Review

Efficiency of the banking sector in Sudan: A review paper

Mai Mahmoud Abdo
School of Management Studies, University of Khartoum, Sudan.

Received 2 September, 2017; Accepted 5 February, 2018

This paper aims to review published research studies on efficiency performance of the banking sector in Sudan. The methodology in the reviewed articles can be grouped into two categories. The first category employs the non-parametric data envelopment analysis (DEA) while the second category uses the parametric stochastic frontier analysis (SFA). The findings in the reviewed articles reveal that, although the efficiency performance of banks operating in Sudan had improved through time, the overall performance of the banking sector remains inefficient. The main source of inefficiency is managerial inefficiency, which is lack of optimum allocation of financial resources as evidenced in scale inefficiency, arising from increasing return to scale. Another source of inefficiency indicated in these studies is allocative inefficiency arising from sub-optimum mix of inputs. This latter inefficiency implies that the banks in Sudan are not keen to adopt cost minimizing approaches.

Key words: Efficiency, data envelopment analysis (DEA), stochastic frontier analysis (SFA), banks, Sudan.

INTRODUCTION

The banking sector plays an important role in the development of economic and social welfare. Beside its role in international trade facilitation, it also mobilizes savings and utilizes them in productive investment opportunities. This role is considered as necessity given the economic resources scarcity.

Islamic banks on their part as financial intermediaries aim to source and deploy funds through lawful and Shariah compliance means, that include exchange-based, equity-based and service based contracts. The Islamic banking sector in Sudan emerged in 1984 when the central bank of Sudan issued regulations to all banks prohibiting interest-based transactions, and initiated the utilization of Islamic finance instruments, derived from sources of Islamic principles, that is, the Quran, sunnah, as well as the consensus of opinions of Muslim scholars.

The banking sector in Sudan undertakes a vital role in the economy given the absence of a well-functioning and efficient financial market. Therefore, efficient and effective utilization of resources is very important to Sudanese banks. In addition, the increasing competition and technological innovation bring even greater emphasis to minimizing waste and inefficiencies to ensure survival and soundness of banks.

Efficiency of banks can be measured as how optimal the bank is in transforming inputs into outputs. In relation to resource allocation efficiency, there are two categories, internal efficiency and a locative efficiency. Internal
efficiency refers to effective management within the firm. While a locative efficiency relates to the most efficient allocation of scarce resources in order to produce maximum level of output. Technical efficiency is the effectiveness with which a given set of inputs is used to produce an output, it is necessary for allocative efficiency to be achieved.

The inputs variables of a bank may include staff costs, deposits and costs of premises, while net income and investment accounts represent the outputs. According to Berger and Humphrey (1992) there are two different views on the determination of input and output variables, the intermediation approach and the production approach. The intermediation approach considers banks as using deposits together with physical inputs to produce various types of bank assets as measured by their value. Total cost is defined as the interest expense of deposits plus the expense of physical inputs. The production approach, on the other hand, views banks as using only physical inputs, such as labor and capital to produce deposits and other types of bank assets. Moreover, this approach defines the total cost as the cost of purchased inputs only. The main difference between the two approaches lies on how deposits are treated. Although, the intermediation approach considers deposits as an input to the production of loans, the production approach treats deposits as an output since deposits significantly contributes to the creation of profits. Furthermore, the two approaches adopt different definition of cost. The intermediation approach takes into account both operating and financial costs, while the production approach considers only operating cost. Although, there is no perfect approach, the intermediation approach may be more appropriate to evaluate financial institutions since this approach takes into account financial expenses, which often accounts for one-half to two-third of total cost of these institutions.

There are different analytical tools used in the literature to assess banks efficiency, the most important methods are the Data Envelopment Analysis (DEA), and the Stochastic Frontier Approach (SFA). DEA is a non-parametric technique that seeks to project the inefficient decision making unit onto the most efficient frontier of the decision making units in the sample. In contrast, the SFA specifies a functional form for the cost, profit, or the production frontier and allows for a random error, which includes the inefficiencies and a random component.

This paper aims to review published research papers on the efficiency of the banking sector in Sudan.

LITERATURE REVIEW

A number of studies have been conducted on efficiency of Sudanese banking sector. These studies employed different statistical techniques to measure the efficiency and also utilized different sample periods and different sample sizes.

Al Tom (2015) examined the efficiency of commercial banks in Sudan during the period of 2012 to 2013, using DEA approach. Inputs include the total assets, expenses and deposits, while outputs included profit, loans and investments. Also, the paper investigates the determinants of banks’ efficiency. The findings of the paper reveal that in 2013 out of 36 banks, 9 satisfied scale and pure technical efficiency, and 7 are only scale efficient. 27 banks are technical inefficient, which implies managerial inefficiency, and 4 exhibit decreasing return to scale (DRT), while the remaining 23 banks show increasing return to scale (IRT). According to the paper in 2012, out of 31 banks, 7 are scale and pure efficient, 4 banks sustained their efficiency from 2012 to 2013 which are: Alsalam Bank, Family bank, Blue Nile Mashreq Bank, and Industrial Development Bank. Five banks are scale efficient while pure technical in efficient.

Regarding the determinants of efficiency, the findings show positive relation between return on assets and loans to total assets ratio, and banks’ efficiency. However, the effect of the bank size fluctuates between years. That is, in 2013, it had a positive effect on efficiency while in 2012, it had a negative effect.

Onour and Abdalla (2011) employed DEA methodology using the intermediation approach to measure efficiency performance of Islamic banks in Sudan. They used data from 12 Islamic banks annual reports during the sample period of 2007-2008. The input variables include salaries and wages, and deposits, while the output variables include loans and net incomes. The efficiency performance of Sudanese banks in the sample indicate the largest bank in the group, Omdurman National Bank (ONB) and middle sized; Blue Nile Mashriq Bank (BNMB) are the only two banks that performed scale and pure technical efficiency scores. The smallest bank in the group, which is Islamic Cooperative Development Bank (ICDB), scored pure technical efficiency level, even though it is scale inefficient. Only ONB remained unchanged in its efficiency status for both periods. For all other banks, their efficiency status improved in 2008. These results imply, since ONB is the only government owned and the largest bank in the group in terms of deposit and loan sizes, and BNMB and ICDB are private sector owned banks, bank size and ownership are not important factors for managerial efficiency (pure technical efficiency) performance.

Ali and Mahran (2011) examined the efficiency of Sudanese banks under the intermediation and production approaches using the Stochastic Frontier method, and panel data for 16 banks during the period of 1996-2004. The output variable consists of total investment variable. The inputs category consists of, the wage variable, the total deposits variable, both in foreign and local currency; fixed assets variable. The results under both approaches
indicate that Sudanese banks are inefficient. Nonetheless, specialized and joint venture banks are relatively less inefficient than commercial and government banks, respectively. Most importantly, although majority of the Sudanese banks operate under increasing returns to scale, these banks suffer from diseconomies of scale and have not yet exploited the advantages of increasing returns to scale, as shown in the very low estimates of overall average cost efficiency. The Workers National Bank was shown as the most efficient commercial bank with a cost efficiency score of 0.95, while Bank of Khartoum is the most inefficient bank.

Hussein (2003) employed the stochastic frontier analysis and intermediation approach. The author estimated the operational efficiency in 17 Sudanese Islamic banks, during the period of 1990 to 2000. The inputs constitute total costs, which includes both financial and operating cost. Financial cost is defined as total distributed profits to depositors, while three output variables are included: investment in Murabaha, investment in other Islamic modes of finance (such as leasing, musharaka, istsina’a), and off-balance sheet transactions. The findings of the study show that Islamic banks do not create inefficiency per se. Furthermore, although the average efficiency is almost stable during the study period (1990 – 2000), there are wide efficiency differences across Sudanese banks. All Sudanese banks witnessed a change in the operational efficiency. The efficiency has improved only in 7 banks out of 17. Despite the small size of the foreign banks, they are more efficient than state-owned and joint-ownership banks. In addition, Sudanese banks are not ready yet to face the globalization challenges.

Elzahi et al. (2003) investigated the technical and allocative efficiency (X-efficiency) of 12 Sudanese banks. The study used the Stochastic Frontier analysis (SFA), employing the intermediation approach. The sample period covers 10 years, from 1989 to 1998. This period was chosen because it represents the transformation of the conventional Sudanese banks into fully-fledged Islamic banks. During the period of the study, all Sudanese banks practiced only equity financing, as a result, the only output available was investments. While labor, fixed assets and deposits are factor inputs. The empirical results tend to suggest that banks under investigation show low levels of X-efficiency. That is to say, on average, Sudanese banks did not make use of potential efficiency opportunities. The estimated technical efficiency (TE) was only 86%, implying that the Islamic banks were not using cost saving techniques. On the other hand, the allocative efficiency was 91% which means that the Sudanese Islamic banks were 10% allocative inefficient. This implies that the Sudanese Islamic banks might not have allocated their inputs in optimum levels. Therefore, the inefficiency in the Sudanese Islamic banks could be more associated with inputs wasting (technical inefficiency) rather than choosing the incorrect input combinations (allocative inefficiency). This technical inefficiency occurred due to the over-utilization of physical inputs and deposits and the under-utilization of labor. On the other hand, the allocative inefficiency could be due to internal factors, such as lack of management expertise, as well as external factors, such as the economic sanctions that were imposed during the nineties on Sudan.

The analysis

The papers reviewed in this article adopted two approaches, the DEA and the SFA models. Specifically, Al Tom (2015) and Onour and Abdalla (2011) applied DEA analysis. While Hussein (2003), Elzahi et al (2003) and Ali and Mahran (2011) used SFA approach. All these studies applied the intermediation approach, except Ali and Mahran (2011) who applied both the production and intermediation approaches. The intermediation approach, is on line with the principles of the Islamic financial system, because Islamic banks act as financial intermediaries using the funds provided by the shareholders, depositors and investment account holders for financing, trading and investment purposes. Also, staff and fixed assets, are used to produce the outputs which are, the financing (such as murabahah and ijarah financing) and other earnings assets.

Generally, in their findings, all the studies agreed on the inefficiency of the Sudanese banking sector in different time periods and different samples. During the period of 2007-2008, only two banks were efficient, that is achieved both pure and scale efficiency, which are Omdurman National Bank and Blue Nile Mashriq Bank, while in 2012-2013 period, the number of efficient banks increased to seven banks in 2012, and nine banks in 2013. Although, all Sudanese banks witnessed change in their operational efficiency between 1990-2000, the efficiency scores improved only in 7 banks out of 17, and none of the banks were efficient. During the period of 1994-2004, the results indicate that Sudanese banks were inefficient, as the highest efficiency score was 0.95 achieved by the Workers National Bank. Banks in the sample during the period of 1989 to 1998 had low levels of X-efficiency, that is, on average, the Sudanese Islamic banks technical efficiency (TE) was only 86%, while the allocative efficiency was 91%.

In fact, comparing the above results across different periods, it appears that Sudanese banks’ efficiency improved over time from no efficient bank during the early periods of 1989-1998, 1990-2000 and 1994-2004 to two banks in 2007-2008 and seven and nine banks in 2012 and 2013, respectively. But on average, the banking sector in Sudan remains inefficient.

For those studies, which addressed the impact of
ownership type on efficiency performance, their results were inconsistent, as some argued that ownership do not affect efficiency scores, this is evidenced by Onour and Abdalla (2011) findings, which revealed that among the efficient banks in the sample, there are private as well as government owned banks. Also, Al-Tom (2015) study revealed similar results. In contrast, Ali and Mahran (2011) showed that ownership has impact on efficiency, specifically, they concluded that specialized and joint venture banks are relatively less inefficient than commercial and government banks, respectively. In addition, Hussien (2003) found that foreign banks, are more efficient than state-owned and joint-ownership banks.

With regards to the size effect, Onour and Abdalla (2011) showed that, size of the bank is not related to efficiency performance since large as well as middle size banks both achieved high efficiency scores, while, Al-Tom (2015) concluded that the size effect is not stable over time.

Regarding the sources of inefficiencies, Elzahi et al. (2003) indicated that, the inefficiency in the Sudanese Islamic banks could be more associated with inputs wasting (technical inefficiency) rather than choosing the incorrect input combinations (allocative inefficiency). This technical inefficiency occurred due to the over-utilization of physical inputs and deposits and the under-utilization of labor. On the other hand, allocative inefficiency could be due to internal factors, such as lack of managerial expertise as well as external factors, such as the economic sanctions that were imposed on Sudan. Al Tom (2015) and Ali and Mahran (2011) found that majority of the Sudanese banks operate under increasing returns to scale (IRS). Despite these results, these banks suffer from diseconomies of scale and have not yet exploited the advantages of increasing returns to scale, as indicated by the very low estimates of overall average cost efficiency.

CONCLUSION

The findings of the studies reviewed in this paper, can be grouped into two categories: the group of the papers that employed the DEA approach, and the group of papers that used the SFA approach. Since these two methodologies are different in their underlying assumptions, and DEA is non-parametric, while SFA is parametric, certainly, it is expect that these two approaches complement each other, implying that having similar results by the two approaches consolidate the final conclusion stated in this review paper.

The findings of the DEA models indicate that the major source of technical inefficiency of Islamic banks operating in Sudan for the past ten years is managerial inefficiency that lack optimum allocation of financial resources as evidenced in scale inefficiency, mainly due to increasing return to scale. The finding of the SFA models also support the evidence of allocative inefficiency due to sub-optimum mix of inputs, implying that the Islamic banks in Sudan were not keen to adopt cost minimizing approaches. The allocative inefficiency evidence featured in the banking sector of Sudan could be due to internal factors such as lack of management expertise as well as external factors, such as the economic sanctions that have been imposed for the past two decade.

The findings of the various studies reviewed in this research showed that there is improvement in the efficiency of the banking sector in Sudan as reflected in the increasing number of efficient banks from non-efficient in the early studies to about nine efficient banks in the study by Al Tom (2015). The results also indicate that, the effect of the ownership type and bank size on efficiency performance of the banks was not agreed upon.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

REFERENCES