Measuring Efficiency of Banks in Fiji

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Abstract

Commercial banks serve as intermediaries between savers and investors. They accept deposits from the public and hold them in trust. Under a fractional reserve system, commercial banks have been empowered to step up money supply by creating demand deposits when they approve loans to the borrowers. The efficiency of the banks is influenced by various factors. They include efficient loan recovery and keeping operating expenditure to a minimum as far as possible. Utilizing the data series on Fiji's commercial banks operations, which are now made available in the public domain on a quarterly basis from 2002 onwards, this paper seeks to measure the efficiency of banks in terms of profit as a ratio of operating expenditure and builds up a time series over a period of 15 years.

Introduction

Commercial banks mobilize savings and provide credit to aspiring investors. In Fiji, the role of commercial banks as an intermediary between savers and investors has been growing in importance over the years. Bank credit as a proportion of total domestic credit to economic agents has increased from 37.92% in 2000 to 118.84% of GDP in 2015 (WDI, 2017). Increase in credit growth has negative sides too. If banks were inefficient and the loan recovery processes were poor, it would impose heavy costs on the economy. The failure of a commercial bank in the public sector, National Bank of Fiji (NBF) placed heavy costs on the tax payers, estimated to be around F$200 million (Grynberg, Munro and White, 2002). The NBF case is also a good example of how a bank could abuse people's trust and potentially deprive them of their lives' savings. The NBF is a showcase of inefficiency all around, including sanctioning

loans without careful appraisal of projects, loans extended to friends and relatives of directors, high officials in the government and politicians - popularly known as crony capitalism - and high operating costs. These led to massive losses and falling efficiency. In this context, measurement of efficiency of banks over time become important not only for bank managers and but also for the central bank, which is, inter alia, the regulator of commercial banks.

This paper attempts to measure efficiency of banking operations. Ideally, the value of the paper would have been enhanced if data of individual banks were made available. In the absence of such data, our research is confined to using consolidated data for the banking system made available from 2002. Though the analysis is confined to a short period (2002-2015), the effort is a pioneering one, which is likely to be of considerable value to policy makers as well as depositors as well.

Fiji's Financial Sector

Fiji's financial sector comprised six commercial banks, five of which are foreign-owned and one domestically owned; four credit institutions; two life insurance companies, seven general insurance companies; and two unit trusts. Table 1 provides basic financial data on the financial sector of Fiji. Table 2 shows the total gross assets of the financial sector by each of its components.

Total assets of financial sector rose from F$ 6.1 billion in 2002 to F$ 16.4 billion in 2015. In 2015, at 53%, the banking sector held the majority of the total assets of the financial sector; this was followed by the state owned Fiji National Provident Fund (FNPF) and insurance sector at 32 percent and 8.8 percent respectively.

Measures of Efficiency

Traditionally a bank's performance has been evaluated by universal commercial sector indicators such as efficiency ratio, return on assets, and return on equity, and a specific banking sector indicator, net-interest margin. We, however, measure bank performance by the ratio of operating expenses to the sum of total net income (net interest income plus non-interest income, including income from fees and other charges). The numerator of the formula looks at overhead expenses such as human resource costs (salaries & benefits), rental costs, office supplies and utility costs. The denominator looks at the income generated from the bank's assets (Koch and McDonald, 2010).

Table 1: Licensed Financial Institutions in Fiji: Number

Institutiuons	Av. (2002-2005)	Av. (2006-2009)	2010	2011	2012	2013	2014	2015
Com Banks	6	6	5	4	5	5	6	6
Credit Inst	3	3	3	3	3	3	3	4
Life Insurance	2	2	2	2	2	2	2	2
Gen Insurance	8	8	8	8	8	7	7	7
Ins Brokers	4	5	4	4	4	4	4	4
Ins. Agents	326	355	329	357	312	334	404	498
FX Dealers	8	8	8	8	8	8	9	9
Money Changers	4	3	3	3	2	2	2	2
Securities Ex	0	1	1	1	1	1	1	1
Unit Trusts	2	4	2	2	2	2	2	2
Prop Trusts	0	1	1	1	0	0	0	0
Invest. Advs	3	11	10	11	11	11	11	11
Stock Brokers	1	3	3	3	3	3	3	3
Dealers	1	2	3	3	3	3	3	3
Mgd Fund Rep	N/A	N/A	N/A	9	11	12	12	15
Stock Brok Rep	N/A	N/A	N/A	18	16	14	15	17
Inves. Adv. Rep	N/A	N/A	N/A	22	21	19	19	19
Total	**366**	**411**	**382**	**459**	**412**	**430**	**503**	**603**

(Source: Reserve Bank of Fiji)

Table 2: The Total Gross Assets of Financial Institutions in Fiji: (F$ m)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Institutions														
Regulated														
Com Banks	2129	2580	2626	3043	3547	3962	4008	4452	4514	4954	5389	6222	7281	8688
(% of Total Assets)	34.88	38.20	37.10	38.83	40.65	42.31	41.89	43.19	42.88	44.3	44.8	46.8	50.6	53.0
Cedit Instn	205	245	293	362	401	370	348	372	418	448	506	546	252	335
(% of Total Assets)	3.36	3.63	4.14	4.62	4.60	3.95	3.64	3.61	3.97	4.0	4.2	4.1	1.7	2.0
Ins Comp	570	609	668	711	705	825	804	921	940	1044.0	1212.0	1307.0	1347.0	1438.0
(% of Total Assets)	9.34	9.02	9.44	9.07	8.08	8.81	8.40	8.94	8.93	9.3	10.1	9.8	9.4	8.8
FNPF	2604	2745	2937	3074	3337	3437	3969	3841	3928	4077	4235	4521	4846	5244
(% of Total Assets)	42.67	40.64	41.49	39.22	38.24	36.70	41.48	37.27	37.32	36.47	35.24	33.98	33.65	31.98
Ins Brokers	N/A	N/A	N/A	N/A	N/A	N/A	32	31	34	34	41	62	55	38
(% of Total Assets)	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.30	0.32	0.30	0.34	0.47	0.38	0.23
Non-Regulated														
Non Bank Fin	595	575	555	647	736	770	680	690	692	621	635	648	622	654
(% of Total Assets)	9.75	8.51	7.84	8.26	8.43	8.22	7.11	6.69	6.57	5.56	5.28	4.87	4.32	3.99
TOTAL	**6103**	**6754**	**7079**	**7837**	**8726**	**9364**	**9568**	**10307**	**10526**	**11178**	**12018**	**13306**	**14403**	**16397**

(Source: Reserve Bank of Fiji)

A high ratio indicates an inefficient bank. A declining ratio indicates rising bank efficiency. A high ratio signals a large proportion of non-performing loans; the latter are inversely related to bank's profitability. A high ratio also shows poor asset quality. Asset quality is inversely related to bank inefficiency (Adelou, 2014). Large banks have the ability to generate more fee income and exercise greater control over their ex-

penses compared to smaller banks that need to have a combination of cost cutting, open sources to generate fee income to raise efficiency.

Other than a simple measure as outlined above, there can be more sophisticated measures as well. Sathye (2003) summarizes some of the issues researchers in developing countries face. Referring to employment of financial ratios, he cites the study by Yeh (1996), pointing out the demerits of reliance on benchmark ratios. He refers them as being generally arbitrary. Another criticism is that financial ratios do not capture the long term performance. They also aggregate many aspects of performance such as operations, marketing and financing. Sathye (2003), and some others (for example, Seiford and Thrall, 1990; Molynux et al; 1996) have employed a non-parametric approach known as data envelopment analysis (DEA)[1], which was initially developed by Charnes et al. (1978).

DEA is a linear programming technique; it is sensitive to the choice of variables. DEA picks a year and analyses a sample of banks for which full information is available. Two approaches are possible on this: production approach (PA) and intermediation approach (IA). Under PA, a number of accounts of deposits or loans are used as inputs and outputs respectively. The assumption is banks use deposits as inputs and financial services as outputs. Under IA, banks are seen as financial intermediaries which use deposits as inputs, and loans as output. Using DEA, the mean efficiency of banks is calculated and compared with the world mean efficiency. If the mean efficiency is lower than the world efficiency, the conclusion is there is a need for the banks to improve their efficiency. The DEA procedure is applied to a given year. The trend can be seen only when this is done for a number of separate years. This is a laborious procedure not only for a given country but also for calculating the world mean efficiency for each year.

Our objective is to build up a data series for Fiji from the time when data is available. The approach has to be simple and measurement easy and replicable. This would enable the series to be updated with minimum effort.

Campa and Hernando (2006) suggest benefit and cost approach. A modified index of bank efficiency index (BEI) is calculated following the procedure given below:

$$BEI = \sum_{b=1}^{n} \left\{ \frac{\text{Net Profit}}{\text{Operating Expenses}} \right\} * 100$$

where, BEI = bank efficiency index; b = bank; n = number

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[1] For a good summary of the techniques and variations of DEA, see Coelli (1996), Bhattacharya et al (1997).

This formula is applied to calculate BEI for Fiji. Since we have access only to the consolidated bank data only[2], we calculate BEI for the banking system as a whole, beginning from 2002 Quarter 1.

Results

Applying the BEI calculation procedure employed by Campa and Hernanado (2006), we present the tabulated data on net interest income (interest earned on loans *minus* interest paid on deposits), income (charges and fees and others), and net profit (total income minus total operating expenditure, including provision for bad loans) in Figure 1.

Figure 1
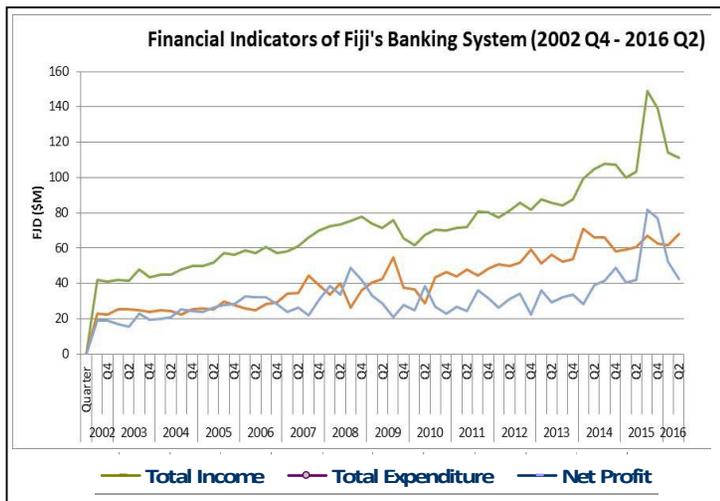
(Source: Reserve Bank of Fiji)

Results show that BEI has been subject to fluctuations in the initial two years (2002 and 2003) with a steady rise in BEI thereafter, beginning from 2004 Qr. 2, peaking up in 2006 Qr. 2 (at 154) and declining in the next two quarters (See Table 3; Figure 2.). It is noteworthy that these two years (2004 to 2006) witnessed a credit boom (Jayaraman and Choong,

2007). The decrease in BEI beginning in 2007 Qr. 1, marking the impact of military coup of late December 2006, was briefly halted in 2008. The BEI again came down in the next five quarters up to 2010 Qr. 1. However, BEI shot up to 158 in 2010 Qr. 2. The BEI began to slide down from 2010 Qr.3 to lower than 100. It got back to 100 only in 2014 Qr. 4. Thereafter until the end of our study period, there has been volatility in BEI.

Figure 2: Fiji Bank's Efficiency Index from 2002-2016
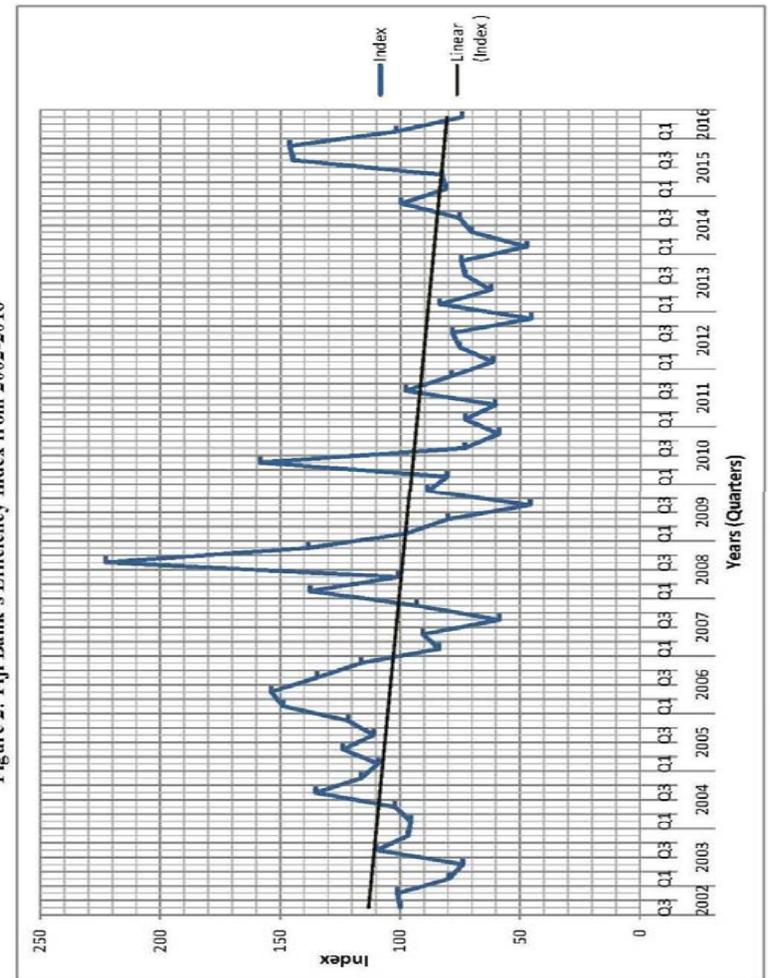
(Data Source: RBF Quarterly Reports (2002-2016)_

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[2] We approached Fiji's commercial banks without any success. The RBF declined to make the data series for individual banks in the interests of confidentiality.

Table 3: Fiji Banking Efficiency, 2002-2017
(All figures except last two columns are in \$Fm)

Year	Qtr	Net Int Income	Other Income	Total Income	Operating Exp.	Bad Debt	Total Expenditure	Net Profit	Efficiency Ratio	Index
2002	Q3	24.05	17.96	42.01	21.21	1.64	22.85	19.16	0.84	100
	Q4	23.09	18.24	41.33	19.97	2.39	22.36	18.97	0.85	101
2003	Q1	23.6	18.55	42.15	22.88	2.39	25.27	16.88	0.67	80
	Q2	24.56	16.87	41.43	21.83	3.75	25.58	15.85	0.62	74
	Q3	24.63	23.51	48.14	21.06	3.99	25.05	23.09	0.92	110
	Q4	25.32	18.05	43.37	22.25	1.69	23.94	19.43	0.81	97
2004	Q1	26.31	18.75	45.06	22.89	2.12	25.01	20.05	0.80	95
	Q2	25.54	19.63	45.17	22.32	2	24.32	20.85	0.86	102
	Q3	27.22	20.96	48.18	21.68	0.89	22.57	25.61	1.13	135
	Q4	29.2	20.6	49.8	22.7	2.5	25.2	24.6	0.98	116
2005	Q1	28.7	21.1	49.8	23.8	2.2	26	23.8	0.92	109
	Q2	29.87	22.23	52.1	23.31	2.24	25.55	26.55	1.04	124
	Q3	34.49	22.92	57.41	27.81	1.9	29.71	27.7	0.93	111
	Q4	34.4	21.8	56.2	26.7	1.1	27.8	28.4	1.02	122
2006	Q1	35.7	23	58.7	26.3	-0.2	26.1	32.6	1.25	149
	Q2	34.2	23.3	57.5	26	-0.9	25.1	32.4	1.29	154
	Q3	37.8	23.1	60.9	29.9	-1.3	28.6	32.3	1.13	134
	Q4	34.7	22.8	57.5	28.7	0.4	29.1	28.4	0.98	116
2007	Q1	36.2	22.2	58.4	30.7	3.6	34.3	24.1	0.70	84
	Q2	40.3	21.1	61.4	30.1	4.8	34.9	26.5	0.76	90
	Q3	41.9	24.2	66.1	33	11.3	44.3	21.8	0.49	59
	Q4	46	23.8	69.8	33.7	5.5	39.2	30.6	0.78	93
2008	Q1	48.7	23.9	72.6	32.4	1.3	33.7	38.9	1.15	137
	Q2	49.6	24	73.6	35.1	4.8	39.9	33.7	0.84	101
	Q3	50.2	25	75.2	32.4	-6.2	26.2	49	1.87	223
	Q4	51.5	26.5	78	31.9	4.2	36.1	41.9	1.16	138
2009	Q1	48.4	25.8	74.2	33.2	7.6	40.8	33.4	0.82	97
	Q2	45	26.6	71.6	34.3	8.5	42.8	28.8	0.67	80
	Q3	40.6	35.1	75.7	37.7	17	54.7	21	0.38	46
	Q4	38	27.6	65.6	38	-0.4	37.6	28	0.74	89
2010	Q1	34.7	26.8	61.5	36.2	0.5	36.7	24.8	0.68	80
	Q2	34.7	32.9	67.6	37.8	-8.8	29	38.6	1.33	158
	Q3	37	33.7	70.7	43.3	0.5	43.8	26.9	0.61	73
	Q4	39.4	30.4	69.8	44.6	2.1	46.7	23.1	0.49	59
2011	Q1	39.8	31.5	71.3	43.2	1	44.2	27.1	0.61	73
	Q2	39.7	32.5	72.2	46.5	1.4	47.9	24.3	0.51	60
	Q3	41.9	38.8	80.7	43.2	1.1	44.3	36.4	0.82	98
	Q4	42.8	37.6	80.4	45	3.4	48.4	32	0.66	79
2012	Q1	43.2	34.1	77.3	45.3	5.7	51	26.3	0.52	61
	Q2	45.2	35.9	81.1	47.3	2.4	49.7	31.4	0.63	75
	Q3	46.48	39.35	85.83	47.35	4.42	51.77	34.06	0.66	78
	Q4	45.1	36.7	81.8	56.3	2.9	59.2	22.6	0.38	45
2013	Q1	44.1	43.4	87.5	50.8	0.6	51.4	36.1	0.70	84
	Q2	46.23	39.34	85.57	50.98	5.2	56.18	29.39	0.52	62
	Q3	47.27	37.04	84.31	46.03	6.24	52.27	32.04	0.61	73
	Q4	49.4	38.1	87.5	49.9	3.9	53.8	33.7	0.63	75
2014	Q1	59.9	39.6	99.5	60.8	10.4	71.2	28.3	0.40	47
	Q2	55.5	49.6	105.1	54	12.1	66.1	39	0.59	70
	Q3	57.9	49.9	107.8	59.5	6.5	66	41.8	0.63	75
	Q4	59.6	47.7	107.3	51.5	6.9	58.4	48.9	0.84	100
2015	Q1	55.8	44.1	99.9	53.9	5.5	59.4	40.5	0.68	81
	Q2	57.2	46	103.2	56.3	4.6	60.9	42.3	0.69	83
	Q3	83	66.1	149.1	65.8	1.5	67.3	81.8	1.22	145
	Q4	85.5	53.7	139.2	60.9	1.6	62.5	76.7	1.23	146
2016	Q1	63.3	50.9	114.2	61.3	0.3	61.6	52.6	0.85	102
	Q2	62.1	48.9	111	60.4	7.9	68.3	42.7	0.63	74

(Data Source: RBF Quarterly Reports)

Summary and Conclusions

Results show that efficiency had been falling from the third quarter of 2010 to the third quarter of 2014, and was below the benchmark of 100. This trend was arrested in the last quarter of 2014, but thereafter the index showed violent fluctuations until mid-2016.

The limited information not withstanding, results may be useful for depositors and borrowers, bank managements, and policy makers at RBF and government. The results indicate possibilities for further research, particularly into the factors behind the variations in the efficiency index. These would require examination of determinants of causes, inter alia, much beyond the realm of banking operations.

The paper measured banking efficiency by applying a simple bene-fit-cost quantification procedure, which involves the measurement of net profits and the costs to generate them. Results show that efficiency had been falling from the third quarter of 2010 to the third quarter of 2014, and was below the benchmark of 100. This trend was arrested in the last quarter of 2014, but thereafter the index showed violent fluctuations until mid-2016.

A constraint to the study was the lack of information on individual bank performances. This itself indicates further prospects of research in this area, were researchers to gain access to individual bank data. In addition, further research is needed, particularly on the factors behind the variations in the efficiency index. These would require examination of the determinants of causes, inter alia, beyond the realm of banking operations.

One point of interest, viewed from policy angle, is whether directions from the central bank would affect profits of Fiji's commercial banks. It may be recalled that RBF made a significant policy change in 2011, according to which banks were required to reduce the interest rate spread to 4 per cent. A review of the impact on banks' income showed that the reduced interest affected only the net interest income, not the non-interest income, such as those received from fees and charges levied on customers for specific services. The banks compensated the loss by appropriate periodical changes in fees and charges from time to time. Detailed examination of the impacts of the directives and how banks have been responding over a period of time would be necessary.

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