bank were not available for the analysis this bank was excluded from the calculation.

The following models and calculation was applied in the analysis:

1. The ratio of the material risk takers comparing with the total number of employees

Simple average calculation was applied in order to compare the number of material risk takers with the number of staff employed by the 18 selected banks.

2. The relation between the number of material risk takers and the balance sheet total of the selected 18 banks

When the connection between the number of MRTs and the balance sheet total of the banks was examined, simple linear regression analysis was used where the number of material risk takers was the dependent and the balance sheet total (total assets) of the examined banks was the predictor variable. Any of y_i can be expressed by the following formula:

$$y_i = \beta_0 + \beta_1 x_i + e_i \quad (1)$$

where

y_i is the i -th dependent variable (number of risk takers),

x_i is the i -th predictor variable (total assets),

β_0 is constant (the intercept of the line at y axis),

β_1 is the slope of the line (the coefficient of the predictor variable),

e_i is the residual value, in other words the difference between the value predicted by the model and the actual value at i -th observation.

Naturally, there are infinite pairs of β_0 and β_1 but we can find such pair of β_0 and β_1 where sum of square of e_i -s is the lowest:

$$SSE = \min(\sum_{i=1}^n e_i^2) \quad (2)$$

where SSE is the lowest sum of squares of e_i -s.

Since e_i is sometimes lower and is sometimes higher than the predicted value, their effect may reverse. That is the reason for using squares. In case of pairs of β_0 and β_1 where the sum of squares is the lowest, the following formula describes the most matching line:

$$\hat{y}_i = \beta_0 + \beta_1 x_i \quad (3)$$

In that case,

$$\beta_1 = \frac{\sum_{i=1}^n (x_i - \bar{x})(x_i - \bar{y})}{\sum_{i=1}^n (x_i - \bar{x})^2} \quad (4)$$

and

$$\beta_0 = \bar{y} - \beta_1 \bar{x} \quad (5)$$

where

\bar{x} is the mean of the predictor values and

\bar{y} is the mean of the dependent variables.

The above described process is the so called ordinary least squares method.

When determining the most matching line, the tightness of the correlation was also examined by calculating the linear correlation coefficient:

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(x_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \cdot \sum_{i=1}^n (y_i - \bar{y})^2}} \quad (6)$$

3. The relation between the number of material risk takers and the net income of the selected 18 banks

The above listed methodology was also applied when examining the relation between the number of MRTs and the net income of the banks.

4. The average remuneration of the material risk takers

Also, the average remuneration of material risk takers was determined in two kinds of approaches. On the one hand banks have to disclose the summarized data of remuneration as per salary bands. In the calculation the band average was weighted by the number of material risk takers belonging to the respective band. On the other hand banks have disclosed the total amount of the remuneration provided to the MRTs and these data were used in the simple arithmetical average calculation.

5. Ratio of the fixed and variable parts, non-deferred and deferred parts, cash- and share-based parts of the variable remuneration

In this case simple percentage calculation was used in the calculation.

4. Results, Discussion

1. The ratio of the material risk takers comparing with the total number of employees

The selected 18 banks employed 1,871 thousand employees (full time equivalent) out of which there were 15,955 material risk takers at the end of 2014. It means that 0.85% of the employees were identified as material risk taker. That is, the banks identified only the top managers as material risk takers. The requirements in the regulations do not exactly determine who has to be classified as material risk takers, therefore, banks could tightly interpret this classification.

2. The relation between the number of material risk takers and the balance sheet total of the selected 18 banks

The number of MRTs might depend on numerous factors: the structure of the banking group, the geographical extent, the implemented risk management system, the extent of the bank. Analysing how the number of MRTs depends on the balance sheet total of the banks, the following chart shows the connection between the extent of the banks and the number of material risk takers expressed in full time equivalent (FTE) indicator.

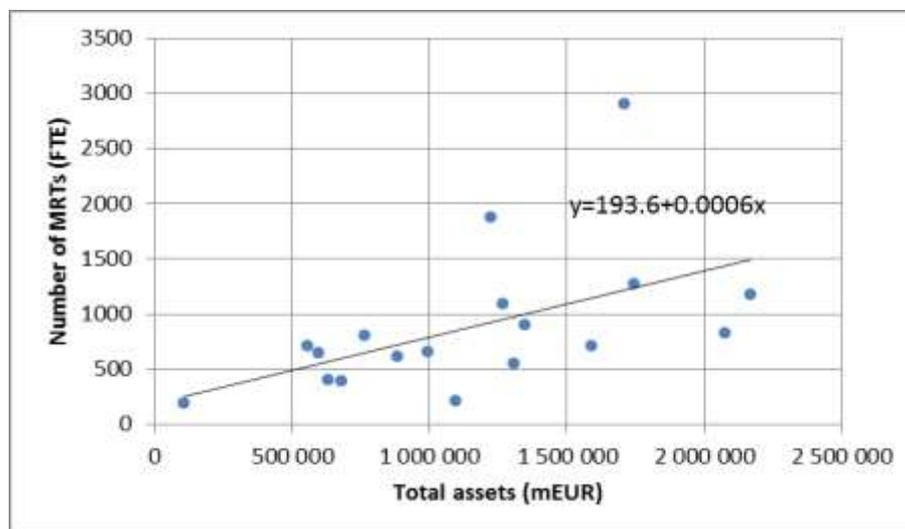


Chart 1. Connection between total assets and number of MRTs

Source: IFRS and Pillar 3 reports of the analysed banks, own calculation

As it is well observable, the numbers of MRTs are around a line (except for two extreme cases). This line expresses that in case the balance sheet total (total assets) increases by 1 000 million EUR the number of the material risk takers increases by 0.6 headcount. However, the connection is not too strong (the value of correlation coefficient is 0.52). Anyway, it can be concluded that the growth in the total assets generates growth in number of material risk takers. Nevertheless, it can be proven that there is much stronger correlation between the number of employees and the total assets. If it is analysed the correlation coefficient is 0.78. It means that increasing in the total assets generates higher ration increasing in the number of banking employees than increasing in the ratio of the number of material risk takers. This fact also underpins such presumption that probably there are more employees in the banks who have dominant effect on risk taking of the banks.

3. The relation between the number of material risk takers and the net income of the selected 18 banks

Since the long term success of the MRTs' activity might be expressed by the net interest income of the bank, we should compare the number of material risk takers and the profit originating from net interest income of the banks. In the approach above, when the number of MRTs and total asset of the bank were compared, it was supposed that the extent of the bank determines the number of risk takers, which is natural. However, if we want to compare the numbers of MRTs with the net interest income of the banks there is no unambiguous determination. On the one hand the number of risk takers has effect on the interest income. On the other hand the extent

of the net interest income depends on the measure of the total assets of a bank. Therefore, the net interest income may have indirect effect on number of MRTs.

The following two charts show both cases.

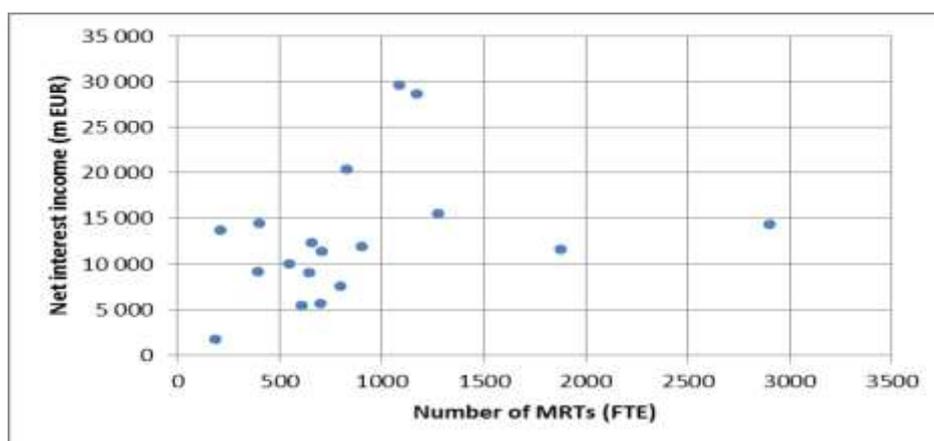


Chart 2. Number of MRTs as dependent variable of the net interest incomes

Source: IFRS and Pillar 3 reports of the analysed banks, own calculation

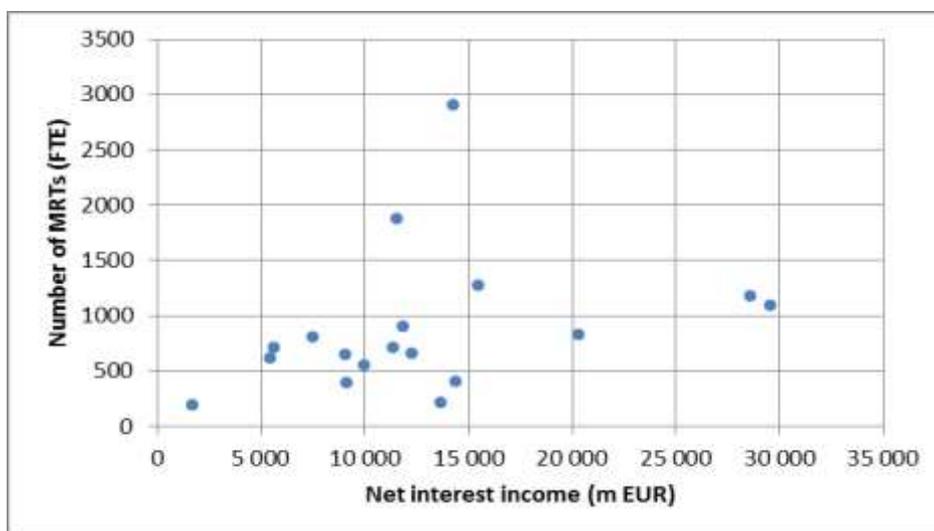


Chart 3. Net interest incomes as dependent variable of number of MRTs

Source: IFRS and Pillar 3 reports of the analysed banks, own calculation

There is weak correlation between the numbers of material risk takers and net interest income of the analysed banks (the correlation coefficient is 0.31). It means that the number of material risk takers have no actual effect on the banking result.

4. The average remuneration of the material risk takers

As for distribution of the remuneration, significant part (82.13%) of the material risk takers has been awarded less than 1 million EUR.

Further 9.54% of the MRTs has been awarded less than 1.5 million EUR. The following chart shows the distribution of the awarded remuneration.

In case of 4 banks and 1998 material risk takers there is no disclosed information on distribution of remuneration. Therefore, the data in the following chart cover 14 banks and 13957 MRTs. The Chart 4 depicts the summarized number of material risk takers as per belonging bands as of 31/12/2014.

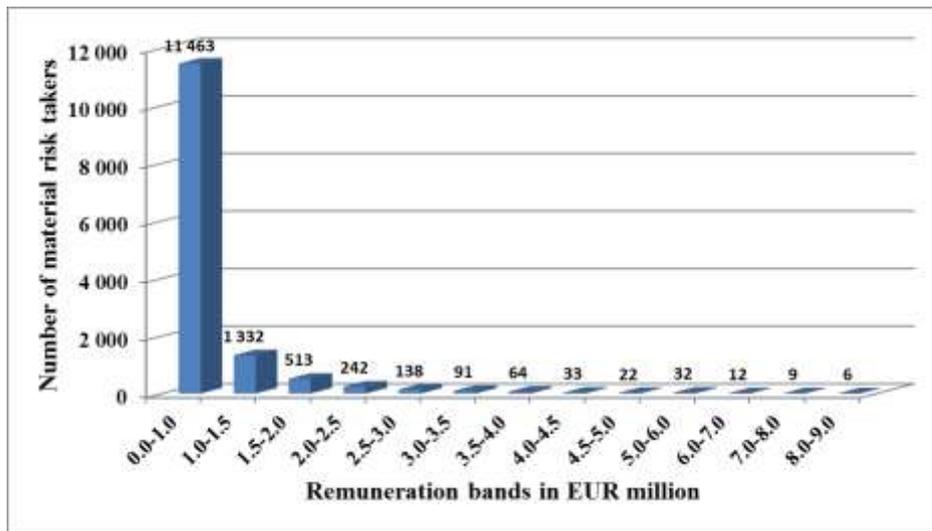


Chart 4. Distribution of the remuneration of material risk takers as per remuneration bands in the analysed banks

Source: IFRS and Pillar 3 reports of the analysed banks, own calculation

If we weight the medium of the bands with the related number of employees, we get the average remuneration of the MRTs. The calculation is the following:

$$\left(0 + \frac{999999 - 0}{2}\right) \cdot \frac{11463}{13957} + \left(1000000 + \frac{1499999 - 1000000}{2}\right) \cdot \frac{1332}{13957} + \dots$$

$$\dots + \left(8000000 + \frac{8999999 - 8000000}{2}\right) \cdot \frac{6}{13957} = 743085 \quad (7)$$

The average remuneration of the MRTs is 743,085 EUR in 2014.

Unfortunately, the calculation above is not too accurate in (7) because it used the average of the minimum and maximum values of the bands.

In order to make more precise analysis we could use detailed data on remuneration disclosed by the banks. Taking the disclosed detailed remuneration data into account the average remuneration of the selected 18 banks and 15955 material risk takers was 781,757 EUR in 2014. This average is close to the average determined above in case of 14 banks and approximately ten times higher than the average remuneration of the banking employees.

5. Ratio of the fixed and variable parts, non-deferred and deferred parts, cash- and share-based parts of the variable remuneration

The quotient of variable and fixed part can also be determined based on the disclosed data. This quotient is 1.12. It means that the variable part of the remuneration is higher than the fixed part. As it was mentioned above, the variable component shall not exceed 100 % of the fixed component of the total remuneration but member states of European Union may allow owners of the banks to approve higher level of the ratio between the fixed and variable components of remuneration. Even if it is allowed, the overall level of the variable component shall not exceed 200 % of the fixed component of the total remuneration. In 6 cases of 18 the variable part of the remuneration was higher than the fixed part and in 2 cases this ratio was higher than 200%. However, these banks do not have to keep the rules of CRR/CRDIV these banks were founded in Switzerland.

As for retained component of the variable remuneration, 14 banks of 18 disclosed data on deferred and non-deferred remuneration. In case of these banks, 69.12% of the variable remuneration was deferred.

As for vesting type of variable remuneration, 13 banks provided these types. Based on the data disclosed by them, 64.78% of the non-deferred remuneration and 21.41% of the deferred remuneration was paid in cash.

The following chart shows the distribution of remuneration as per components. Data include 13 such banks that specified detailed data.

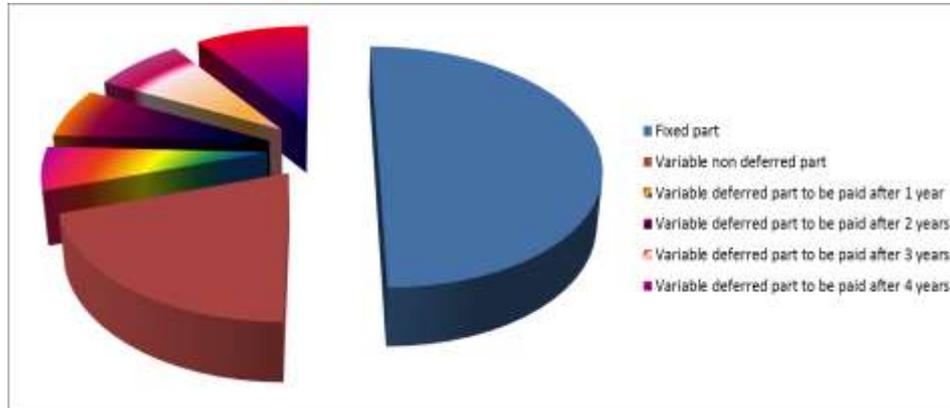


Chart 5. Distribution of the different types of the remuneration

Source: IFRS and Pillar 3 reports of the analysed banks, own calculation

The largest portion is the fixed remuneration and after that the variable non deferred remuneration follows. The deferred parts are distributed close to equal portions.

6. Conclusion

Crisis started in 2007 attracted attention for banking managerial remuneration. In 2009, the Financial Stability Forum was the first organization that issued principles so as to give guidance to internally regulate the managerial compensation system of the banks. After that, numerous expectations, standards, recommendations have been given by different international organizations but the capital requirement regulation and the related directive of the European Parliament and Council are the most important for European banks.

The article analysed the actual remuneration data of year 2014 disclosed by 18 European top banks and found correlation between number of material risk takers and value of total assets of the banks. However, strong connection between banking performance and the level of managerial remuneration was not found. Just a minor part of the employees has been identified as material risk taker in the bank which is probably not in line with the practice.

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Performance Evaluation of Some Index Funds-Indian Perspective

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Abstract: The popularity of the index funds as an investment option has increased manifold ever since they were introduced. This is primarily because of the merits that the investor enjoys through passive style of funds management. This includes the low cost involved in managing such funds and the significant tax savings. Most of the researchers have compared the performance of the actively managed funds with that of index funds. However the index funds of US and for that reason other parts of the world are different from that of India. Unlike other countries in India the benchmark indices comprise of very less number of securities and thus are unable to represent the entire economy. So in Indian context comparison of performance of actively managed funds with index funds is not logical. Therefore this paper attempts to make an intra-class performance evaluation of some Indian index funds based on some statistics. The study includes the use of graphical interpretations coupled with statistical tools like R-square and tracking error values. Two models of tracking error have been employed to test empirically the performance of the selected index funds. The study is useful for those interested in mutual funds, which includes researchers, academicians, and financial advisors. The paper suits the requirement and the situations prevalent in Indian economy during the period under study.

Keywords: Index funds; Passive fund management; Benchmark indices; Investment option; Performance evaluation.

JEL Classification: G11; G23

1 Introduction

The common investors in India prefer to invest in the capital market through a Mutual fund rather than direct investments. This has given impetus to the growth of the Mutual fund industry. The primary reason behind such a behavior is the risk avoiding nature of the investor coupled with the lack of sound knowledge of the intricacies with which the capital market operates. So they believe that the fund manager with his expertise would be the best person to handle their hard earned money.

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Mutual fund is a Trust where money is pooled from a group of investors who happen to share common financial objectives. The funds thus collected are invested into asset classes that closely match the stated investment goals of the scheme. A fund manager manages the Mutual fund and uses his portfolio management skills and ensures a better return than what an investor is expected to manage on his own. The manager also utilizes the research going on in the industry to arrive at a decision.

The concept of Mutual Fund first came from a Dutch Merchant Ling in the year 1774. In 1822, that idea was further developed. In India this concept was introduced in 1963. From an historical point of view, Mutual Funds have been around four hundred years, but they are a relatively new investment phenomenon to novice investors. Mutual Funds are a conglomeration of stocks, bonds, securities and even real estate, put together by a smart Fund Manager who hand-picks winners for a winning combination. (Athma & Mamatha, 2013).

Fund Managers use different investment styles in consonance with the investment objectives of the concerned scheme. Some funds are actively managed while others are not. The passively managed funds are commonly termed as the index fund. The popularity of the index funds as an investment option has increased manifolds ever since they were introduced. This is primarily because of the merits that the investor enjoys through passive style of funds management. This includes the low cost involved in managing such funds and the significant tax savings (Fortin & Michelson, 2002).

Index Funds replicate the portfolio of a particular index such as the BSE Sensitive index, S&P NSE 50 index (Nifty), etc. These schemes invest in the securities in the same proportion comprising of an index (www.utimf.com/). Theoretically NAVs of such schemes would rise or fall in accordance with the rise or fall in the index, though not exactly by the same percentage due to some factors known as "tracking error" in technical terms. There are various reasons for occurrence of such tracking errors which eventually have become the yardstick for measuring the performance of such index funds (Frino & Gallagher, 2001)

Some of the factors that cause tracking error in index funds are enumerated here. One of the prime reasons being, that, the benchmark index is maintained more like a paper portfolio than reality (Perold, 1988). Any change in the composition of the benchmark index requires some time for the fund manager of the index fund to replicate the new composition. Further this also entails some buying and selling on the part of the index fund which raises its cost where on the other hand returns from the benchmark index are assumed to be received without incurring any cost. Secondly the way the benchmark index is calculated also has a bearing on the possibility and quantum of the tracking error. Thirdly if the index fund does not exactly mirror its benchmark there will be some tracking error. Some stocks may be liquid enough to be included in the benchmark index, but not quite liquid enough to

be bought by the index fund and if included affect the stock's price (Keim, 1999). Another notable point is the treatment of dividend in the benchmark index.

Warren Buffett and Benjamin Graham have recommended index funds as one of the best investment tool for small investors who don't have the capacity to select their own quality stocks or Mutual funds. This is exactly what asset management companies of index funds have been using as their justification to sell such funds in India for long. However this logic holds good for a market like America where the index funds are true indicators of the market at large owing to the fact that they track indices containing 500 to 5000 stocks (www.safalniveshak.com/). That is probably the most significant reason for research gap in this area specifically in Indian context.

In India, we have just two important indices available – the 30 stock BSE-Sensex and the 50 stock NSE-Nifty. Such a small number of companies are anyways not indicative of the broader Indian market. What is more concerning is, the way the Sensex (or the Nifty) are constructed makes them just a shabby collection of big companies/expensive stocks. In such a situation, performance evaluation of the index funds becomes significant, that too intra-class comparison (www.safalniveshak.com/). These traits of the Indian index funds make them appropriate for the novice investor who is content with just moderate return above the usual fixed deposits in any bank or the retired investors who cannot afford to take risk involved in actively managed funds. According to Jaya Prakash, Head, Products, Franklin Templeton Investments, India, index funds are ideal for investors who prefer to take only market risk and not a fund manager risk (www.businessstoday.in). Whether actively managed funds have an edge over the passively managed index funds remain a debatable issue and we feel that this varies from economy to economy.

2 Literature Review

Athma and Mamatha (2013) studied the growth and progress of ETFs (Exchange Traded Funds) and Index funds in India starting from 1998. Narend (2014) empirically studied the performance of some index funds and ETFs based on tracking error, active returns and Jensen's alfa. Similar works are also reported from other parts of the world. Philips *et al*(2014) compared the performance of the actively managed funds vis-à-vis the index funds and found that index funds displayed a greater probability of outperforming the actively managed funds even though index funds generally underperform their benchmarks. These findings support the conclusions drawn by Benke & Ferri (2013)earlier. Other notable works which need a mention are- Rhompotis (2005) comparing ETFs with index funds, Oh *et al* (2005) proposing a model to optimize investments in index funds. Elton *et al* (2004) evaluated the performance of a few mutual funds. Tracking error of some S&P 500 index funds was reported by Frino & Gallagher (2001).

The first attempt to quantify the difference in portfolio performance between the two strategies was made by Larry Martin (1993). Many authors in succession have worked on similar lines and more or less confirmed the same findings that in general low expensed index funds outperform the high expensed actively managed Mutual funds.

However in the Indian scenario a comparison between the index funds and actively managed funds is not warranted. This is because in India the usual benchmarks namely Sensex and Nifty comprises of only thirty and fifty stocks respectively and is thus not representative of the entire market. In US and abroad the benchmark indices comprise of much larger number of stocks and hence very well represent the market as a whole. In a country like India an intra-class comparison of index funds seems more justifiable in our opinion.

Keeping this research gap in mind this study has been taken up to evaluate the performance of seven selected index funds and undertake a comparison among them.

3 Research Methodology

3.1 Objective

This paper attempts to evaluate some of the index funds from the Indian Mutual fund industry.

3.2 Hypothesis

H₀: Passively managed Mutual funds reap returns equal to that of the benchmark index.

H₁: Passively managed Mutual funds do deviate from the benchmark index with respect to returns and thus give rise to tracking error.

3.3 Scope

The study covers a period of five years and nine months starting from April 2010 to December 2015. Such short duration study is warranted as the economic scenario in a fast developing economy like India is prone to changes. The paper takes into account the performance of seven index funds operative in India whose benchmark index is the Nifty index of the NSE (National Stock Exchange). The names of index funds under study are mentioned in Table 1.

Table 1. List of Index Funds Under Study

S.No.	Name of the Index fund	Investment Option
1.	UTI-Nifty Index	Growth Option
2.	HDFC Index fund-Nifty plan	Growth Option
3.	ICICI Pru Index Fund	Growth Option
4.	Birla Sun Life Index Fund	Growth Option
5.	SBI Nifty Index Fund	Growth Option
6.	Franklin Templeton India Index-Nifty plan	Growth Option
7.	Tata Index Fund-Plan A (Nifty)	Growth Option

3.4 Research Design

The study is empirical in nature and purely based on secondary data. Quarterly NAV of the selected index funds are taken from their respective websites of the Asset Management Company (AMC) starting from 01st April 2010. From these NAVs quarterly returns are calculated for all the seven index funds.

At the same time CNX Nifty index values are obtained for the period under study from www.nseindia.com. All the seven selected index funds have their benchmark as the CNX Nifty. Hence quarterly returns of Nifty are calculated next. In theory an index fund is expected to mimic its benchmark so the graph showing the returns from an index fund can be superimposed on the graph showing returns from the benchmark that is CNX Nifty. That would be an indicator of how closely the index fund is able to represent its benchmark and provide its investors the benefits of passive management.

Next tracking error is calculated for the index fund using the following two methods and represented as tracking error 1 (TE₁) and tracking error 2 (TE₂). Tracking error measures the deviation of the Mutual fund's return from that of its benchmark. Every index fund aims at minimizing the tracking error as much as possible but the same cannot be eliminated altogether.

TE₁ in quarter t is calculated as the absolute difference in returns of the index portfolio and benchmark index ($e_{pt} = R_{pt} - R_{bt}$),

Where, R_{pt} is the return from the index fund under consideration and

R_{bt} is the return from the benchmark index.

The quarterly average absolute tracking error over n quarters (TE₁) is defined as follows:

$$TE_1 = \sum |e_{pt}|/n$$

An alternative measure i.e. TE₂ which is mostly used in industry, measures the quarter-to-quarter variability (standard deviation) of the difference in returns between the index fund and the benchmark index return.

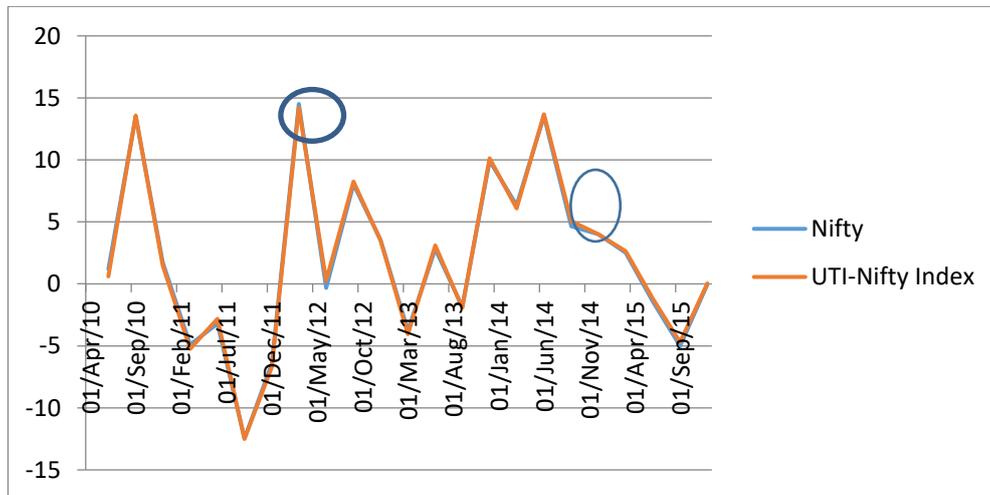
$$TE_2 = \sqrt{1/(n-1)\sum(e_{pt}-e_{pt}')^2}$$

The index fund with the least tracking error is the best among the seven funds selected.

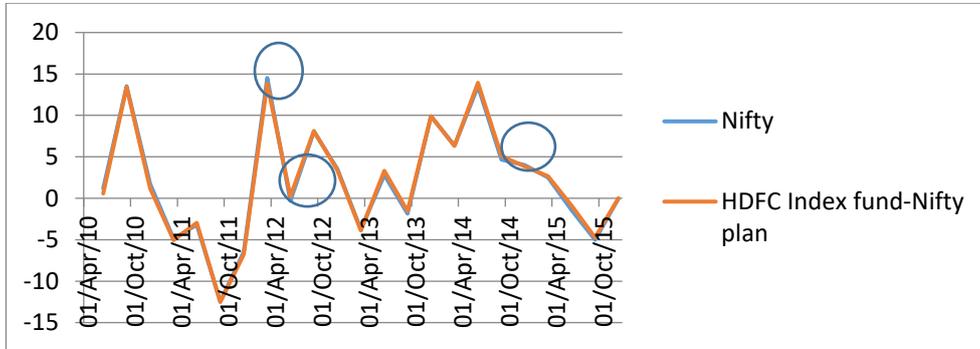
Next R-square values are calculated for the index funds with respect to the CNX Nifty to determine how closely the fund is able to replicate its benchmark. The value of R-square varies between 0 to 1. A high R-square value indicates near perfect replication.

4 Empirical Findings

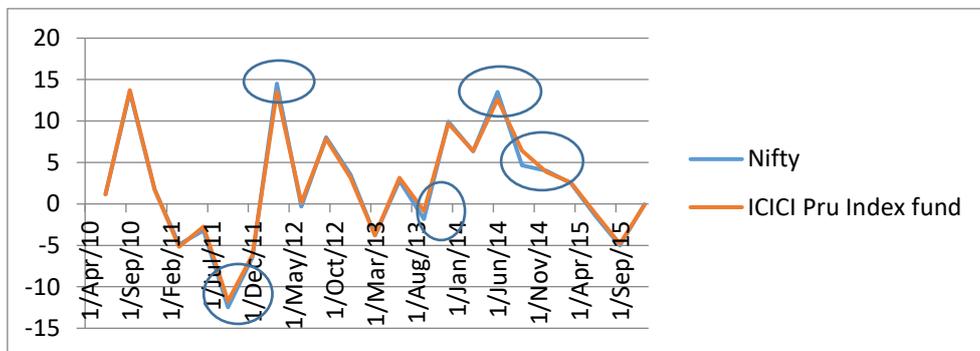
In order to work on the above mentioned methodology graphs showing the time period on X-axis and quarterly returns from the selected index funds on Y-axis are drawn. Similar graph is drawn for the quarterly returns from the benchmark index i.e. Nifty. These were then superimposed. The graphs so plotted are depicted below (Graph 1-7).



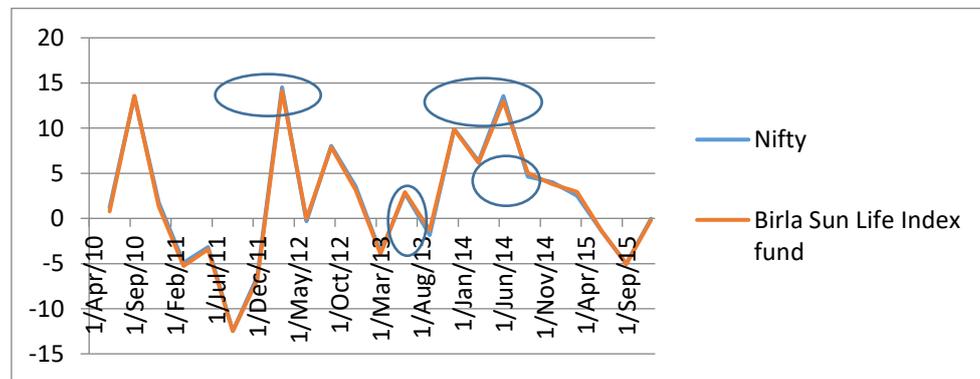
Graph 1. Quarterly Returns from UTI Nifty fund vs. Nifty



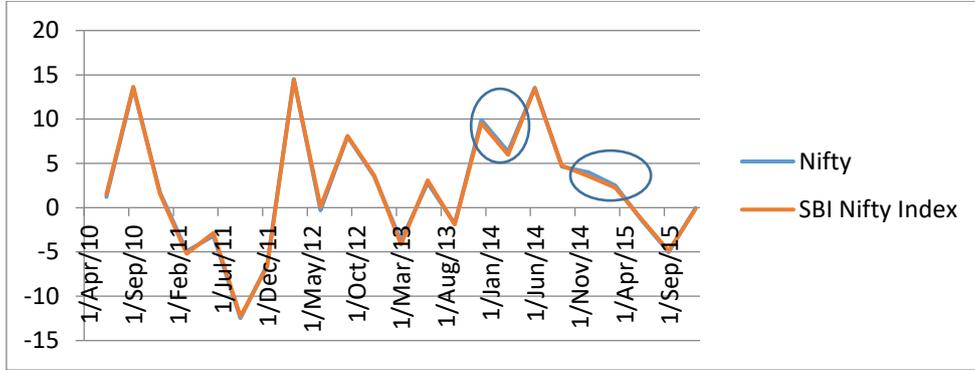
Graph 2. Quarterly Returns from HDFC Index fund-Nifty plan vs. Nifty



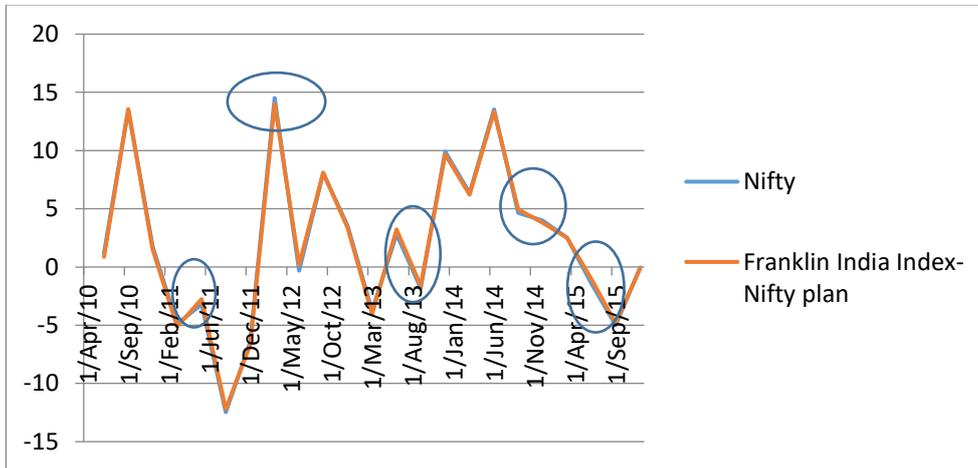
Graph 3. Quarterly Returns from ICICI Pru Index fund vs. Nifty



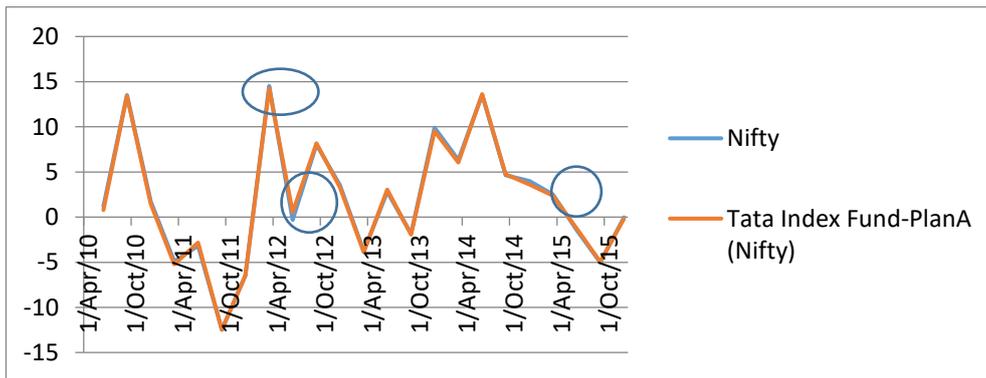
Graph 4. Quarterly Returns from Birla Sun Life Index fund vs. Nifty



Graph 5. Quarterly Returns from SBI Nifty Index fund vs. Nifty



Graph 6. Quarterly Returns from Franklin India Index-Nifty plan vs. Nifty



Graph 7. Quarterly Returns from Tata Index fund-Nifty plan vs. Nifty

A perusal of the graphs so drawn showed there are some deviations at some points highlighted by encircling. These observations necessitate the calculation of tracking error to quantify the deviations.

The tracking errors, and the charts made thereon are shown below in Table 2& 3 and Charts 1&2 respectively.

Table 2. Tracking Error-1 Values

Funds	TE ₁
UTI-Nifty Index	0.24
HDFC Index fund-Nifty	0.28
ICICI Pru Index fund	0.40
Birla Sun Life Index fund	0.25
SBI Nifty Index fund	0.22
Franklin India Index fund	0.25
Tata Index fund-Nifty plan	0.23

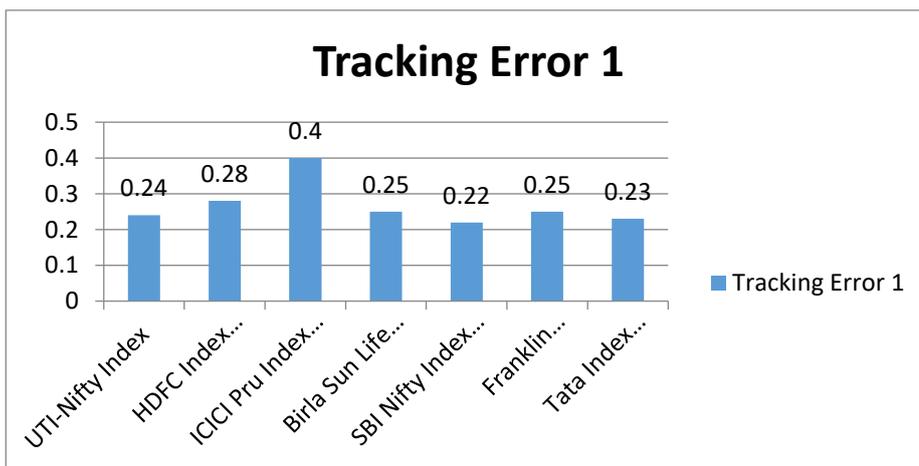
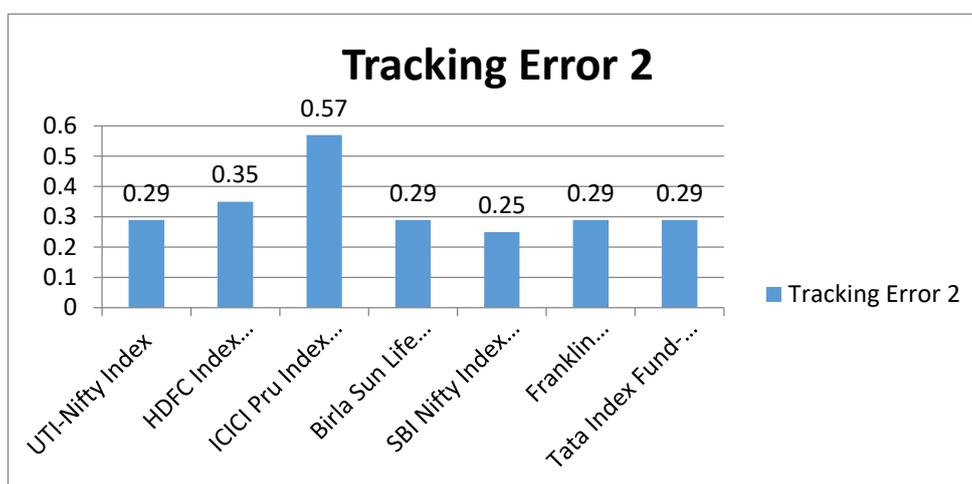


Chart 1. Tracking Error-1

Table 3 Tracking Error-2 Values

Funds	TE ₂
UTI-Nifty Index	0.29
HDFC Index fund-Nifty	0.35
ICICI Pru Index fund	0.57
Birla Sun Life Index fund	0.29
SBI Nifty Index fund	0.25
Franklin India Index fund	0.29
Tata Index fund-Nifty plan	0.29

**Chart 2. Tracking Error-2**

Study of the Table 2 reveals that Tracking error TE₁ in absolute terms averaged out to be 0.27% with the maximum of 0.4 % in case of ICICI Pru Index fund and the least being 0.22 % for SBI Nifty Index fund.

Table 3 made for tracking error 2 shows that on an average TE₂ value is found to be around 0.33 %. The lowest value is 0.25 % for SBI Nifty Index fund and the highest being 0.57 % pertaining to ICICI Pru Index fund.

Next the value of coefficient of determination or R-square, is determined for each of the seven index funds with respect to the benchmark index as shown in the Table 4 and Chart 3 below.

Table 4. R-square Values

Funds	R ²
UTI-Nifty Index	0.998
HDFC Index fund-Nifty	0.997
ICICI Pru Index fund	0.994
Birla Sun Life Index fund	0.998
SBI Nifty Index fund	0.999
Franklin India Index fund	0.998
Tata Index fund-Nifty plan	0.998

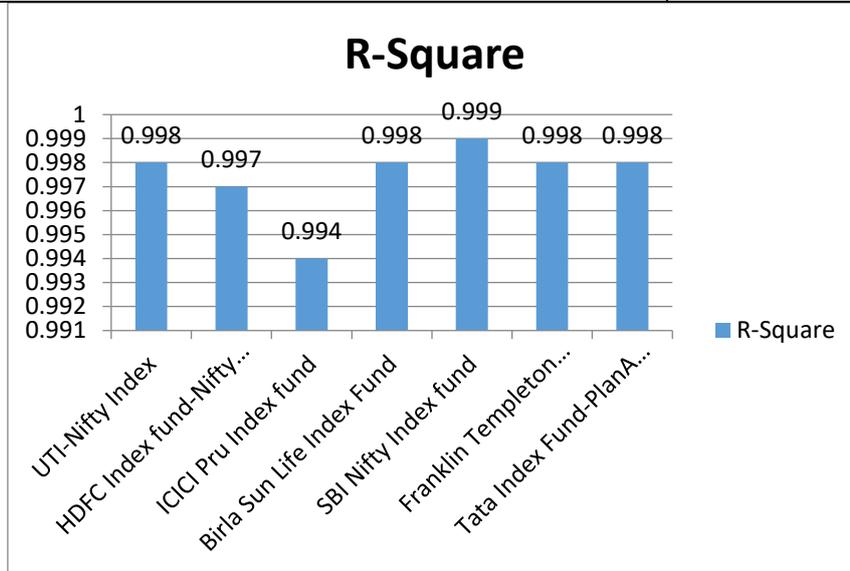


Chart 3. R-square

R-square value indicates how well the data fits a line or a curve. An r^2 of 1.00 indicates that the regression line perfectly fits the data while an r^2 of 0.00 shows that the line does not fit the data at all.

The values of R-square indicate that all the funds under study are able to replicate the returns of the benchmark index with minor deviations. The below table and graph clarify this point.

5. Conclusion

The empirical results in this paper shows that with all the three measures used to evaluate the performance of the selected index funds, SBI Nifty Index fund has outperformed the other six index fund during the period under study. The fund manager managing SBI Nifty Index fund is able to limit the tracking error to an acceptable limit. The findings clearly indicate that the null hypothesis has been rejected by all the three statistics used namely tracking error-1, tracking error-2 and R-square value. These results should be analyzed with some caveats. This paper does not take into account for the expenses involved in restructuring the portfolio of the fund with each change in the composition of the benchmark index. These issues are left open for further research.

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