International Journal of Economics, Commerce and Management
United Kingdom ISSN 2348 0386 Vol. 11, Issue 8, Aug 2023

https://ijecm.co.uk/

MEASURING THE EFFICIENCY OF NON- BANK FINANCIAL INSTITUTIONS THROUGH DATA ENVELOPMENT ANALYSIS: EVIDENCE FROM BANGLADESH

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Abstract

Non-bank financial institutions are the second largest pillar that perform intermediation role between surplus and deficit sectors of an economy. They are the second largest credit providers in industrial sectors of Bangladesh. Non-bank financial institutions (NBFIs) make up the gap between formal banking system and corporate sectors of Bangladesh economy. Main intention of the present study is to measure the efficiency of NBFIs in Bangladesh. For measuring the efficiency inputs and outputs are selected based on intermediation approach. Current study incorporates fourteen (14) NBFIs of Bangladesh that are purposively selected as sample along with six (6) years balance panel data (2016-2021) of them. Efficiency of sample NBFIs is computed by most popular non-parametric data envelopment analysis (DEA). Results unveil that mean efficiency score of selected NBFIs is 0.966 that means they are 96.6% efficient in terms of producing outputs at current level of inputs. Among sample NBFIs only 14% [2 NBFIs such as IPDC Bangladesh Limited (1.057) and LankaBangla Finance Limited (1.028)] are efficient Researcher estimated that inefficiency drive from wastage of inputs, managerial inefficiency and defective intermediation process. So, present study suggests that non-bank financial institutions should reduce the wastage of inputs, enhance the managerial proficiency & skill of the employees, design fintech based innovative financial products or services and increases the number of services in menu list for ensuring their efficiency.

Keywords: Efficiency, Technical Efficiency, Technological Efficiency, Non-bank financial institutions

INTRODUCTION

Economic growth and upliftment of developing countries highly relies on thriving and soundness of financial sector. Financial sector is the backbone of an economy. Financial sector encompasses Banks, non-bank financial institutions (leasing firms), insurance companies, credit unions, co-operative society, non-government organization microfinance institutions etc. Compare to any other financial institutions banks contribute more to uplift economy through mobilizing financial resources from surplus sector to deficit sector (Rahaman, M.M. et al, 2023). Besides the formal commercial banks non-bank financial institutions (NBFIs) especially leasing firms also play crucial role in an economy. Through non-bank financial institutions (leasing firms) initially ensure lending facilitates to deficit sectors but now they are able to collect term deposits from surplus sectors. Now a day's NBFIs offer different kinds of financial products and services that help to satisfy the expectations along with demands of clients which finally enable them to go on competitive in financial market. As like formal banking institutions NBFIs also provide start-up capital to small scale businessmen and women. As per Bangladesh Bank (BB) NBFIs are the second largest financial institutions that perform intermediary role in most of the countries in this world. NBFIs mainly facilitate investment along with merchant banking services. Instead of that bridge financing, portfolio management, issue manager, underwriting, corporate agent in amalgamation and acquisition, investment counseling etc. NBFIs are the second largest credit providers in corporate sector of Bangladesh (Bangladesh Bank, 2019). Through facilitating a large number of financial services, NBFIs play significant role to reconcile the financial channelization aperture between commercial banks together with the remaining units of the society (Shrestha, 2007; Sufian, 2008; Vittas, 1997). Regarding the NBFIs eagerness among investors has been increased because of that the growth along with the formation of a large number of NBFIs in Bangladesh in current time. Accordingly financial outcomes of this sector have been a considerable area of interest for shareholders nowadays. For ensuring the sustainability of intermediary role to reduce the gap between banking sector and deficit units of Bangladesh economy NBFIs must efficient at their operational level and services providing areas. Though a number of study have been undertaken by researchers to measure the efficiency **()** of banking industry in Bangladesh but there no significant research study to measure the efficiency of NBFIs especially leasing firm in Bangladesh. There are some studies **(**Rahman, M. M., et al, 2023 as well as Faisal and Rahman, 2020) on NBFIs where efficiency is measured through different ratios. So researcher conducts present study where efficiency of NBFIs is measured through DEA for make up the existing research gap.

Rational of the study

Sustainability of a country's economy highly relies on financial institutions, because they have capacity to channelize the society's idle fund into productive sectors of an economy. NBFIs especially leasing firms are now recognized a vital segment of financial system which is growing rapidly along with gaining renowned (Islam & Osman, 2011). During last few decades there have been remarkable changes in financial sector worldwide along with Bangladesh as consequence of technological progress, innovative financial instruments, fortification and swift financial deregulation. Beside the banking sector, NBFIs (leasing firms) are accredited as significant pillar of country's economic prosperity and help to afford the financial needs of deficit unity of society (Hossain & Shahiduzzaman, 2002). Recently a large number of privatized commercial banks are addressing in the field of non-bank financial institutions which increase the thread of survival of NBFIs in Bangladesh. As per Bangladesh Lease and Financing Companies Association (BLFCA, 2004) infringing the present banking regulations privatized commercial banks are participating in non-bank finance functions. Whereas NBFIs are not authorized to collect any sort of deposit that is reimbursed on claim via financial instruments (cheque & draft) as well as request of the savers. However, NBFIs are hardly authorized to call for a term deposit having minimum 3 months maturity or more, but these are not be in the hands of content of deposit insurance plan by central bank i.e. Bangladesh Bank. Furthermore, non-bank financial institutions do not have any approval to conduct with foreign exchange and gold. To contest with formal baking industry, the NBFIs must be efficient in terms of their operation which can be possible to maximize the outputs for given level of inputs or minimize the inputs for producing given level of outputs. It is also state that only worthwhile and efficient NBFIs have a scope to ensure marvelous performance as a consequence they able to achieve their objectives there by maximizing shareholders wealth. The present study of efficiency in non-bank financial institutions (leasing firms) is indispensible due to a number of reasons. Firstly, as financial institutions NBFIs (leasing firms) should be attained operational efficiency which helps them to survive in competitive market. Secondly, inefficient NBFIs are able to trace out their operational defects and take necessary actions to overcome it. Finally, it facilitates practitioner and policymakers to develop and implement policies.

Non-Bank Financial Institutions in Bangladesh

In Bangladesh, non-bank financial institutions besides the formal banking system play noteworthy contribution in the progress of economy. Bangladesh Bank is the regulator of non-bank financial institutions as like in formal banking system. Under, The Financial Institutions act, 1993 NBFIs get authorization from Bangladesh Bank for their activities Industrial Promotion and

Development Company of Bangladesh Ltd. (IPDC) was the introductory non-public section non-bank financial institution established in 1981. At present, there are 35 NBFIs in Bangladesh whom have 308 branches (Bangladesh Bank, 2022). Among the 35 NBFIs, nineteen (19) are private NBFIs, two (2) are fully state-owned & one (1) is the subsidiary of state owned commercial banks and remaining thirteen (13) are joint ventures with foreign involvement. Principle sources of gathering funds of NBFIs are Term Deposit (minimum three months), borrowing from commercial Banks as well as other Financial Institutions (Insurance Company and many more), securitization, bond along with Call Money are key source of funds for non-bank financial institutions as well as Bond and Securitization. Total asset of NBFIs at the end of June 2022 stood at BDT 973.24 billion. At the end of June 2022, total deposit of NBFIs stood at BDT 478.08 billion, Loan and lease is BDT 693.32 billion and total assets BDT 973.24 billion.

Table 1: Sample NBFIs in Bangladesh

Non-Bank Financial Institutions (Leasing firm)	Established	Stock Market enlistment
Bay Leasing & Investment Limited	May 25, 1996	2009
Delta Brac Housing Finance Corporation Ltd.	1996	2008
GSP Finance Company (Bangladesh) Limited	October 29, 1995	2012
IDLC Finance Limited	1985	1992
IPDC Bangladesh Limited	November 28, 1981	2006
LankaBangla Finance Limited	1997	2006
MIDAS Finance Limited	May 16, 1995	2002
National Housing Finance & Investments Ltd	August 1998	2009
Prime Finance & Investment Limited	March 1996	2005
Phoenix Finance & Investments Limited	April 19,1995	2007
Premier Leasing & Finance Ltd.	September 26, 2001	2005
Union Capital Limited	1998	2007
Uttara Finance and Investments Limited	May 7, 1995	1997
United Finance Ltd.	1989	1994

Source: Annual Reports of sample NBFIs

LITERATURE REVIEW

Literature review is considered as the heard of the research study because it helps researcher to find out the research gap as well as relevant methodology to fulfill this identified gap. So, to trace out the research gap following are some relevant literatures on present research topic.

Rashedul, H. M., & Israt, R. M. (2012) examined the banking sector efficiency of Bangladesh through data envelopment analysis. Researchers consider 24 commercial banks as a sample in this study including only one year data (2010). For measuring efficiency operational profit and operational income are outputs as well as cost, total assets & deposits are inputs. Researchers outlined that efficiency scores of sample commercial banks are range from 0.638 to 1. Abduh, M., et. al (2013) studied on efficiency & performance of 5 Shariah based commercial banks in Bangladesh for the period of 5 years from 2006 to 2010. In this study researchers measure the efficiency through data envelopment analysis where output is total income and input is total expenses. Researchers found that average efficiency scores of sample Islamic commercial banks are range from 0.962 to 1.219 over studied period. Ahmed and Liza (2013) assess the efficiency of 35 commercial banks in Bangladesh by employing the DEA for the period of 10 years from 2002 to 2011. Results revealed that efficiency scores of the 2nd and 3rd generation commercial banks as well as offshore commercialized banks are very much productive. Sample banks not only maintained good efficiency score just as well ensure the steadiness of efficiency in line over study tenure. Islam et al. (2013) employed DEA to investigate the impact of technical efficiency on the productivity magnification of Islamic banking industry in Bangladesh. Researchers considered deposits, overhead cost, total assets as inputs as well as investment and advances, return on investment, ROA as output for measuring the efficiency of sample Islamic banks in Bangladesh. The study outlined that except EXIM bank, IBBL, & SIBL remaining all are efficient under constant return scale as well as variable return to scale. For the time being, IBBL as well as SIBL are invariable productive on behalf of VRS but not on behalf of CRS at the time of studied tenure. Additionally, the EXIM bank has poor efficiency score on behalf of VRS along with CRS independently. Sufian, F., & Kamarudin, F. (2013) measure the profit efficiency of 31 commercial banks in Bangladesh through applying data envelopment analysis (DEA) for the periods of eight years from 2004 to 2011. Under intermediation approach researchers select deposits, labor and capital as inputs as well as loan and investment are outputs. Results revealed that on average sample commercials banks profit efficiency score is 92.9% in 2004 and 82.4% in 2011 which indicates that studied commercial banks lost scope to drive 7.1 percent as well as 17.6 percent more profit from the existing volume of inputs throughout the years 2004–2009. Idris (2014) applied non-parametric DEA to explore the technical, pure technical along with scale efficiency of Shariah based commercial banks working in Bangladesh. Data were examined in two separate parts in view of divergent inputs and outputs. Results in 1st steps shown that average technical efficiency score of all Shariah based banks were near to frontier such as 98%, 96%, 98% as well as 96% in 2010, 2011, 2012, and 2013 individually. Second part results outlined, all of the Shariah complaint banks were technically efficient in most of the study tenure; except in 2012, SIBL, AAIBL together with ICB Islamic banks were perceived to be managerially (technically) inefficient. Faisal (2014) measure the technical, allocative plus economic efficiencies of leasing companies in Bangladesh in his PhD dissertation through employing data envelopment analysis for 6 years periods from 2006 to 2011. This study shown that efficiency scores of sample leasing firms fluctuate between 0.66 and 1 within study period. Jahan, N. (2019) examine the productivity of 29 commercial banks registered in Dhaka stock exchange by using the Malmquist productivity index. The study covers five years secondary data from 2011 to 2015. Under intermediation approach researchers considers number of staff, deposits, interest expense, as well as non-interest expense are inputs on other hand net loans, net interest income along with non-interest income are outputs. Result of this study shown that Shariah compliance banks had proportionately higher 5 years aggregate mean TFP change index compared to that of traditional banks. Productivity analysis designates that improvement made in TFP was principally imputed to the soar in efficiency change in lieu of technological advancement. Faisal and Rahman (2020) examined the technical efficiency of 17 leasing firms in Bangladesh through DEA under constant return to scale. Researchers found that mean technical efficiency scores for all the firms are under 0.80. Chaity, N. S., & Islam, K. Z. (2022) studied on bank efficiency together with practice of earning management of 22 DSE listed non-public commercial banks in Bangladesh. It covers 10 years secondary data from 2007 to 2016. Researchers employed data envelopment analysis for measuring the efficiency of studied private commercial banks in Bangladesh. Results revealed that average efficiency scores of sample private commercial banks is 80.84% over the study period. Rahman, M. M., et al (2023) studied on efficiency determinants of 15 Bangladeshi non-bank financial institutions. In this study researchers compute the efficiency score of non-bank financial institutions through cost to income ratio for the period of 5 years from 2016 to 2020. Result revealed that numbers of branch, number of employees, firm size along with deposit ratios are the statistically significant determinants of efficiency of non-bank financial institutions.

The above documentations precisely outline following research gaps. First, the most of the above studies have focused on the banking industry of Bangladesh due to widespread functioning of commercial banks. Second, there are studies where efficiency is measured by cost to income ratio or expense to revenue ratio of non-bank financial institutions in Bangladesh. Third, to the best of researcher knowledge, empirical evidence on the efficiency through DEA of the Bangladesh non-bank financial institutions is entirely missing in the literature. So based on above knowledge gaps, the current study tries to facilitate new experimental proof on the efficiency of the Bangladesh non-bank financial institutions (leasing firm).

METHODOLOGY

Methodology is the scientific process of systematically solving the research problem. In present study stock market listed (23) non-bank financial institutions (NBFIs) are population from where fourteen (14) NBFIs purposively selected as sample. This study incorporates six (6) years balance panel data (2016-2021).

Inputs & outputs selection

To measure the efficiency through DEA appropriate outputs and inputs must be selected. For choosing the inputs and outputs in financial institutions there are three approaches specifically, production, intermediation along with value added approaches (Frexias & Rochet, 1997; Sealey & Lindley, 1977). The intermediation approach, is the suitable technique among researchers employing the DEA method to compute the efficiency score of financial sectors (leasing firms) in developing countries (e.g., Bader et al., 2008; Sufian, Kamarudin, & Noor, 2012; Sufian, Muhamad, Ariffin, Yahya, & Kamarudin, 2012). The intermediation approach deems non-bank financial institutions (leasing firms) as financial mediators. Under the intermediation technique, the prime role of NBFIs (leasing firms) is to acquire surplus funds from depositors as well as and transfer them into loans for earning profit (Chu & Lim, 1998).

For this study researcher considers gross loan portfolio, investment portfolio, and interest & non-interest revenue as outputs as well as deposits, interest expenses and operating expenses as inputs.

Efficiency measurement tools

There are two frontier analysis tools to measure the efficiency of financial institutions namely parametric and non-parametric approaches (Berger & Humphrey, 1997). Researcher employs non-parametric DEA for measuring the efficiency of non-bank financial institutions (leasing firms) in Bangladesh. In this study DEA is applied as efficiency measurement tools due to a number of reasons such as firstly DEA facilitates an individual efficiency score for each decision making units which permits ranking among sample DMUs. Secondly, DEA results help to focus on the areas of upliftment for each particular DMU like under manufactured outputs or unnecessarily utilized inputs. Thirdly, a number of studies recommended that for measuring efficiency through DEA functional relationship among variables are not required (e.g., Bauer, Berger, Ferrier, & Humphrey, 1998; Evanoff & Israelvich, 1991; Grifell-Tatje & Lovell, 1997). Lastly, in smaller sample size DEA serves as appropriate method of assessing efficiency.

ANALYSIS AND DISCUSSION

Table 2: Efficiency scores of sample NBFs in Bangladesh (2016-2021)

NBFs (Leasing firm)	Technical efficiency	Technological efficiency	Pure technical efficiency	Scale efficiency	Efficiency
Bay Leasing & Investment Limited	0.895	0.926	0.910	0.983	0.829
Delta Brac Housing Finance Corporation Ltd.	0.967	0.909	1.005	0.962	0.878
GSP Finance Company (Bangladesh) Limited	0.992	0.914	1.000	0.992	0.906
IDLC Finance Limited	1.021	0.953	1.001	1.020	0.973
IPDC Bangladesh Limited	1.042	1.015	1.026	1.016	1.057
LankaBangla Finance Limited	1.045	0.983	1.014	1.030	1.028
MIDAS Finance Limited	0.998	0.948	1.000	0.998	0.946
National Housing Finance & Investments Ltd	1.000	0.950	1.000	1.000	0.950
Prime Finance & Investment Limited	1.000	0.930	1.000	1.000	0.930
Phoenix Finance & Investments Limited	1.003	0.987	1.000	1.003	0.989
Premier Leasing & Finance Ltd.	0.982	0.927	0.982	1.000	0.911
Union Capital Limited	0.975	0.917	0.964	1.011	0.894
Uttara Finance and Investments Limited	0.975	0.966	0.975	1.000	0.942
United Finance Ltd.	1.000	0.966	1.000	1.000	0.966
Average	0.992	0.950	1.000	1.000	0.966

Source: Researcher own estimation through DEA

Above table outlines the efficiency scores of sample (NBFIs) Non-Bank Financial Institutions (Leasing & Investment Firms) in Bangladesh for the study period of 6 years from 2016 to 2021. Results revealed that average efficiency score NBFIs is 0.966 which indicates sample NBFIs are 96.6% efficient in terms of producing outputs (Gross Loan portfolio, Investment Portfolio and interest & non-interest income) at current level of inputs (Deposits, Financial expense, Operating expenses). Efficiency scores focuses on increasing outputs 3.4% at existing level of inputs. It is also remarked that only IPDC Bangladesh Limited and LankaBangla Finance Limited are efficient having efficiency score 1.057 and 1.028 respectively.

Bay Leasing & Investment Limited holds lower efficiency score 0.829 which means it has a score to increase 17.1% outputs at present volume of inputs. IPDC Bangladesh Limited have highest efficiency score 1.057 that refers it produces 5.7% more outputs at it available inputs. Efficiency is decomposed into technical efficiency and technological efficiency. Mean technical efficiency score of sample NBFIs is 0.992 where top score is 1.045 (LankaBangla Finance Limited) and lowest score is 0.895 (Bay Leasing & Investment Limited). Among the sample NBFIs 50% (7) are technically efficient having efficiency scores from 1.000 to 1.045. Researcher estimates that remain NBFIs should uplift their technical efficiency score from 0.8% to 10.5% at their current level of inputs. Technical efficiency is the compound of pure technical efficiency together with scale efficiency. From 14 NBFIs 11 (78.60%) are pure technically efficient which means respective firms are managerial proficient to utilize their inputs for producing outputs. In terms of scale efficiency 10 (72%) out of 14 NBFIs are efficient that indicates that most of the sample firms are able to operate their operation at optimal level. Moreover it is noticed that only IPDC Bangladesh Limited (1.015) is technologically efficient while remaining are inefficient. Mean technological efficiency score is 0.950 which denotes sample NBFIs have an opportunity to enhance their outputs at 5% in existing level of inputs.

POLICY IMPLICATIONS

The current findings shall be helpful to stakeholders of non-bank financial institutions in Bangladesh such as owners, managers, top executives, financial professionals, government, policymakers, researchers and academicians. Present study guides common stockholders, top executives and manager to develop right policy for increasing the efficiency of NBFIs in terms of utilizing inputs and producing outputs. Besides this, competent authorities of NBFIs take appropriate action whether they have to reduce inputs or maximize outputs. This study explores the new insight in non bank financial sector through measuring efficiency with the help of data envelopment analysis (DEA) where multiple inputs (deposits, interest expenses and operating expenses) and outputs (gross loan portfolio, investment portfolio, and interest & non-interest revenue) are simultaneously considered. The findings shall help government and Bangladesh Bank to formulate various fruitful policies for non-bank financial institutions in Bangladesh.

CONCLUSION

Non-bank financial institutions are significantly contributed to economy development of Bangladesh through fulfilling the gap of formal banking system. Bangladesh Bank (BB) informed that, NBFIs are the second largest financial institutions that duly perform financial intermediary role in Bangladesh. Mainly NBFIs provide financing facilitate to industrial sector in Bangladesh.

Though lease financing is the principle business of NBFIs but they also provide venture capital financing, real estate financing, term lending, merchant banking, as well as equity financing. Currently, private commercial banks are addressing in the area of non-bank financial institutions that increase the thread of survival of NBFIs in Bangladesh. In that circumstance, to compete with private commercial banks, the NBFIs should be efficient in the context of their operation. For this reason, the focusing issue of the present study is to measure the efficiency of NBFIs in Bangladesh. To measure the efficiency of NBFIs gross loan portfolio, investment portfolio, and interest & non-interest revenue as outputs as well as deposits, interest expenses and operating expenses as inputs. Data envelopment analysis is applied for measuring the efficiency. Fourteen (14) NBFIs purposively selected as sample. This study includes six (6) years balance panel data (2016-2021). Results reveals that average efficiency score of sample NBFIs is 0.966 which indicates sample NBFIs are 96.6% efficient in terms of producing outputs (Gross Loan portfolio, Investment Portfolio and interest & non-interest income) at current level of inputs (Deposits, Financial expense, Operating expenses). Efficiency scores focuses on increasing outputs 3.4% at existing level of inputs. Among sample NBFIs only 14% [2 NBFIs such as IPDC Bangladesh Limited (1.057) and LankaBangla Finance Limited (1.028)] are efficient and remaining 86% (12) are inefficient. Researcher estimated that inefficiency drive from wastage of inputs, managerial inefficiency and defective intermediation process. Efficiency is segregated into technical efficiency and technological efficiency. Mean technical efficiency score of sample NBFIs is 0.992 where 50% (7) NBFIs are technically efficient having efficiency scores from 1.000 to 1.045. Average technological efficiency score of studied NBFIs is 0.950 where IPDC Bangladesh Limited (1.015) is technologically efficient. Researcher suggests that non-bank financial institutions in Bangladesh must the follow the policy, procedure and other intermediation issues of benchmark non-bank financial institution IPDC Bangladesh Limited because it is efficient in all dimensions of the efficiency. So, this study recommend that non-bank financial institutions should reduce the wastage of inputs, enhance the managerial proficiency & skill of the employees, design fintech based innovative financial products or services, increases the number of services in menu list, reduce the operating costs and ensure optimal utilization of limited financial resources to produce the maximum outputs.

FURTHER STUDIES

Present study only incorporates 14 NBFIs in Bangladesh. In future, any researcher may incorporate more NBFIs in Bangladesh. Besides this future study can be determined the determinants of efficiency of NBFIs in Bangladesh. Current study measures efficiency based on variable return to scale which later any one done by constant return to scale.

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