

# Are Small Finance Banks in India Scale Efficient? A DEA Approach

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## Abstract

This paper is an attempt to examine the scale efficiency and its determinants of small finance banks in India operating in the country since 2017. Since these banks are set up with an objective of financial inclusion by spread of banking services to the hitherto neglected and unbanked regions of the country, their healthy performance is crucial. The 21<sup>st</sup> Century shifted attention to efficiency analysis of productive units as a measure of performance. The present study uses non parametric Data Envelopment Analysis (DEA) technique to assess efficiency. The study found further possibilities of improvements in scale efficiency of banks. Besides, most of the banks are found to be performing at sub optimally large scale which therefore requires these banks to scale down their operation. Further, (Credit to Deposit) CD ratio, financial inclusion, and inflation were found to be the major drivers of scale efficiency of these banks. The study provides appropriate recommendations based on these findings.

**Keywords:** Small Finance Banks, Scale Efficiency, Financial Inclusion, Most Productive Scale Size, Data Envelopment Analysis (DEA)

**JEL Classification:** G2, G20, G21, J3

## Introduction

The Indian banking sector has undergone many major transformations since independence in 1947. The sector is characterised by numerous reformatory measures with the ultimate objective to build up an efficient, resilient, and vibrant banking system. To cite some of these measures, liberalisation of the sector by creating a level playing ground for both public and private sector banks to operate,

granting autonomy to the banks by reducing the pre-emptions, allowing banks to raise equity from the market, introducing prudential norms for asset classification and income recognition, etc. Besides, there have been structural reforms from time to time in the form of entry of new players with distinct objectives and features, mergers, and acquisition, etc. However, a landmark development in the sector is the financial inclusion drive initiated so as to bring about inclusive growth and development in the country. Like many countries of the world financial inclusion is considered crucial for India owing to mass exclusion of the population from formal financial services and in this direction banks are considered to be the major catalyst to bring about financial inclusion. The country embarked upon rigorous financial inclusive drive mainly in 2005 when the Reserve Bank of India (RBI) highlighted its significance in its annual policy statement in 2005–2006. Thereafter, banks and other agents were directed to initiate the financial inclusion drive and the most remarkable one so far in this regard is the Prime Minister Jan Dhan Yojana – a central government scheme of the country towards financial inclusion with an objective to provide basic banking services such as bank account, remittances, credit, and insurance, etc., to the excluded mass of population. Another significant effort in this direction is the introduction of ‘Small Finance Banks’ in India in 2015 with an objective to serve the specific requirements of the underprivileged and niche customers not covered by other banks and other formal financial institutions. These banks are expected to make significant contribution towards financial inclusion, entrepreneurship and rural development and removing regional imbalances. Such banks are statutorily required to have 25 per cent of their branches in unbanked areas. As the name suggests these banks are required to perform at a smaller scale and are therefore devoid of lending to big corporates and to

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act as a banking correspondent. The minimum paid up capital for such banks is set at rupees 100 crores. Such banks are subject to pre-emptive requirements in the form of Cash Reserve Ratio (CRR), the Statutory Liquidity Ratio (SLR) and a minimum capital adequacy norm. Though such banks bear significant potentiality towards building up a stronger banking sector in particular and sustainable economic development in general, it is however, important to gauge the performance of these banks. Thus, the present study is an effort in this direction to assess the efficiency as well as the major drivers of efficiency of small finance banks operating in the country. The non-parametric Data Envelopment Analysis (DEA) is used to assess the bank's level of scale efficiency at the first stage, and at the second stage, the efficiency scores are regressed over certain bank specific and external variables using Tobit regression to identify the major drivers of scale efficiency. Studying scale efficiency in the context of Small Finance Bank in India is important as it would help managers and policy makers identify the right

scale, i.e., the right quantity of input and output for a bank. The study, in the first place examines the scale efficiency of banks and then regress the scale efficiency of banks over certain independent variables to identify the major drivers of efficiency. The rest of the paper is arranged as follows: Section 1 presents a brief profile of the Small Finance Banks in India, Section 2 presents review of related literature, Section 3 describes the methodology of the study and Section 4 presents the results of the analysis and recommendation along with a conclusion.

### Brief Profile of Small Finance Banks in India

Table 1 presents a brief profile of the Small Finance Banks in India with their year of formation along with their erstwhile names. Historically, these small finance banks functioned either as microfinance institutions (in NBFC form), co-operative banks, or local area banks. In 2017 the RBI issued banking license to these institutions to commence operation as small finance banks.

**Table 1: Profile of Small Finance Banks**

Name of the Bank	Year of Inception	Erstwhile Name/Promoted by
AU Small Finance Bank Ltd.	2017	AU Financiers India Ltd.
Capital Small Finance Bank Ltd.	2016	Capital Local Area Bank
Fincare Small Finance Bank Ltd.	2017	Disha Microfinance Pvt. Ltd.
Equitas Small Finance Bank Ltd.	2016	Equitas Holdings Pvt Ltd.
ESAF Small Finance Bank Ltd.	2017	ESAF Microfinance and Investments Pvt. Ltd.
Suryoday Small Finance Bank Ltd.	2017	Suryoday Microfinance Pvt Ltd.
Ujjivan Small Finance Bank Ltd.	2017	Ujjivan Financial Services Pvt Ltd.
Utkarsh Small Finance Bank Ltd.	2017	Utkarsh Microfinance Pvt Ltd.
North East Small Finance Bank Ltd.	2017	RGVN North East Microfinance Ltd.
Jana Lakshmi Small Finance Bank Ltd.	2018	Janalakshmi Financial Services Pvt Ltd.
Shivalik Small Finance Bank Ltd.**	2021	Shivalik Mercantile Co-operative Bank Ltd.
Unity Small Finance Bank**	2021	Centrum Financial Services Limited and BharatPe

Source: RBI Trend and Progress of Banking in India.

Note: \*\* not included in the present study.

### Key Performance Indicators of Small Finance Banks in India (2020-2021)

Table 2 presents the key performance ratios of the Small Finance Banks during 2019-2020 to 2020-2021. With regards to Credit plus Investment to Deposit ratio all the banks display decline in the ratio from 2020 to 2021 except Utkarsh Small Finance Bank Ltd. In case of Net

Interest Income to Total Assets ratio except ESAF Small Finance Bank Ltd. and Suryoday Small Finance Bank Ltd. all banks exhibited decline from 2020 to 2021. In case of Return on Assets (ROA) the trend is mixed where some banks reflect growth while others reflect decline in this ratio. However, in most cases, there is a significant rise in the ratio of NPA to Net Advances Ratio which can be taken as an early signal of financial impairment.

**Table 2: Key Performance Ratios of Small Finance Banks**

Name of the Bank	Credit + Investment to Deposit Ratio		Net Interest Income to Total Assets Ratio		Return on Assets		NPA to Net Advances Ratio	
	2020	2021	2020	2021	2020	2021	2020	2021
AU Small Finance Bank Ltd.	143.94	126.25	5.11	5.05	1.81	2.50	0.81	2.18
Capital Small Finance Bank Ltd.	98.06	94.60	3.58	3.39	0.51	0.69	1.25	1.13
Fincare Small Finance Bank Ltd.	148.96	125.39	8.53	8.17	1.38	1.65	1.67	1.58
Equitas Small Finance Bank Ltd.	117.83	112.23	9.59	8.45	2.24	0.95	0.64	3.88
ESAF Small Finance Bank Ltd.	125.11	123.73	8.70	9.29	2.44	1.44	0.41	2.80
Suryoday Small Finance Bank Ltd.	130.61	131.68	7.15	7.60	0.26	0.52	1.41	5.33
Ujjivan Small Finance Bank Ltd.	191.14	154.11	8.16	8.10	0.65	0.32	1.20	6.81
Utkarsh Small Finance Bank Ltd.	152.35	179.88	10.75	6.80	2.49	0.19	0.57	4.73
North East Small Finance Bank Ltd.	152.50	129.50	10.16	8.91	2.21	0.04	0.20	2.93
Jana Lakshmi Small Finance Bank Ltd.	142.76	140.27	9.31	7.79	2.47	1.04	0.18	1.33

Source: RBI Statistical Tables Relating to Banks in India (www.rbi.org).

## Review of Literature

Naceur, Khedhiri and Casu (2009) using DEA meta frontier evaluated bank efficiency in four MENA countries, viz; Egypt, Jordan, Morocco, and Tunisia, and studied the impact of financial sector reforms on the efficiency scores. The results revealed that Morocco and Tunisia outperformed Egypt and Jordan. Differences in technology significantly explained efficiency. Sathye (2002) examined the efficiency of banks in India and compared the same between public, private, and foreign banks. The mean efficiency score of Indian banks was found to be compatible with that of world mean efficiency score. The comparative results revealed that private sector banks accounted for lower efficiency scores than that of public and foreign banks. Tacles and Tabak (2010) evaluated efficiency of Brazilian banking sector over the post privatisation era. A study revealed larger banks to be relatively cost and profit efficient. Further, foreign banks reflected superior performance. The study further identified a positive impact of capitalisation on efficiency. Titus and Akinlo (2021) examined the cost efficiency of 15 commercial banks in Nigeria in the post consolidation era. The study identified cost inefficiency to the extent of 22 per cent. Further, bank size did not impact cost efficiency, and loan to deposit ratio was found to be a major driver of cost efficiency. Ray and Das (2010) examined the profit efficiency of Indian commercial banks and found state owned banks to be more efficient than the private counterparts. Further, bank size, ownership, and product mix were found to be the major drivers of

efficiency. Bhatia and Mahendu (2018) examined revenue efficiency of scheduled commercial banks in India. Study identified superior results in case of foreign banks in terms of scale efficiency. Ram Mohon and Ray (2004) compared the Indian public and private sector banks based on the results of productivity. The results revealed no significant difference between the productivity of the two categories of banks as out of the four comparisons no difference was found in three cases. Hernandez, Palazzo and Fernandiz (2019) performed a two-stage analysis to assess efficiency in the LatAm banking industries using conventional DEA and conditional efficiency technique. Study revealed heterogeneous scores of efficiency scores. Findings supported the earlier studies that reported the superior performance of banks in Chile, Brazil, Colombia, and Mexico. Further variables beyond managerial control had greater impact on efficiency. Bank size, Ratio of loan to assets showed a positive impact on efficiency while NPA ratio reflected a negative impact on efficiency.

Based on the review of literature the following hypotheses are framed:

H<sub>01</sub>: Bank size has significant positive impact on the efficiency scores of the banks.

H<sub>02</sub>: Credit to Deposit ratio has a significant positive impact on the efficiency scores of banks.

H<sub>03</sub>: Diversification of sources of income of banks has a significant positive impact on efficiency scores of banks.

H<sub>04</sub>: Inflation has a significant negative impact on the efficiency scores of banks.

$H_{05}$ : Financial inclusion has a significant positive impact on the efficiency scores of banks.

## Methodology

The 20<sup>th</sup> century experienced the development of holistic methodologies to assess the efficiency of financial economic units (Koopman, 1951; Debreu, 1951; Ferrel, 1957). The whole lot of literature available that attempt to measure the performance of banks can be divided into two categories based on the methodologies adopted, viz., traditional measures and frontier approaches. The techniques used in the traditional approach are Ratio Analysis, Regression Analysis, Index Number Approach, Taxonomic Method, Multivariate Analysis, Translog Function, etc. Traditionally accounting-based cost ratios are used by bank analysts to measure cost efficiency. A variety of such ratios covering different aspects of banking operations are computed and analysed to apprehend the level of performance. Although cost ratios are easy to construct and use, they are often difficult to interpret and may prove to be misleading. An alternative to accounting-based efficiency ratios is the Cost Frontier Analysis (CFA). In CFA, the analysts attempt to estimate the maximum amount that a bank can reduce its costs while still producing the same amount and combination of financial services. Frontier inefficiency, also known as X-inefficiency, implies the scope of cost savings. Under frontier approach several parametric and non-parametric techniques are developed to assess such levels of efficiency/inefficiency.

- Parametric Approach: (1) Stochastic Frontier Analysis (SFA), (2) Thick Frontier Approach (TFA), and (3) Distribution Free Hull (DFH).
- Non-Parametric Approach: (1) Data Envelopment Analysis (DEA).

The present study uses the non-parametric DEA technique to assess the efficiency of the banks under study.

## Data Envelopment Analysis

Analysis of the production possibilities of micro units remained one of the areas of common interest among researchers. This specific area of research gained further popularity after the publication of a seminal paper by Charnes, Cooper, and Rhodes (CCR) in 1978 using

the DEA model. The increasing popular use of the technique to estimate efficiency scores was further extended by Banker, Charnes and Cooper in 1984. A key inspiration of CCR paper was from Michael James Farrell (1957). Farrell's efficiency analyses were in the nature of parametric frontier functions, being restricted to single output while CCR enabled linking of linear programming to non-parametric specifications of production possibilities.

DEA is a linear programming-based technique to measure the performance efficiency of organisational units like banks known as Decision Making Unit (DMU) relative to other DMUs. The performance of DMUs is assessed in DEA using the concept of efficiency or productivity which is the ratio of weighted outputs (virtual outputs) to weighted inputs (virtual inputs). The best performing DMU is assigned an efficiency score of unity (or 100 per cent) and thus the performance of a DMU varies between 0 and 1.

The operating units of banks have multiple inputs such as staff size, salaries and hours of operation, advertising budget as well as multiple outputs such as profit, market share and growth rate. In this situation, it is often difficult for a manager to determine which operating units are inefficient in converting their multiple inputs into multiple outputs. This problem is addressed by DEA. At the same time, DEA also assigns a unique set of weights to each DMU. The weights for a DMU are determined using mathematical programming, as that weight which maximises its efficiency subject to the condition that the efficiencies of other DMUs is restricted to values between 0 and 1.

The DEA approach forms the efficiency frontier out of piecewise linear stretches, thereby forming a convex production possibility set. The firms on the frontier are considered 100 per cent efficient. The efficiency frontier envelops the available data. In the DEA frontier, efficient observations are those for which no other DMUs have as much or more of every output or as little of every input. Those DMUs forming the efficiency reference set are known as the peer group for the inefficient units. When the inefficient units are projected onto the envelopment surface, the efficient units closest to the projection and whose linear combination comprises this virtual unit form the peer group for that particular DMU.

### Estimation of Efficiency

The study uses the non-parametric DEA technique to estimate the Technical Efficiency (TE) and Scale Efficiency (SE) of the banks. Estimation of efficiency requires specification of input and output. Towards this end, there are two major approaches to the selection of inputs and outputs for banks. The first is the Production approach and the second is the Intermediation approach.

The difference between the two rests on how Deposit is treated. Production approach considers banks to be producing Deposits and accordingly treats it as an Output. Whereas in an Intermediation approach banks are considered to be an intermediary who takes Deposit from public and produces output and thus Deposits are considered as input in this case. The present study uses the Intermediation approach. Table 3 specifies the selected Inputs and Outputs along with their descriptive statistics:

**Table 3: Descriptive Statistics of Input and Output of Banks**

Inputs					Outputs				
	Mean (Rs. 'Cr)	SD	Max (Rs. 'Cr)	Min (Rs. 'Cr)		Mean (Rs. 'Cr)	SD	Max (Rs. 'Cr)	Min (Rs. 'Cr)
Deposit	1575.967	1169.959	4950.052	271.0046	Advances	8894.16	7672.755	34608.91	1348.282
Fixed Assets	221.49	273.284	1451.547	17.96307	Interest Income	170.5789	134.8215	482.3685	13.5407
					Non- Interest Income	8007.019	7499.536	35979.31	749.52

N = 33, Year 2018-2021.

Source: Author's Own Computation based on RBI data (Statistical Tables Relating to Banks in India, www.rbi.org).

### The DEA Model for Estimation of TE

The technical efficiency of a firm is defined as the ability to produce the maximum output with set level of inputs (output oriented TE) or the ability to produce the targeted level of output with the minimum level of inputs (input oriented TE). The potentiality of input reduction or output expansion represents a firm level of technical inefficiency.

Let x and y be the input and output bundles of the firms, respectively. The production technology can thus be defined as:

$$T - [(x, y): y \text{ can be produced from } x, x \geq 0; y \geq 0] \quad (1)$$

The output oriented TE of the firm producing  $y^0$  from input bundle  $x^0$  is represented as:

$$TE = \frac{1}{\varphi^*}$$

Where

$$\varphi^* = \max \varphi$$

$$\text{s.t. } \sum_{j=1}^N \lambda_j y^j \geq \varphi y^0;$$

$$\sum_{j=1}^N \lambda_j x^j \leq x^0$$

$$\sum_{j=1}^N \lambda_j = 1;$$

$$\lambda_j \geq 0; (j = 1, 2, \dots, N); \varphi \text{ unrestricted}$$

### The DEA Model for Estimation of SE

A firm is considered to be scale efficient if it is able to maximise productivity. A firm may be technically efficient but may still have the scope to maximise productivity. It is thus important to know the levels of input-output that maximise productivity. The scale efficiency of a firm is the ratio of TE under Constant Return to Scale (CRS) assumption and TE under Variable Return to Scale (VRS) assumption.

Once TE=1 is attained it is important to identify the level of input ( $x^*$ ) for which productivity is maximum. Average Productivity (AP) is represented by:

$$AP_0 = \frac{y_0}{x_0} \quad (2)$$



Bank	TE				SE			
	2018	2019	2020	2021	2018	2019	2020	2021
Ujjivan Small Finance Bank Limited	1	0.850	0.983	0.863	1	0.850	0.983	0.863
Utkarsh Small Finance Bank Limited	0.797	0.732	0.850	0.844	0.843437	0.834	0.880	0.875
<b>Mean</b>	<b>0.896</b>	<b>0.740</b>	<b>0.890</b>	<b>0.844</b>	<b>0.864</b>	<b>0.817</b>	<b>0.950</b>	<b>0.909</b>

Source: Author's Own Computation based on RBI data (Statistical Tables Relating to Banks in India, www.rbi.org).

To assess the correlation between TE and SE the Kerl-Pearson coefficient of correlation is calculated and the results are presented in Table 5. It can be seen that there exists positive correlation between TE and SE through out the years.

**Table 5: Coefficient of Correlation between TE and SE Scores**

Year	Coefficient of Correlation (r)
2018	0.927
2019	0.455
2020	0.491

Year	Coefficient of Correlation (r)
2021	0.550

Source: Author's Own Computation.

### Most Productive Scale Size (MPSS)

Table 6 depicts the results of MPSS. The alpha ( $\alpha$ ) and Beta ( $\beta$ ) values are computed. The ratio of  $\alpha$  to  $\beta$  is also computed. It can be seen that for most of the years for majority of the banks the ratio of  $\alpha$  to  $\beta$  is more than 1 indicating that the banks are mostly operating at a sub optimal or inefficient scale.

**Table 6: Most Productive Scale Size (MPSS) Banks 2018-2021**

Year	Bank	$\alpha$	$\beta$	$\alpha/\beta$
2018	Au Small Finance Bank Limited	0.098	0.095	1.032
	Capital Small Finance Bank Limited	0.853	0.263	3.243
	Equitas Small Finance Bank Limited	0.158	0.134	1.179
	Suryoday Small Finance Bank Limited	1.000	1.000	1.000
	Ujjivan Small Finance Bank Limited	1.000	1.000	1.000
	Utkarsh Small Finance Bank Limited	0.508	0.342	1.485
2019	AU Small Finance Bank Limited	0.117	0.082	1.427
	Capital Small Finance Bank Limited	1.031	0.435	2.370
	Equitas Small Finance Bank Limited	0.231	0.177	1.305
	ESAF Small Finance Bank Limited	0.514	0.369	1.393
	Suryoday Small Finance Bank Limited	1.000	1.000	1.000
	Ujjivan Small Finance Bank Limited	0.254	0.216	1.176
Utkarsh Small Finance Bank Limited	0.574	0.420	1.367	
2020	AU Small Finance Bank Limited	0.121	0.102	1.186
	Capital Small Finance Bank Limited	0.637	0.353	1.805
	Equitas Small Finance Bank Limited	0.159	0.152	1.046
	ESAF Small Finance Bank Limited	0.396	0.286	1.385
	Fincare Small Finance Bank Limited	1.000	1.000	1.000
	Jana Small Finance Bank Limited	1.000	1.000	1.000
	North East Small Finance Bank Limited	1.000	1.000	1.000
	Suryoday Small Finance Bank Limited	1.000	1.000	1.000
	Ujjivan Small Finance Bank Limited	0.135	0.133	1.015
Utkarsh Small Finance Bank Limited	0.269	0.229	1.175	

Year	Bank	$\alpha$	$\beta$	$\alpha/\beta$
2021	AU Small Finance Bank Limited	1	1	1.000
	Capital Small Finance Bank Limited	0.733793	0.420	1.747
	Equitas Small Finance Bank Limited	0.254361	0.227	1.121
	ESAF Small Finance Bank Limited	0.331628	0.252	1.316
	Fincare Small Finance Bank Limited	1	1	1.000
	Jana Small Finance Bank Limited	0.193698	0.162	1.196
	North East Small Finance Bank Limited	1	1	1.000
	Suryoday Small Finance Bank Limited	1	1	1.000
	Ujjivan Small Finance Bank Limited	0.20324	0.181	1.123
	Utkarsh Small Finance Bank Limited	0.278178	0.242	1.149

Source: Author’s Own Calculation.

It is now of interest to assess whether the banks are operating at a larger or smaller scale than the desired scale of operation. Accordingly, the firms are classified as the ones operating at a scale which is sub-optimally large, sub-optimally small, MPSS and ambiguous categories. This result is reported in Table 5. Banks classified as LARGE require scaling down its input-output bundle so as to reach the optimal scale whereas bank classified

as SMALL is required to scale up its operation to reach the optimum scale of operation. MPSS represents banks operating at the right scale. Banks classified as ambiguous refer to case where the bank either has to reduce input and increase output or increase input and reduce output. Table 7 shows that most of the banks are operating at larger scale than the efficient scale.

**Table 7: Scale of Operation of Banks**

Bank	Scale of Operation			
	2018	2019	2020	2021
AU Small Finance Bank Limited	LARGE	LARGE	LARGE	MPSS
Capital Small Finance Bank Limited	LARGE	AMBIGUOUS	LARGE	LARGE
Equitas Small Finance Bank Limited	LARGE	LARGE	LARGE	LARGE
ESAF Small Finance Bank Limited	NA	LARGE	LARGE	LARGE
Fincare Small Finance Bank Limited	NA	NA	MPSS	MPSS
Jana Small Finance Bank Limited	NA	NA	MPSS	LARGE
North East Small Finance Bank Limited	NA	NA	SMALL	MPSS
Suryoday Small Finance Bank Limited	SMALL	MPSS	SMALL	SMALL
Ujjivan Small Finance Bank Limited	MPSS	LARGE	LARGE	LARGE
Utkarsh Small Finance Bank Limited	LARGE	LARGE	LARGE	LARGE

Source: Author’s Own Computation.

### Determinants of Scale Efficiency

The efficiency scores, as obtained under SE, are regressed over the relevant explanatory variables. Since the SE score lies in the interval 0 and 1, the dependent variable is ‘a limited dependent variable’. Therefore, it is appropriate to use the Tobit model, which is a censored regression model, applicable in cases where the dependent variable is constrained in some way. The Tobit model may be defined as:

$$y^*; 0 \leq y^* \leq 1$$

$$y = 0; y^* < 0;$$

$$1; 1 < y^*$$

$$y^* = \beta x_i + \epsilon_t$$

Where y is the DEA SE score.  $\epsilon_t \sim i e N(0, \sigma^2)$

$y^*$  is a latent (unobservable) variable.

$\beta$  is the vector of unknown parameters that determines the

relationship between the independent variables and the latent variable.  $\xi$  is the vector of explanatory variables.

The Dependent and Explanatory Variables are presented in Table 8.

**Table 8: Dependent and Explanatory Variables**

<i>Dependent Variable: Scale Efficiency Scores under Output Oriented VRS Model</i>				
<i>Explanatory Variables</i>				
<i>Variables</i>	<i>Measurement</i>	<i>Representation</i>	<i>Variables Used by Authors in Previous Studies</i>	<i>Source</i>
Size	Log of Total Assets	SZ	Steven and Toni (2020), Hernandez, Palazzo and Fernandiz (2019), Das and Ghosh (2009), Blaskson et al (2022)	RBI
Credit Deposit Ratio	Credit to Deposit	CDR	Steven and Toni (2020), Palazzo and Fernandiz (2019), Das and Ghosh (2009)	RBI
Diversification	Net Interest Margin to Total Income	DIVR	Wu et al (2020), Nguyen (2018), Harimaya and Ozaki (2021)	RBI
Inflation	Inflation Rate	IFR	Hernandez, Palazzo and Fernandiz (2019), Adjei-Frimpong et al (2014); Chan and Karim (2010)	www.macrotrends.net
Financial Inclusion	Financial Inclusion Index	FII	Le, Chuc and Hesary (2019), Alshehadeh, Refae and Qasim (2020)	RBI

Source: Author’s Own Construction based on Review of Literature.

### Results of Tobit Regression

The Results of Tobit regression are reported in Table 9. It can be seen that CDR i.e. Credit to Deposit ratio has a significant impact on a bank’s scale efficiency. The Coefficient is found to be positive. One per cent increase in CDR causes Scale Efficiency rise of .22 per cent. Besides, Inflation rate is found to be positively associated with scale efficiency. The p value is significant. One per cent rise in inflation rate increases the scale efficiency of banks by .43 per cent. The plausible explanation may be that with the growth in inflation the demand for bank loan curtails, this may force the banks to scale down their operation and reach the optimum scale. Also, inflationary situations may allow these small banks to ‘plug the holes’ and scale up their operation and reach the optimum level (in case when the firm is operating at sub optimally small scale). This paradoxical finding is in line with earlier study by Hernandez, Palazzo, and Fernandiz (2019), Adjei-Frimpong et al. (2014); Chan and Karim (2010), who also discover a positive relation between inflation and efficiency. The p-value of FII, i.e., Financial Inclusion Index, is found to be significant. One unit rise in financial inclusion index causes a rise in SE by 0.02 per cent. Since small savings banks are specially designed banks to meet the banking requirements of the underprivileged section

of the society, thus financial inclusion drive facilitates the functioning of these banks in an efficient manner. Other variables are found to be statistically insignificant.

**Table 9: Result of Tobit Regression**

<i>Variables</i>	<i>Coefficient</i>	<i>P Value</i>
SZ	-0.1683261	0.300
CDR	0.2226774	0.003 *
DIVR	-5.61e-06	0.881
IFR	0.438612	0.065**
FII	0.0183873	0.083**
Constant	0.1658162	0.825
LR chi2 (5) =21.91		
Prob>chi2= 0.0005		
Pseudo R2= -3.8063		
N= 33		

Source: Author’s Own Computation using STATA-13.

Note: \*= significant at 5%, \*\*= significant at 10%,\*.

### Recommendations

It has been seen from the analysis that most of the small savings banks display potentiality of improvement in scale efficiency. There also exists the need to re-adjust the scale of operation of the banks as in most of the cases these

banks are found to be operating at a larger scale than the efficient scale. Thus, the banks are required to downscale their operation and choose smaller input-output bundles. This is also required in line of the purpose for which these banks are set. Unlike large commercial banks small savings banks are required to cater to smaller financial requirements and therefore the loan amounts are smaller and there exist restrictions on the volume of advances. The analysis also reveals that credit deposit ratio is positively related to scale efficiency. Thus, efficient credit management is required to elevate the CD ratio. . At this place, it is also important to note the fact that such banks also face competition from the professionally managed and experienced commercial banks and microfinance institutions who also have specially designed small products to cater to the requirements of the small and unbanked customers. Thus, there exists the need to professionally upgrade the loan management procedure as well as development of specially designed financial products distinct from the commercial banking products in order to gain a greater market share in the small banking business. Financial inclusion is positively associated with efficiency. Thus, financial inclusion drives at the macro level positively impacts the efficiency of these banks. Though financial inclusion is a cause as well as an effect of efficiency, the simultaneous relationship is however not examined here which may be dealt in future studies.

## Conclusion

Changes and innovations are often made in the financial system, considering the diverse financial and economic requirements of a nation. Considering the importance of catering to the unique financial needs of niche as well as neglected segments of the people residing in unbanked areas, small finance banks were introduced in India. The objective is to help with the process of financial inclusion and promotion of small and medium enterprises. However, it is imperative to ensure that such banks remain healthy and efficient. At this juncture, an analysis of their performance would provide signal about future prospects and possible impairments likely to be faced by these banks in the future. The present study takes up this matter of investigating the efficiency of small finance banks operating in the country since 2017. The analysis at the initial stage of operation of such banks reveals that there exists possibility of improving efficiencies (TE and SE) of

the banks. Most of the banks are required to readjust their scale of operation to reach the Most Productive Scale Size (MPSS). In the majority of cases, the banks are operating at a larger scale than the efficient scale. Thus, there is a need to scale down their operation to reach the optimal point. Further, the evaluation of factors affecting scale efficiency of banks indicates that Credit to Deposit ratio, Financial Inclusion Index and Inflation is positively associated with scale efficiency of banks. Based on the results, the study recommends the need for efficient deposit mobilisation and credit allocation to elevate the CD ratio. Financial inclusion is a means as well as end towards efficiency of small finance banks. Increased financial inclusion brings greater volume of business for these banks in one hand and the spread of banking services by these banks itself bring financial inclusion on the other hand. Thus, a financial inclusion drive is a precondition to ascertain sustainability of these banks. Appropriate strategies are required to be framed at the bank level during inflationary conditions as inflation positively impacts efficiency of these banks. Small finance banks are expected to emerge as specialised banks in the direction of rural financial intermediation and the integration of the rural economy with that of the nation.

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