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REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

ACKNOWLEDGMENTS

REFERENCES

APPENDIX/ANNEXURE

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BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.
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WEBSITES

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

NON-DISCLOSURE PRACTICES OF INTEREST RATE AND COMPOUNDING FREQUENCY IN SINKING FUND PROPOSALS BY THE BANKS OPERATING IN BANGLADESH: A SERIOUS PITFALL FOR INVESTORS

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ABSTRACT

Economic development essentially depends on the ultimate savings by people and the resulting investment by the proper utilization of such savings. Undoubtedly, banks and financial institutions operating in an economy play the significant role to persuade people for savings. By means of creating fixed deposit, different sinking fund provision and other types of funds, banks normally extend their hands to play this important role. This study mainly focuses only on Sinking Fund offerings of banks and attempts to find out the disclosure level of information regarding interest rate and compounding frequency required for better decision by the investor. At the same time, this study reveals the possible pitfalls due to non disclosure of such vital information. To depict a meaningful result, the analysis rests on the sample size of 20 commercial banks of different categories and the analysis greatly bases on different data only available from those selected sample size. Finally, the study finds that non-disclosing of interest rate and compounding frequency are more common in sinking fund offerings by banks and discrepancy in investors' return eventually may prevail due to the unavailability of such vital information. Finally, the study extends some recommendations to overcome the underlying pitfall for the betterment of the investors.

KEYWORDS
Sinking Fund, Compounding Frequency, Interest Rate, Information Disclosure, Discrepancy in Return.

1. INTRODUCTION

By means of Sinking Fund provisions offered by banks and financial institutions operating in Bangladesh, not only people from different income level can save part of their income but also investors and analysts can take the right decisions for their required project(s). The compounding rate used into the normal future value annuity formula for the calculation of return has been the benchmark in appraising any project or investment. Investors have the option of investing into a new project, creating a new business venture, expanding the existing operations, and so forth. Among all the alternative options, every investor must seek the opportunity cost i.e. the benefit forgone from the next best alternative from his or her new investment. Even, the fixed-income level people considers the most beneficial sector from where they can earn more from their savings either through part-time business or making long-term deposits into the bank. Opportunity cost considerations help people choose the best investment alternative. However, this is the compounding rate or discounting rate primarily provides the ground for analyzing the choices. The information of such interest rate is very much essential for the calculation. But, it is a matter of surprising fact that a large number of banks operating in Bangladesh do not provide such types of actual interest rate through brochures, website or other promotional materials. Wonders reach to the peak, when no information regarding the compounding frequency is found from the documents of such financial institutions. Undoubtedly, compounding rate (i.e. interest rate) and compounding frequency is mandatory for calculating the total returns from this type of sinking fund. Hence, real analysis becomes not possible and so the comparison becomes then more cumbersome for most of the savers as well as investors and due to the unavailability of that information people even receive less return from many of the financial institutions. The study mainly focuses to find out of such impediments and tries to measure the discrepancy between the maturity values banks operating in Bangladesh really provides to the people and the maturity value that should come from the calculations.

2. RATIONAL OF THE STUDY

In Wikipedia, a clear statement is found in a page[1] about the disclosure of interest rate and compounding time. The page tells "In order to define an interest rate fully, and enable one to compare it with other interest rates, the interest rate *and* the compounding frequency must be disclosed. Since most people prefer to think of rates as a yearly percentage, many governments require financial institutions to disclose the equivalent yearly compounded interest rate on deposits or advances."

The most important matter in that case is that "The effect of compounding depends on the frequency[2] with which interest is compounded and the periodic interest rate which is applied. Therefore, in order to define accurately the amount to be paid under a legal contract with interest, the frequency of compounding (yearly, half-yearly, quarterly, monthly, daily, etc.) *and* the interest rate must be specified."

Actually, in case of any Sinking Fund Provision, utilization of sinking fund rate (i.e. interest rate compounding) can direct an investor to compare the internal rate of return from any new business initiatives. Because there is also the question of opportunity cost in that the depository party lost other possibilities of using the deposited money into the sinking fund. Economically, the interest rate is the cost of capital and is subject to the laws of supply and demand of the money supply. Investment appraisal tools such as IRR, NPV etc. require the use of interest rate. The analyst can compare the return from alternative choices (i.e. Return on Equity of alternative choices-ROE) with the rate provided by the banks. For example, if a bank provides 12% interest rate and IRR from a possible suitable project is 14%, then it becomes easier for the investor that he or she should not invest into the sinking fund rather invest into the new project as here IRR > the opportunity cost of capital i.e. here the next best benefit forgone is 12% from the bank. At the same time, people from different walks of life normally do not familiar with the many financial calculations. A large number of banks do not disclose the required information very much essential for decision. This non-disclosure of essential data may even influence people investing into wrong project or business. To find out whether different banks disclose those vital information as well provide returns to the people in accordance with the returns the basic financial management theories or formulas indicate, this study has been attempted.

3. LITERATURE REVIEW

A lot of literature describes the interest rate and its impact on the economy. Adam Smith, Jeremy Smith, Jeremy Bentham and Mirabeau firstly provided the formal studies of interest rates and their impact on society during the birth of classic economic thought. The following literature helped in articulating the facts addressed through out the paper.

Wicksell, Knut (1898), a Swedish economist, in his *Interest and Prices* discussed an ample idea of economic crises based upon a distinction between natural and nominal interest rates. The discussion provides the profound basic regarding interest rate.

Fisher, Irving in the early 20th century, provided the most important breakthrough in analysis of interest rates from the economic view point by distinguishing nominal interest from real interest. Several ideas concerning the impact of interest rates have emerged from then.

Schall, Lawrence D; Haley, Charles W; in "Fundamentals of Financial Management"- 6th Edition, McGraw-Hill 1991, page-84-86 presented the detailed regarding the compounding procedure of the equal amounts deposited through out the stipulated period of time. Here, it is mentioned that the annuity compound amount factor (F/A, i, n) is the value at the end of n periods resulting from an investment of $ 1 per period for n periods at a rate of i percent per period and the future value F of an annuity of A dollars per year is, $F = A(F/A_{i,n})$

Graham, John; Smart, Scott B. in "Introduction to Corporate Finance"-3rd Edition (2011) at page – 82 provided the basic formula as FV (Annuity Due) = $PMT \times \frac{(1+r)^n - 1}{r} \times (1+r)$, where PMT is the periodic installment amount, r is the interest rate an n is the number of periods.

Horne, James C. Van; Jr., John M. Wachowicz; in "Fundamentals of Financial Management"-11th Edition, Pearson Education, 2001; at Page 60, mention that the

$$FVAD_n = R\left[\left[(1+i)^n - 1\right]/i\right](1+i) = R\left(FVIFA_{i,n}\right)(1+i)$$

future value of an annuity due at i percent for n periods (FVAD$_n$) as ; where FVIFA $_{i, n}$ is the future value interest factor annuity and R is the annuity for finding out the future value of an annuity due i.e. FVAD$_n$.

Gitman, Lawrence J. in "Principles of Managerial Finance"-10th Edition, Pearson Education, 2007, pages 162 – 169 discussed so elaborately about the future value calculation of an ordinary annuity as well as annuity due. For an ordinary annuity, the formula given is that $FVA_n = PMT \times (FVIF_{i,n})$, where PMT is the amount to be deposited to the end of each year and $FVIF_{i,n}$ is the appropriate future value interest factor for a one-dollar ordinary annuity compounded at i percent for n years. To find the future value of an annuity due i.e. when cash flow occurs at the start of the period, they just multiplied the ordinary annuity factor by only (1+i) and therefore the formula becomes $FVIF_{i,n}(Annuity\ due) = PMT \times (FVIF_{i,n}) \times (1+i)$.

Kieso, Donald E; Weygandt, Jerry J; Warfield, Terry D; in "Intermediate Accounting" -10th Edition, John Wiley & Sons, Inc. (2001) deliberates the idea concerning the future value of ordinary annuity and future value of annuity due (P:288-290) as well as the idea of future value of a deferred annuity (P: 294). They express future value of an ordinary annuity = R (FVF-OA $_{n, i}$) and future value of an annuity due, FV-AD = R (FVF-OA $_{n, i}$) × (1+i); Where R= Annuity or Periodic Amount, FVF-OA $_{n, i}$ = future value of an ordinary annuity factor for n periods at i interest. Future value of a deferred annuity also comes through the proper time adjusted uses of future value of an ordinary annuity i.e. R (FVF-OA $_{n, i}$). At the same time, the necessity of cautiously uses of compounding frequency required for such calculations also came in all of the above literatures.

Khan, Dr. A R in his book "Bank Management : A Fund Emphasis" published by Decent Book House, 135, Islamia Market, Nilkhet, Dhaka-1205, discussed different banking regulatory arrangements conducted as well as supervised by Bangladesh Bank-the central bank of Bangladesh. But the addressing of disclosures need pertaining interest rate and at the same time compounding frequency required for sinking fund scheme were absent fully.

Rose, Peter S.; and Hudgins, Sylvia C. in their "Bank Management & Financial Services" -6th Edition, McGraw Hill, 2005 provided all of the necessary description and analysis for managing the activities and to keep safe the fund of any bank. In that book, any thorough overview the regarding the disclosures of the interest rate and compounding frequency are not addressed.

Whigham, David (1998) in his "Quantitative Business Methods Using Excel" provides a detail analysis regarding the calculation of sinking fund accumulation. Here, he shows that how future accumulation can vary for different interest rate along with different compounding frequency. He also shows the fact that what discrepancy may occur if effective interest rate is not utilized when an installment for a sinking fund and compounding frequency does not follow the same frequency.

It is likely that different conventions may be used from country to country. One example can be sited regarding the regulation of such types in Canada that tells under the Disclosure of Interest (Banks) Regulations (SOR/92-321) under the sub heading of Disclosure in Respect of Deposit Accounts as (1) Subject to subsection (1.1), a bank shall disclose to a person who requests the bank to open a deposit account the rate of interest applicable to the deposit account and how the amount of interest to be paid is to be calculated.

A different scenario is found in case of regulations provided by Bangladesh Bank. A guide-line of 55 pages containing 22 instructions provided by Bangladesh Bank based on BRPD Circular No. 01 dated February 19, 1997 and BRPD Circular No. 01 dated January 10, 2004, entitled as "Prudential Regulations for Banks: Selected Issues" tells under the heading of 'Interest Rates on Deposit and Lending' that banks are now free to fix their rates of interest on their deposits of different types after withdrawal of restriction about the floor rate of interest in 1997 and banks are also free to fix their rates of interest on lending except for export sector, which has been fixed at 7%per annum with effect from January 10, 2004. At present, banks can differentiate interest rate up to 3% considering comparative risk elements involved among borrowers in same lending category. With progressive deregulation of interest rates, banks have been advised to announce the mid-rate of the limit (if any) for different sectors and the banks may change interest 1.5% more or less than the announced mid-rate on the basis of the comparative credit risk. By the by, no instructions and regulations regarding the disclosures of interest rate and the frequency level of compounding at which banks pay the interest to the depositor have totally been mentioned.

4. OBJECTIVES

The main objective of the study is to find out the disclosure of very important information such as interest rate provided to the different deposit scheme (i.e. Sinking Fund) along with the frequency of compounding bank apply for calculating the future sum of accumulated money and to compare whether any discrepancy prevails between the total returns provided by the banks for a given time period in accordance with the brochures, other documents etc and the total returns comes from the calculation of the basic financial management formulas. However, the other objectives are also as follows:

1- To find out the reason behind any discrepancy found from the calculation.
2- To find out the ways to overcome such discrepancies.

5. METHODOLOGY

The study is analytical in nature. Most of the data are taken from secondary sources. Among 52 commercial banks, 20 banks have been taken as sample. Printing materials, website of particulars banks, brochures and advertising materials have been analyzed in this study. Mainly different Deposit Scheme Plan in the name of Monthly Savings Scheme, Deposit Pension Plan, and Deposit Savings Scheme etc. of the sample banks are taken into consideration. Data of Millionaire Scheme as well as Billionaire Scheme of different sample banks are also viewed for getting insight into the topic. Mainly, most of the data presented and analyzed in that paper are from respective publicly available brochures of different banks. Besides, for analysis purpose, some undisclosed data were collected from the bank officials. The study presents some facts through descriptive statistics using percentages for analyzing how many banks are providing interest rate information as well as compounding frequency level information. Besides, to find out discrepancy level, the study used some manual calculations found through the basic compounding formula used in Financial Management. Spread Sheet was used for all calculation. The resulting facts then are presented through tabular presentations and findings are sorted out from those presentations.

6. DISCUSSION

6.1 BASIC IDEA

The necessity of sinking fund calculation for comparing the investment proposal is worth mentioning. The basic formula for any deposit scheme belongs to the basic sinking fund provision formula written in every financial management. The formula is as follows: ---

$$FVA = Installment \times FVIFA_{i/m,mn}$$

Where, FVA= Future Value of Annuity

i = Interest Rate (or Compounding Rate)

$FVIFA_{i/m,mn}$ = Future Value Interest Factor of Annuity for nth Period compounded in m times at i Interest rate and it is calculated as follows:-

$$FVIFA_{i/m,mn} = \dfrac{1}{\dfrac{i}{m}}\left\{\left(1+\dfrac{i}{m}\right)^{mn} - 1\right\}$$

This widely used formula is the basic for all types of calculation of Sinking Fund. An investor can save an equal amount each period specified by bank and can collect the sum-total with interest earned after the specified period. Equal installment is hereby treated as annuity in the finance literature. Whenever, any saver makes any deposit scheme, almost all of the banks require a first installment at the time of opening such DPS plan. So, the initial formula needs some extension due to the very fast installments and the formula is to be:

$$FVA = Installment \times FVIFA_{i/m,mn}\left(1+\dfrac{i}{m}\right)$$

The essential elements for utilizing the formula is that investor must know the installment amounts the bank requires to deposit, the value of i (i.e. interest rate), and the time in a year the bank provides interest to the account i.e. compounding frequency. Besides, if an investor wishes to accumulate a certain sum of money to create his own customized scheme through a given period of time at a specific rate, then the investor can find out the installment amount for this specific accumulation and make his own scheme.

The difficulty arose when banks compounded in different time period but takes the installment on monthly basis. To overcome such issues banks use an average amount from the entire installment collected within a compounding time period and then apply the formula for calculating the value of money. A more important aspect is that when installment and compounding frequency does not occur at the same frequency, effective interest rate must be used in the calculation.[3]

The essence of the discussion is that maximum banks do not disclose the important elements such as how much interest they provide for a specific savings scheme and surprisingly almost all of the banks do not mention how many times they provide interest to the savers. The lack of those elements seriously impedes the personal calculation by investors they could do for comparing with other alternatives and taking a better decision. The unavailability of such information extremely not only halts the better choice but also persuades in some cases to choose the erroneous investment. The succeeding part of the paper articulate ins and out regarding the matter and the pitfall of such practices.

6.2 DEPOSIT SCHEME

The discussion mainly relies on the following types of accounts banks are normally offering to people throughout the country. The study discusses under the three main headings:

- Deposit Scheme for Different level of Accumulation.
- Deposit Scheme for Millionaire
- Deposit Scheme for Kotipoti (Billionaire).

The purposes of all the schemes are the same that is to accumulate a certain sum of money for some equal payments. These types of accumulation are found in different names in different banks such as--Monthly Saving Deposit Scheme (MSDS), Deposit Plus Scheme, Monthly Savings Scheme, Monthly Savings Scheme, Education Saving Scheme (EDS), Smart Savers Scheme, Shanchay Prokolpo, Millionaire Scheme, and Kutipoti Scheme, etc.

7. ANALYSIS

This part of the paper first presents the different interest rate offered by different banks for the aforementioned scheme separately.

7.1 DISCLOSER OF INTEREST RATE

Only a few banks tell the interest rate for various levels of offerings of deposit scheme. Others conceal the rate which has been exposed through descriptive statistics throughout this paper. For various monthly deposit schemes, the disclosure percentage of interest rate scenario is presented below:

TABLE 1: INTEREST RATE DISCLOSING FOR SINKING FUND[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Interest Rate Mentioned	2	100.0	100.0	100.0

[a] Identity = Nationalized Bank

Source: Brochures of Nationalized Bank

Among four nationalized commercial banks two banks were taken into consideration regarding whether they mention interest rate in their brochures and it is found that all of them disclose the interest rate i.e. the investor can get the full disclosure of interest rate information from the nationalized commercial banks. As a result, any analysis for the investor creating sinking fund through nationalized commercial banks while they consider such rate as opportunity cost of capital becomes some what meaningful.

TABLE 2: INTEREST RATE[b]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Interest Rate Not Mentioned	12	80.0	80.0	80.0
	Interest Rate Mentioned	3	20.0	20.0	100.0
	Total	15	100.0	100.0	

[b] Identity = Private Commercial Bank

Source: Brochures of Banks

Browsing over of 15 private commercial banks' documentation such as brochures, website reveals that only three private commercial banks disclosed the interest rate of deposit savings scheme but remaining 12 among 15 i.e. 80% of the 100% selected sample did not disclose this vital information pertaining interest rate they consider in their proposal. This forces the investor into more confusion and even they may get lower return in comparison with the calculation found through the manual formula.

TABLE 3: INTEREST RATE [c]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Interest Rate Not Mentioned	1	33.3	33.3	33.3
	Interest Rate Mentioned	2	66.7	66.7	100.0
	Total	3	100.0	100.0	

© Identity = Islamic Bank

Source: Brochures of Banks

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[3] Whigham, David; Quantitative Business Methods Using Excel, Oxford University Press, 1998, P: 194

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The table tells that 66.7% Islamic Banks of sample taken clearly disclose the interest rate for various deposit schemes. Islamic banking must disclose the profit sharing ratio and hence the disclosure of estimated profit rate (i.e. estimated interest rate) should be publicly available automatically. So, this scenario can conclude that although disclosing the interest rate is vital, conventional private commercial banks are more prone not to disclose the interest rate in case of monthly deposit scheme.

7.2 DISCLOSER OF FREQUENCY OF COMPOUNDING

The most important fact is that all the banks did not disclose the compounding time period. Without the information of such kind, an analyst must be bamboozled in his or her analysis. The table below shows how compounding frequency can affect the effective interest rate:

TABLE 4: INTEREST RATE MOVEMENT WITH COMPOUNDING FREQUENCY

INTEREST RATE APPLICABLE FOR DIFFERENT COMPOUNDING PERIOD					
		Effective Yearly Rate* for Compounding by			
Name of the Banks	Interest Rate (%)	Monthly (%)	Quarterly (%)	Semiannually (%)	Annually (%)
Agrani Bank Ltd.	9%[†]	-	-	-	-
Sonali Bank	8%[†]	8.30%	8.24%	8.16%	8.00%
Bank Asia Ltd.	11.83%[††]	12.49%	12.37%	12.18%	11.83%
Dhaka Bank	11.83%[††]	12.49%	12.37%	12.18%	11.83%
Dutch Bangla Bank	10.5%[††]	11.02%	10.92%	10.78%	10.50%
IFIC Bank Ltd	-	-	-	-	-
Jamuna Bank Ltd.	12.49%[††]	13.23%	13.09%	12.88%	12.49%
Mercentile Bank Ltd.	11.83%[††]	12.49%	12.37%	12.18%	11.83%
Mutual Trust Bank	-	-	-	-	-
National Bank Ltd.	11.08%[††]	11.66%	11.55%	11.39%	11.08%
Premier Bank Ltd.	8.55%[††]	8.89%	8.83%	8.73%	8.55%
Prime Bank Ltd.	-	-	-	-	-
Southeast Bank Ltd	9.5%[††]	9.92%	9.84%	9.73%	9.50%
Trust Bank Ltd.	11.5%[††]	12.13%	12.01%	11.83%	11.50%
AB Bank	12.25%[†]	12.96%	12.82%	12.63%	12.25%
City Bank	10%[†]	10.47%	10.38%	10.25%	10.00%
Pubali Bank	12%[†]	12.68%	12.55%	12.36%	12.00%
Shahjalal Islami Bank Ltd.	12.75%[†]	13.52%	13.37%	13.16%	12.75%
Al-Arafah Islami Bank Ltd.	-	-	-	-	-

Source: (i) † Brochures of Respective Banks (ii) ††Calculated through the interest rate function given in Microsoft Excel (iii) *Effective rate through Spread Sheet

Table 4 depicts that at different compounding frequency level, effective interest rate changes. Different interest rates generate different maturity value discussed in the return comparison part of this section. So, an investor without the information of compounding frequency level can easily make wrong decision. For example, from the above table it can be said that in case of Mercentile Bank the annual rate is 11.83% and if the bank provides actually interest on quarterly basis, then effective interest rate the investor will earn from his investment is 12.37%. But the investor should have been earned 12.49 % effective interest because the investor provides monthly installment and utilizes monthly compounding frequency required to use in the basic sinking fund formula. Clearly, in that case an investor receives less income. Whatever, an investor even receiving fewer amounts from the sinking fund scheme can not claim to the authority. Bank officials orally give the information regarding compounding time period, though written documents in that case is very fruitful. This is the main pitfall created by all banks to bind the investor within a limit so that any investor or analyst can not challenge the banks later. In this study among 20 banks including Islamic bank and nationalized bank, no banks were found that they have provided the compounding time i.e. compounding frequencies in their information sources.

7.3 RETURN COMPARISON

Although interest rate and compounding time period are not found for many banks, the final maturity value and corresponding monthly installment have been used to find out the annual return. The function provided in Microsoft Excel i.e. ƒ Rate(Number of Period, Periodic Equal Payment, Present Value, Future Value, Type, Guess)[4] has been utilized in that purpose. The probable compounding period has been considered as monthly, quarterly, semi-annually and even yearly though annual interest payment is rare. The original calculation uses the formula given in discussion section and therefore the total return based on different compounding frequency is easily found manually. However, the following part of the paper addresses prospective maturity value for different compounding frequency level and at the same time compares those values with the original amount paid by different banks to verify any sort of discrepancies inherent to the offerings of banks.

7.3.1 IMPACT OF INTEREST RATE AND COMPOUNDING ON DIFFERENT DEPOSIT SCHEME

Most of the banks offer a wide range of deposit scheme ranging from one year to 10 years deposit scheme. For simplification, the data concerning for 10 year period for only Tk. 1000 monthly deposit for a future accumulated sum of money have been analyzed. The other periods with other amount are identical with the same analysis i.e. the interpretation will be the same as the undergoing interpretation of the analysis is.

The following tables compare different maturity values paid by different banks for different compounding frequencies for a monthly deposit of Tk. 1000 for the mentioned maturity period. At the same time, discrepancy column of tables determine whether the investor could get more or less if this compounding level along with the interest rate is used. The calculation in table 5 is based on different compounding frequency.

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[4]Whigham, David; Quantitative Business Methods Using Excel, Oxford University Press, 1998, P: 194

TABLE 5: MATURITY VALUE FOR DIFFERENT COMPOUNDING FREQUENCY

		RETURN COMPARISON THROUGH MATURITY VALUE CALCULATION BY				
	Yearly Interest Rate	Monthly Compounding	Quarterly Compounding	Semiannually Compounding	Annually Compounding	Actual Amount Paid by Bank[*]
Name of the Banks		TK.	TK.	TK.	TK.	TK.
Agrani Bank Ltd.	9%	-				-
Sonali Bank	8%	184165.68	183622.03	182837.40	181371.76	181371
Bank Asia Ltd.	11.83%	230001.53	228454.04	226253.69	222245.20	230000
Dhaka Bank	11.83%	230001.53	228454.04	226253.69	222245.20	230000
Dutch Bangla Bank	10.50%	212659.44	211547.66	209958.26	207036.48	212659
IFIC Bank Ltd	-	-	-	-	-	-
Jamuna Bank Ltd.	12.49%	239238.00	237431.91	234871.02	230227.17	239250
Mercentile Bank Ltd.	11.83%	230001.53	228454.04	226253.69	222245.20	230000
Mutual Trust Bank	-					-
National Bank LTd.	11.08%	220020.77	218732.11	216894.12	213528.51	220000
Premier Bank Ltd.	8.55%	190011.89	189367.16	188438.52	186709.78	190000
Prime Bank Ltd.	-	-	-	-	-	-
Trust Bank Ltd.	11.5%	225544.18	224114.95	222079.98	218364.32	224115
AB Bank	12.25%	235828.69	234120.16	231695.12	227290.20	231695
City Bank	10%	206552.02	205577.79	204182.27	201608.42	205568
Pubali Bank	12%	232339.08	230727.85	228438.52	224272.83	224273
Shahjalal Islami Bank Ltd.	12.75%	242998.23	241081.72	238367.28	233454.03	233000
Al-Arafah Islami Bank Ltd.	-	-	-	-	-	-

Source: Manual Calculation through Spread Sheet

The table 5 tells that among 14 banks whose maturity value from the brochures were available, only 7 banks compounded the installment monthly, 2 banks compounded quarterly, 1 bank semiannually and 4 banks annually. Due to these different compounding frequencies applied by different banks, the return also varies and therefore discrepancies prevail. Table 6depicts such discrepancy for different compounding frequency levels that may occur through a bank. For example, Bank Asia receives installment and provides interest on monthly basis. The calculated value from the basic sinking fund formula by an investor and the maturity value offered by bank become same and therefore an investor will not get any fewer amounts from his investment i.e. no discrepancy will follow. But if Bank Asia would have utilized quarterly or semi—annual compounding, then an investor would have been received 0.66% or 1.66% fewer returns from his or her savings from the sinking fund. In the same manner, table 6 shows that the banks that use monthly compounding frequency, investors face no discrepancies from their savings. In addition, an investor will receive 0.63% less return form his savings in Trust Bank Ltd. because this bank uses quarterly compounding instead of monthly compounding. Generally, a few banks uses monthly compounding, rather they use other compounding frequency whereas they are taking installment on monthly basis. If such practices are prevailing, it indicates that banks are providing fewer amounts from the accumulated fund. So, there is a deep pitfall for investors that could only be overcome through proper disclosures of interest rate and its respective compounding frequency.

TABLE 6: DISCREPANCY IN MATURITY VALUE OF TK. 1000 MONTHLY INSTALLMENT FOR DIFFERENT COMPOUNDING FREQUENCY

		DISCREPANCY* IN MATURITY VALUE FOR DIFFERENT COMPOUNDING FREQUENCY BY DIFFERENT BANKS				
Name of the Banks	Interest Rate	Compounding Frequency	Monthly Compounding	Quarterly Compounding	Semiannually Compounding	Annually Compounding
	(%)	(%)	(%)	(%)	(%)	(%)
Agrani Bank Ltd.	9%[†]	-	-			
Sonali Bank	8%[†]	Annually	-1.52%	-1.23%	-0.80%	0.00%
Bank Asia Ltd.	11.83%[‡]	Monthly	0.00%	0.68%	1.66%	3.49%
Dhaka Bank	11.83%[‡]	Monthly	0.00%	0.68%	1.66%	3.49%
Dutch Bangla Bank	10.5%[‡]	Monthly	0.00%	0.53%	1.29%	2.72%
IFIC Bank Ltd	-	-	-	-	-	-
Jamuna Bank Ltd.	12.49%[‡]	Monthly	0.00%	0.77%	1.86%	3.92%
Mercentile Bank Ltd.	11.83%[‡]	Monthly	0.00%	0.68%	1.66%	3.49%
Mutual Trust Bank	-	-	-	-	-	-
National Bank LTd.	11.08%[‡]	Monthly	0.00%	0.58%	1.43%	3.03%
Premier Bank Ltd.	8.55%[‡]	Monthly	0.00%	0.33%	0.83%	1.76%
Prime Bank Ltd.	-	-	-	-	-	-
Southeast Bank Ltd	9.5%[‡]	Annually	-1.01%	-0.81%	-0.53%	-0.02%
Trust Bank Ltd.	11.5%[‡]	Quarterly	-0.63%	0.00%	0.92%	2.63%
AB Bank	12.25%[†]	Semiannually	-1.75%	-1.04%	0.00%	1.94%
City Bank	10%[†]	Quarterly	-0.48%	0.00%	0.68%	1.96%
Pubali Bank	12%[†]	Annually	-3.47%	-2.80%	-1.82%	0.00%
Shahjalal Islami Bank Ltd.	12.75%[†]	Annually	-4.11%	-3.35%	-2.25%	-0.19%
Al-Arafah Islami Bank Ltd.	-	-	-	-	-	-

Source: (i) [†]Brochures of Respective Banks (ii) [‡]Calculated through the interest rate function given in Microsoft Excel (iii) * Manual Calculation through Spread Sheet by Using Data Found form Brochures

7.3.2 IMPACT OF INTEREST RATE AND COMPOUNDING ON DIFFERENT MILLIONAIRE SCHEME:
The same mechanism has been used in case of millionaire scheme. In millionaire scheme's documents, no bank provided the information of interest rate and compounding time. However, through the in-depth analysis of the brochures and other documents such as website, available printed materials, the following information concerning millionaire scheme of only six banks among the sample twenty banks were originated which have been presented below through different tables: ---

TABLE 7: INTEREST RATE WITH DIFFERENT COMPOUNDING FREQUENCY.

Name of Banks	INTEREST RATE FOR DIFFERENT COMPOUNDING FREQUENCY				
	Monthly Installment	Effective Rate for Monthly Compounding	Effective Rate for Quarterly Compounding	Effective Rate for Semiannual Compounding	Effective Rate for Annual Compounding
IFIC Bank Ltd	4850	10.44%	10.35%	10.22%	9.97%
Jamuna Bank Ltd.	4400	12.27%	12.15%	11.97%	11.63%
National Bank LTd.	4550	11.64%	11.53%	11.37%	11.06%
Prime Bank Ltd.	4570	11.56%	11.45%	11.29%	10.99%
Trust Bank Ltd.	4935	10.11%	10.03%	9.90%	9.67%
Al-Arafah Islami Bank Ltd.	4500	11.85%	11.73%	11.57%	11.25%

Source: Manual Calculation through Spread Sheet using the data found on Brochures

TABLE 8: DISCREPANCY IN MATURITY VALUE FOR DIFFERENT COMPOUNDING FREQUENCY

	DISCREPANCY IN MATURITY VALUE FOR DIFFERENT COMPOUNDING FREQUENCY BY DIFFERENT BANKS						
	Interest Rate	Monthly Installment	Compounding Frequency	Monthly	Quarterly	Semiannually	Annually
Name of Banks	(%)	Tk.	Time	(%)	Tk.	Tk.	(%)
IFIC Bank Ltd	9.97%	4850	Monthly	0.00%	0.47%	1.15%	2.43%
Jamuna Bank Ltd.	11.63%	4400	Monthly	0.00%	0.65%	1.59%	3.36%
National Bank LTd.	11.06%	4550	Monthly	0.00%	0.59%	1.44%	3.03%
Prime Bank Ltd.	10.99%	4570	Monthly	0.00%	0.56%	1.40%	2.97%
Trust Bank Ltd.	9.67%	4935	Monthly	0.00%	0.44%	1.08%	2.28%
Al-Arafah Islami Bank Ltd.	11.25%	4500	Monthly	0.00%	0.60%	1.48%	3.13%

Source: Manual Calculation through Spread Sheet using the data found on Brochures

Above tables depict different effective interest rate for different compounding frequencies (table 7) and the possible discrepancies (table 8) if the same compounding frequency with the frequency of installment a bank does not apply. Here it is found that under the consideration of underlying interest rate calculated (due to the unavailability of interest rate through banks' documents) through spread sheet, an investor may receives less return from the sinking fund. For example, in table 8, an investor investing into Jamuna Bank Ltd. would receive 0.65% to 3.36% fewer returns if Jamuna Bank did not use monthly compounding. Besides, surprisingly it is noticeable that for Tk. 1 million Jamuna Bank demands Tk. 4400 monthly installment for 10 years whereas Trust Bank demands Tk. 4935 monthly installment for the same period i.e. Tk. 535 more installment per month for the same level of return. This fact (depicted in table-9) under the heading of range undoubtedly proves that by not providing necessary information pertaining the interest rate and its' compounding nature etc. banks keep more options at their hand. So, eventually only the disclosures of such information can give the real picture of accumulation.

TABLE 9: DISCREPANCY IN INSTALLMENT

	N	Range	Minimum	Maximum
Installment	6	535.00	4400.00	4935.00
Valid N (list-wise)	6			

Source: Brochures of respective banks

7.3.3 IMPACT ON DIFFERENT KOTIPOTI (BILLIONAIRE) SCHEME:

Kotipoti scheme offered by various banks also does not provide interest rate information and its corresponding compounding frequency that are very much crucial for the calculative decision. The following table depicts again the effective earnings rate in the kotipoti scheme for different compounding frequencies:

TABLE 10: INTEREST RATE WITH DIFFERENT COMPOUNDING FREQUENCY

Name of the Banks	Interest Rate for Different Compounding Frequency				
	Interest Rate	Monthly Installment[*]	Effective Rate for Monthly Compounding	Effective Rate for Quarterly Compounding	Effective Rate for Semi-annual Compounding	Effective Rate for Annual Compounding
	(%)	TK.	(%)	(%)	(%)	(%)
Jamuna Bank Ltd.	11.63%	44010	12.26%	12.14%	11.96%	11.63%
Mutual Trust Bank	11.95%	43175	12.62%	12.49%	12.30%	11.95%
Trust Bank Ltd.	11.56%[*]	44510	12.19%	12.07%	11.89%	11.56%
Al-Arafah Islami Bank Ltd.	11.10%	45400	11.68%	11.57%	11.41%	11.10%

Source: Manual Calculation through Spread Sheet using the data found on Brochures

Here, it is again found that non-disclosures of related important facts fell the investor completely in vague situations and might provide them lower returns. For example, by creating Kotipoti Scheme in Mutual Trust Bank Ltd., an investor actually earns 12.62% (found from table 10), if the bank applies monthly compounding on the installment amount but this investor's earnings will be only 11.63% in case of annual compounding on the installment amount by the bank. From table 11, an investor investing into Trust Bank Ltd. receives up-to 0.74% less amount because this bank compounds the received amount of Kotipoti Scheme quarterly basis instead of monthly basis.

TABLE 11: DISCREPANCY IN MATURITY VALUE FOR DIFFERENT COMPOUNDING FREQUENCY

Name of the Banks	Discrepancy in Maturity Value for Different Compounding Frequency by Different Banks						
	Interest Rate	Monthly Installment	Compounding Frequency	Monthly	Quarterly	Semi Annually	Annually
	(%)	Tk.	Time	(%)	(%)	(%)	(%)
Jamuna Bank Ltd.	11.63%	44010	Monthly	0.00%	0.62%	1.57%	3.34%
Mutual Trust Bank	11.95%	43175	Monthly	0.00%	0.68%	1.68%	3.55%
Trust Bank Ltd.	11.56%*	44510	Quarterly	-0.74%	0.00%	0.82%	2.56%
Al-Arafah Islami Bank Ltd.	11.10%	45400	Monthly	0.00%	0.58%	1.44%	3.04%

Source: Manual Calculation through Spread Sheet using the data found on Brochures

Moreover, by means of such non-disclosure, different banks may even demand higher amount of installment for the Kotipoti Scheme i.e. give lower interest to the investor. For example, the amount ranging from Tk. 43175 to Tk. Tk. 45400 are received as installment by various banks and in return every bank provides Tk. 1 crore after 10 years.

TABLE 12: DISCREPANCY IN INSTALLMENT

	N	Range	Minimum	Maximum
Installment	4	2225.00	43175.00	45400.00
Valid N (list-wise)	4			

Source: Brochures of respective banks

This indicates that an investor can deposit Tk. 43175 in Mutual Trust Bank and can accumulate Tk. 1 crore after 10 years. At the same time this investor by not depositing Tk. 45400 in Al-Arafah Islami Bank Ltd. to accumulate Tk. 1 crore can save Tk. 2225 per month. If this investor creates another sinking fund even with Tk. 2000 monthly installment from this Tk. 2225, he or she can accumulate a hand some amount of extra money after the same maturity of 10 years that are presented in the following table:

TABLE 13: MATURITY VALUE FOR TK. 2000 MONTHLY INSTALLMENT FOR 10 YEARS

Name of Banks	Installment Amount	Maturity	Maturity Value
Dutch Bangla Bank Ltd.	2000	10 years	425318
Trust Bank Ltd.	2000	10 Years	448230
Jamuna Bank Ltd.	2000	10 Years	478550
National Bank Ltd.	2000	10 Years	440000
Bank Asia Ltd.	2000	10 Years	460000
Dhaka Bank Ltd.	2000	10 Years	460000

Source: Brochures of respective banks

How large the concealing fact it is? The underlying fact is that through choosing of banks rightly for the Kotipoti Scheme, an investor can accumulate Tk.1 crore as well as extra amount of more than Tk. 4 lakhs from the savings of installment. However, in many cases, for an investor it is not possible to detect the facts prevailing among various banks' offerings. This is only the interest rate and compounding frequency that can direct the investor to detect the facts and choose the right offer.

8. FINDINGS

Most of the banks do not disclose the interest rate used for compounding purpose in sinking fund proposal. Besides, no banks were prone to outlay the time period i.e. the compounding frequency they use for compounding purposes. This information is very much vital for any investor to analyze his or her investment decision in sinking fund that is worthy to mention. In addition, for a same level of return, the installment requirements differ immensely among banks. Due to this pitfall dominant in the banking sector of Bangladesh, banks also have the tendency to pay less amount of future accumulated sum of money to the investor who otherwise, if the information pertaining to the interest rate offered as well as actual compounding frequency would have been obtainable to them, could have overwhelmed the loss they are bound to bear now. As a result, sinking fund investor could plan their savings more efficiently. Not but not least, such type of information handiness would allow them to set their opportunity cost (or minimum required return standard) more prudently in analyzing the return of the other alternatives and thereby escaping from any pitfall manipulating them now and then in case of alternative investment evaluation.

9. RECOMMENDATIONS

[9.1] Bangladesh Bank as the bankers' of all banks in Bangladesh should concentrate on regulating the disclosure of all vital information by banks to all prospective sinking fund customers.

[9.2] All of the banks should provide information of interest rate for all types of deposit savings scheme.

[9.3] Disclosure of compounding frequency must be publicly available through written documents to be fair in paying the accumulated money from the savings scheme. It is the compounding frequency through the disclosure of which the prevailing and prospective discrepancy can be eliminated to the large extent.

[9.4] Hidden facts, containing different rate for different tenures, different slab for availing the accumulated sum of money from the sinking fund, practiced by each and every bank should clearly and elaborately be written so that any investor straightforwardly can take those facts into his or her consideration.

[9.5] In case of customized savings such as millionaire scheme, billionaire scheme, and monthly benefit scheme, central bank should closely monitor the disclosures of pertaining documentations to eliminate any obstacles making serious impact on investors of those types of schemes.

[9.6] Almost all banks create sinking funds in a customized format. Attention should be given on the creation of other types of sinking funds on the need basis of the customers.

10. CONCLUDING REMARKS

As far as disclosures of interest rate and compounding frequency are concerned, banks operating in our country can not undermine the needs of the disclosures of vital information that this study has brought into the focus. For the sustainable economy, the need for ethical banking practices is obligatory. Disclosure of all the requirements in case of receiving the interest from the loan creation, but at the same time no-disclosure of the facts inherent in different sinking fund provision can not be the good practices. Hence, proper disclosures practices of interest rate offering as well as compounding frequency including other hidden facts relating to the proposal of any saving scheme are earnestly expected. Finally, the establishment of better customer-bank relationship practices indispensible for long-run success both for customers and banks must grow by proper practices of the guidelines recommended in this paper.

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