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Full Length Research Paper

A comparison of financial performance of commercial banks: A case study of Nepal

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The objective of this study was to compare the financial performance of different ownership structured commercial banks in Nepal based on their financial characteristics and identify the determinants of performance exposed by the financial ratios, which were based on CAMEL Model. Eighteen commercial banks for the period 2005 to 2010 were financially analyzed. In addition, econometric model (multivariate regression analysis) by formulating two regression models was used to estimate the impact of capital adequacy ratio, non-performing loan ratio, interest expenses to total loan, net interest margin ratio and credit to deposit ratio on the financial profitability namely return on assets and return on equity of these banks. The results show that public sector banks are significantly less efficient than their counterpart are; however domestic private banks are equally efficient to foreign-owned (joint-venture) banks. Furthermore, the estimation results reveal that return on assets was significantly influenced by capital adequacy ratio, interest expenses to total loan and net interest margin, while capital adequacy ratio had considerable effect on return on equity.

Key words: Financial performance, commercial banks, financial ratios analysis, Nepal.

INTRODUCTION

Financial sector is the backbone of economy of a country. It works as a facilitator for achieving sustained economic growth through providing efficient monetary intermediation. A strong financial system promotes investment by financing productive business opportunities, mobilizing savings, efficiently allocating resources and makes easy the trade of goods and services. Several studies (McKinnon, 1973; Levine, 1997) have reported that the efficacy of a financial system to reduce information and transaction costs plays an important role in determining the rate of savings, investment decisions, technological innovations and hence the rate of economic growth.

Banking has become an important feature, which renders service to the people in financial matters, and its magnitude of action is extending day by day. It is a major financial institutional system in Nepal, which accounted for more than 70% (Poudel, 2005) of the total assets of all the financial institutions. A profitable and sound banking sector is at a better point to endure adverse upsets and adds performance in the financial system (Athanasoglou et al., 2008).

A competitive banking system promotes the efficiency and therefore important for growth, but market power is necessary for stability in the banking system (Northcott, 2004). Commercial bank holds a large share of economic activities of a country. The function of the commercial banks has been enhanced in Nepal to sustain the increasing need of the service sector and the economy in general (Economic Survey, 2008).

Stock market has been dominated by the commercial banks since a decade. Not only the stock market, but the commercial banks have also been major contributors to the revenue of the country. They have been paying a large amount of tax every year.

Performance evaluation is the important approach for enterprises to give incentive and restraint to their operators and it is an important channel for enterprise stakeholders to get the performance information (Sun, 2011). The performance evaluation of a commercial bank is usually related to how well the bank can use its assets, shareholders' equities and liabilities, revenues and

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expenses. The performance evaluation of banks is important for all parties including depositors, investors, bank managers and regulators.

The evaluation of a firm's performance usually employs the financial ratio method, because it provides a simple description about the firm's financial performance in comparison with previous periods and helps to improve its performance of management (Lin et al., 2005).

Moreover, the ratio analysis assists in determining the financial position of the bank compared to other banks. Financial ratios based on CAMEL Framework are related to capital, assets, management, earnings and liquidity considerations.

Different ratios including return on assets (ROA), return on equity (ROE), capital adequacy ratio (CAR), non-performing loan ratio (NPL), interest expense to total loans (IETTL), net interest margin (NIM), credit to deposit ratio (CDR), were evaluated to analyze the financial data of selected Nepalese commercial banks for the period 2005 to 2010. These ratios would help to indicate the condition of capital, assets quality, management, earning and liquidity position of different types of banks.

Financial ratio analysis is also used to quantitatively examine the differences in performance among public sector banks (PVB), joint venture banks (JVB) and domestic private banks (DPB) in Nepal, and the banks are ranked based on their financial measures and performance for each bank as a guideline for the future trend of financial position of the banks in Nepal.

Therefore, the aim of this study is to measure the best performance among the commercial banks and to find out the relationship between bank specific factors (Ratios) on the banks' performance. Based on the objectives, the present study seeks to test the following hypothesis:

H_1: There is a significant relationship between capital adequacy ratios and performance of the banks.
H_2: There is a significant relationship between asset quality ratios and performance of the banks.
H_3: There is a significant relationship between management efficiency ratios and performance of the banks.
H_4: There is a significant relationship between earning ratios and performance of the banks.
H_5: There is a significant relationship between liquidity ratios and performance of the banks.

The factors considered for analysis include ROA and ROE (profitability ratio) as dependent variables, which each examines separately with same explanatory variables that is, CAR, NPL, IETTL, NIM, CDR.

The remainder of the paper is organized as follows: subsequently, the study presents the literature review. Next, it describes the banking sector in Nepal. Thereafter, it presents the methodology of the study followed by details of the results and analysis of the available data and finally, the study was concluded.

LITERATURE REVIEW

The trend of commercial banking is changing rapidly. Competition is getting stiffer and, therefore, banks need to enhance their competitiveness and efficiency by improving performance. Normally, the financial performance of commercial banks and other financial institutions has been measured using a combination of financial ratios analysis, benchmarking, measuring performance against budget or a mix of these methodologies (Avkiran, 1995).

Gopinathan (2009) has presented that the financial ratios analysis can spot better investment options for investors as the ratio analysis measures various aspects of the performance and analyzes fundamentals of a company or an institution.

Furthermore, Ho and Zhu (2004) have reported that the evaluation of a company's performance has been focusing the operational effectiveness and efficiency, which might influence the company's survival directly. The empirical results of the researches (Raza et al., 2011; Tarawneh, 2006) explained that a company, which has better efficiency, it does not mean that always it will show the better effectiveness. Alam et al. (2011) study concludes that ranking of banks differ as the financial ratio changes.

Bakar and Tahir (2009) in their paper used multiple linear regression technique and simulated neural network techniques for predicting bank performance. ROA was used as dependent variable of bank performance and seven variables including liquidity, credit risk, cost to income ratio, size and concentration ratio, were used as independent variables.

They concluded that neural network method outperforms the multiple linear regression method however it need clarification on the factor used and they noted that multiple linear regressions, not withstanding its limitations, can be used as a simple tool to study the linear relationship between the dependent variable and independent variables.

Neceur (2003) using a sample of ten Tunisian banks from 1980 to 2000 and a panel linear regression model, reported a strong positive impact of capitalization to ROA. There are number of studies, which examine the bank performance using CAMEL framework, which is the latest model of financial analysis.

Elyor (2009) and Uzhegova (2010) have used CAMEL model to examine factors affecting bank profitability with success. The CAMEL Framework is the most widely used model (Baral, 2005). The Central bank of Nepal (NRB) has also implemented CAMEL Framework for performance evaluation of the banks and other financial institutions.

CAMEL stands for capital adequacy, asset quality,

management efficiency, earnings performance and liquidity. The capital adequacy ratio is a key measure to determine the health of banks and financial institutions. Capital adequacy refers to the sufficiency of the amount of equity to absorb any shocks that the bank may experience (Kosmidou, 2008).

Nepalese commercial banks need to maintain at least 6% Tier-1 capital and 10% total capital (Tier 1 and Tier 2), that is, core capital and supplementary capital respectively. Tier 1 capital consists of paid-up capital, share premium, non-redeemable preference share, general reserve fund, accumulated profit, capital redemption reserve, capital adjustment fund, and other free reserves. The Tier 2 capital comprises of capital comprises of general loan loss provision, assets revaluation reserve, hybrid capital instruments, subordinated term loan, exchange equalization reserve, excess loan loss provision, and investment adjustment reserve.

These minimum capital adequacy requirements are based on the risk-weighted exposures of the banks (NRB, 2010). Credit risk is one of the factors that affect the health of an individual bank while asset quality analysis involves taking account of the likelihood of borrowers paying back loans. The extent of the credit risk depends on the quality of assets held by an individual bank.

The quality of assets held by a bank depends on exposure to specific risks, trends in non-performing loans, and the health and profitability of bank borrowers (Baral, 2005). Poor asset quality and low levels of liquidity are the two major causes of bank failures. Poor asset quality led to many bank failures in Kenya in the early 1980s (Olweny and Shipo, 2011).

NRB uses composition of assets, nonperforming loan to total loan ratio, net nonperforming loan to total loan ratio as the indicators of the quality of assets of the commercial banks (NRB, 2010). The maximum NPL allows for a healthy bank is 5%. Management quality plays a big role in determining the future of the bank. The management has an overview of a bank's operations, manages the quality of loans and has to ensure that the bank is profitable.

Rahman et al. (2004) and Elyor (2009) noted that interest expenses divided to total loans can be measured as the bank management quality. Ability to support the present and future operations of a bank depends on the quality of its earnings and profitability profile (Share et al., 2011). NRB uses return on total assets as an indicator of profitability of a commercial bank.

In addition, it uses the absolute measures such as interest income, net interest income, non-interest income, net non-interest income, non-operating income, net non-operating income and net profit, to evaluate the profitability of a commercial bank (NRB, 2010). Liquidity management is one of the most important functions of a bank. If funds tapped are not properly utilized, the institution will suffer loss (Sangmi and Nazir, 2010).

THE COMMERCIAL BANKS IN NEPAL

Financial development in many developing economies like Nepal is still faced by a number of obstacles such as macroeconomic instability, the fragility of stock markets, the limitation of capital markets, and the inefficiency of development and specialized banks.

Despite some of these limitations, banking systems in underdeveloped countries remain integral components of the general economic systems and they can be considered as a key element in any development effort (Zeinab, 2006).

The commercial banks are currently regarded as key driver of financial institutions of Nepal. Financial services sector had commenced with the establishment of Nepal Bank Limited in 1937 (Baral, 2005). After the liberalization in the mid 1980s, the government permitted the opening of commercial banks in joint venture with foreign banks. Since then, the Nepalese financial system has undergone rapid structural changes, with a large number of financial institutions expose and display of financial products and services.

There are presently 263 financial institutions among them 27 are commercial banks (NRB, 2010). The market size of both the joint venture and domestic private banks has been increasing at the expense of the public sector banks, which are shrinking over time. The commercial banks are divided into three separate groups based on ownership namely, (i) public sector banks, (ii) joint venture banks, and (iii) domestic private banks.

Public sector banks

Public sector banks have substantial shares in the total assets of the industry and have huge branch networks around the country. Rastriya Banijya Bank (RBBL), Nepal Bank Limited (NBL) and Agriculture Development Bank (ADBL) are government owned banks. These banks have significant contribution on improving banking habit among the people at large and encourage entrepreneurship in both the urban as well as rural area. The public sector banks are still the largest banks in all aspects from deposit and credit mobilization to the number of branches in operation.

Joint venture banks

The joint venture banks have very few branch networks and are concentrated in urban centers. JVBs started to establish since mid-1980s (Poudel, 2005) and there are seven in Nepal (NRB, 2010) including; Nabil Bank Ltd (NABIL), Standard Charter Bank Ltd (SCBL), Himalayan

Bank Ltd (HBL), Nepal SBI Bank Ltd (NSBI), Nepal Bangladesh Bank Ltd (NBBL) and Everest Bank Ltd (EBL). They have foreign equity participation (along with domestic) and management with good name with international reputation, conducting banking business professionally. They are well mechanized and supervised by their respective home country supervisory authorities. The share of total assets of the joint venture banks has been increased to about 50% of total commercial bank assets. The introduction of joint venture banks infused modern banking and financial technology and new financial instrument in the financial system. However, the spillover effect of their efficient management and modern banking skills was less in the domestic banks, as per expectation.

Domestic private banks

Domestic private banks came in operation by late 1990s and early 2000s. There are seventeen domestic private banks including; Nepal Investment Bank Ltd (NIBL), Bank of Kathmandu Ltd (BOK), Nepal Credit and Commerce Bank Ltd (NCCBL), Lumbini Bank Ltd (LBL), Nepal Industrial and Commercial Bank Ltd (NIC), Machhapuchhre Bank Ltd (MPBL), Kumari Bank Ltd (KBL), Laxmi Bank Ltd (LXBL) and Siddhartha Bank Ltd (SBL).

They are managed and owned by private sector without foreign equity participation. Since they are relatively new banks, they have the opportunity to start as 'fresh banks' without bad loans in their portfolios and with the possibility of adopting recent banking technologies during their inception. Most of them are relatively small in asset size as well as their networks.

METHODOLOGY

The purpose of this study is to evaluate the factors determining the performance of the Nepalese commercial banks. The data are mainly obtained from the Nepal Rastra Bank Bulletin (published by the Central Bank of Nepal), annual audited financial statements of commercial banks (published by the respective banks), and yearly economic survey. Average of six years ratios from 2005 to 2010 was evaluated to assess the financial performance of the commercial banks in Nepal.

Eighteen commercial banks, which have been established before 2005 in Nepal, were selected for the analysis in this study. The financial ratios used to assess bank performance were taken based on the CAMEL Framework such as capital adequacy, asset quality, management, earnings and liquidity. All the ratios were used to test the hypothesis.

This study uses a descriptive financial analysis to describe, measure, compare, and classify the financial situations of Nepalese commercial banks and as well as applied an econometric multivariate regression model to test the significance of variables on performance of Nepalese commercial banks. The profitability ratios (ROA and ROE) are assumed as dependent variables while capital adequacy ratio (CAR), non-performing loan ratio (NPL), interest expenses to total loan (IETTL), net interest margin ratio (NIM) and credit to deposit ratio (CDR) are as independents variables.

Econometric models

This study examined the effects of bank specific variables on:

$$ROA = \beta_0+\beta_1X_1+\beta_2x_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\varepsilon.... \quad (1)$$

$$RO E = \beta_0+\beta_1X_1+\beta_2x_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\varepsilon .... \quad (2)$$

Where, X_1- CAR (Tier 1 Capital + Tier 2 Capital / risk weighted assets), X_2- NPL (non-performing loans/total loans), X_3- IETTL – Interest expense / total loans, X_4- NIM – Net interest margin, X_5- CDR- Credit to deposit ratio.

In the previous equation, β_0 is constant and β is coefficient of variables while ε is the residual error of the regression. All estimations have been performed in the SPSS software program whereas the ordinary calculations in Excel.

RESULTS AND DISCUSSION

Financial ratios of commercial banks in Nepal

Profitability

In this study, the position of profitability has been measured with the help of return on assets and return on equity. Return on assets (ROA) is a comprehensive measure of overall bank performance from an accounting perspective (Sinkey and Joseph, 1992). Table 1, column 1 depicts average ROA of major commercial banks in Nepal for the period 2005 to 2010.

The average ROAs of all the premeditated banks have been estimated positive demonstrates that in the recent years, the performance of the banking system in Nepal is reasonable in terms of net profit. The average ROA of PSB (2.37%) was found higher than that of JVB (1.77%) and DPB (1.33%) due to having utmost total assets. The earning performance of PSB was satisfactory and no public banks were suffered from net operating loss.

Among the public sector banks, the average ROA of RBBL bank was determined 3.34% with positive trend during the study period. The net profit to total assets ratio of RBBL bank to gain profit seemed most attractive due to proper mobilization of available resources than other public banks has appeared better position. The second position was for ADBL bank with average ROA equaled to 1.94%.

Over the study period, there was a positive trend in ROA. The last position was belonged to NBL bank with average ROA equaled to 1.84% but ROA values computed during the study period were found positive. SCBL was maintained first place with ROA equaled to 2.51% among joint venture banks, while the second position was for NABIL bank (2.48%) and the last position was belonged to NSBI (1.13%).

The average ROA of BOK was noted 1.89% and this bank was ranked first position among the domestic private banks. The second position was for LBL bank with ROA equaled to 1.82% and the last position was belonged to NCCBL with ROA equaled to 0.43%. The

Table 1. Average ratio of the commercial banks measuring the banking performance.

Bank		Ratios (%)						
		ROA	**ROE**	**CAR**	**NPL**	**IETTL**	**NIM**	**CD**
PSB	NBL	1.84	-12.89	-28.77	17.27	6.27	3.49	42.9
	RBBL	3.34	-12.42	-38.75	27.21	5.37	3.41	51.27
	ADBL	1.94	6.44	5.59	14.69	5.31	5.61	112.82
	Average	2.37	-6.29	-20.64	19.72	16.95	12.51	69.00
JVB	NABIL	2.48	31.87	11.52	1.14	3.84	3.98	70.54
	SCBL	2.51	33.83	14.86	1.47	4.33	3.14	43.14
	HBL	1.51	22.32	11.36	4.28	3.60	3.69	61.5
	NSBI	1.13	15.69	12.14	4.09	4.50	2.86	70.92
	NBBL	1.37	8.44	-5.58	23.99	5.06	2.88	84.7
	EBL	1.62	25.98	11.64	0.84	7.39	4.75	76.01
	Average	1.77	23.02	9.32	5.97	28.72	21.30	67.80
DPB	NIBL	1.76	24.62	11.47	1.58	4.20	3.06	76.01
	BOK	1.89	24.65	12.11	2.48	4.16	3.33	77.6
	NCCBL	0.43	57.25	4.52	14.97	6.51	3.46	83.15
	LBL	1.82	-3.31	5.4	15.85	6.32	4.09	90.21
	NIC	1.55	18.29	12.91	1.55	5.47	2.82	84.33
	MPBL	0.87	9.00	11.92	1.25	5.58	2.77	81.96
	KBL	1.31	14.81	12.18	0.81	5.28	2.75	88.71
	LXBL	0.95	9.74	14.11	0.52	5.14	2.47	87.75
	SBL	1.39	14.40	11.87	0.91	5.15	1.90	93.4
	Average	1.33	18.83	10.72	4.43	47.83	26.65	84.79

average ROAs of NCCBL (JVB), MPBL (DPB) and LXBL (DPB) were estimated less than 1 fall in the marginal earning performance (Baral, 2005). As ROAs of the most of the larger banks were estimated greater than those of the smaller banks, it can be concluded that the larger banks were successful in mobilizing their available resources more effectively. Furthermore, availability of limited number of assets restricts the proper utilization of resources and ultimately the earning profit.

The ROE of the major commercial banks in Nepal are presented for the average of the six years in Table 1, column 2. The situation of PSB was most awful with fluctuating and negative ROE trends. The average ROE ratio was -12.89% for NBL, -12.42% for RBBL and 6.44% for ADBL. This implies that the shareholders receive very low returns in terms of dividend.

The ROE of ADBL was only estimated in positive among the three public banks. It seems ADBL was efficiently utilizing its shareholders' funds. The average ROEs for the JVB were noted better than PSB and stood positive over the period 2005 to 2010. In order to rank the JVBs based on this ratio, SCBL was the first one; it has an average ROE of 33.83%.

The second position was for NABIL with ROE equaled to 31.87%, and the last position was belonged to NBBL with ROE equaled to 8.44%. It shows that JVB had satisfactory earning profit and the shareholders earn better return on their investment.

The average ROEs of all DPB were going positive except that of LBL. In order to rank the banks based on this ratio, NCCBL was the first one. It had an average ROE of 57.25%. The second position was for BOK with ROE equaled to 24.65%, and the last position was belonging with LBL with ROE equaled to -3.31%. It shows DPBs were efficiently use their shareholders' funds and earning net profit in satisfactory level.

Capital adequacy

As stated in the foregoing analysis, banks under study are well capitalized and they are complying with the directive of NRB on capital adequacy ratio. However, their capital base relative to the risk-weighted assets is not so strong.

According to the international rating convention, total capital should be greater than 19.5% of the total risk weighted assets of commercial banks in order to be a strong capital base. However, none of the banks under study had the capital fund greater than 19.5% of the total risk weighted capital. As indicated by CAR, on the average, capital adequacy of joint venture banks was fair

during the study period. Total capital adequacy ratio less than 15 and equal to 12 indicates that capital adequacy is fair and on the average, this ratio falls within this range.

It is clear from Table 1 column 3 that the average capital adequacy ratio of two public banks NBL and RBBL were negative due to the heavy accumulated losses. Due to the inherent problems and big chunk of NPA, the public sector banks suffered from massive losses in the past, which had heavy impact on their capital adequacy. Although, the public banks had started to improve their financial condition, it is very different from an acceptable standard.

However, ADBL capital adequacy ratio was seemed to be positive but ADBL was also not achieved the NRB requirement. Most of the joint venture banks have accomplished the capital adequacy ratio as directed by NRB. The banks with non-compliance were NBBL (-5.58%). In addition, average capital fund ratio of joint venture banks during the study period hang around 14%. This was higher than the minimum ratio specified by NRB. This clearly implies that joint venture banks are complying with the directive of NRB on the requirement of the capital base of commercial banks.

All the selected domestic private banks had complied with the statutory capital adequacy ratio of 10%. The banks with non-compliance were LBL (5.4%) and NCCBL (4.52%). As transactions of the bank increases, the risk weighted assets also increases in the same manner.

However, this creates banks difficulty to maintain capital fund as required by the NRB as often capital do not increase and the performance of the bank (that is, earning of profit) has major role to play to comply with the NRB requirements. As such, it is evident that the domestic private bank has been performing well enough to comply with the NRB requirement without failure at any point of time except LBL. It means domestic bank has mobilized capital from the stock market; hence, the bank has been capable to sustain the assurance of shareholders and depositors.

Asset quality

It is obvious from the theoretical prescription that the performance of commercial banks largely depends on the quality of assets held by them, and quality of the assets relies on the financial health of their borrowers.

As stated earlier, many indicators can be used to measure the quality of assets held by commercial banks. Loans are one of the major outputs provided by a bank, but as loan is a risk output, there is always an ex ante risk for a loan to eventually become non-performing (Yike et al., 2011).

However, here, only one simple indicator – non-performing loan ratio was used to measure the quality of assets being held by the banks. The increasing trend of these ratios shows the deteriorating quality of commercial bank assets.

Table 1, column 4 depicts that in the period of 2005 to 2010, the average NPL ratio was 17.27% for NBL, 27.21% for RBBL and 14.69% for ADBL. The ratio of NPL in the public bank was very high when compared with the joint venture banks and domestic private banks. The share of public sector banks in NPL was extremely high accounting that simply indicates the degradation of quality of loans and concentration as well.

Among the JV banks, the average NPL ratio of NBBL and NCCBL were very high. These two banks were not satisfactory level. Other joint venture banks on the average were at reasonable level, but they are far below the aggregate percentage of non-performing assets of the commercial banks. NPL indictors show that joint venture banks were improving the quality of their assets year by year. Average NPL ratio of LBL was superior to other domestic private banks.

Other domestic private banks on the average were at reasonable level. However, the banks NPL ratio was below the aggregate percentage and was in decreasing trend. The declining ratio of NPL had reflected a better quality of their assets year by year.

Management

Table 1, column 5 exhibits average IETTL of major commercial banks in Nepal for the period 2005 to 2010. The average IETTL of PSB (16.95%) was found lower than that of JVB (28.72%) and DPB (47.83%) because management of the public sector banks was the least efficient among the sampled commercial banks. However, the joint venture and domestic private sector banks were managed the quality of loans and ensured profit.

ADBL (5.31%) management was the least efficient among the sampled public sector banks, whereas EBL (7.39%) management was the most efficient among the joint venture banks, and NCCBL (6.51%) was the efficient among the private sector banks.

Earning

The net interest margin (NIM) measures how large the spread between interest revenues and interest costs that management has been able to achieve by close control over earning assets and the pursuit of the cheapest sources of funding (Rose et al., 2006).

NIM has been treated as an extremely important measure to the bank and its minimum value for a healthy bank is considered about 4%. A small change in the interest margin has a huge impact on profitability. Higher NIM is associated with profitable banks by maintaining good asset quality. The public sector banks in Nepal are entirely different from joint-venture banks and private

Table 2. Ranks of the commercial banks in Nepal.

Bank		Indications						
		ROA	ROE	CAR	NPL	IETTL	NIM	CD
PSB	NBL	6	18	17	16	4	6	18
	RBBL	1	17	18	18	7	8	16
	ADBL	4	15	13	13	8	1	1
JVB	NABIL	3	3	10	5	17	4	14
	SCBL	2	2	1	7	14	10	17
	HBL	11	7	12	12	18	5	15
	NSBI	15	9	5	11	13	13	13
	NBBL	13	14	16	17	12	12	6
	EBL	9	4	9	3	1	2	11
DPB	NIBL	8	6	11	9	15	11	11
	BOK	5	5	6	10	16	9	10
	NCCBL	18	1	15	14	2	7	8
	LBL	7	16	14	15	3	3	3
	NIC	10	8	3	8	6	14	7
	MPBL	17	13	7	6	5	15	9
	KBL	14	10	4	2	9	16	4
	LXBL	16	12	2	1	11	17	5
	SBL	12	11	8	4	10	18	2

banks. Table 1, column 6 indicates that the domestic banks had higher average NIM (26.65%) than that of public banks (12.51%) and joint venture banks (21.30%). It means domestic banks were able to maintain good asset quality.

While comparing the individual banks, the result was very different from the average values. Though ADBL is public sector bank, it was occupied first position with the highest interest margin of 5.61% while SBL, a domestic private bank, was in the last position with lowest interest margin of 1.90%.

The interest margin of EBL, a joint venture bank, was 4.75% and ranked in second position. Among the all commercial banks only ADBL, NABIL, EBL and LBL were maintained minimum level. It seems the profitability of the banks in Nepal was not so satisfactory.

Liquidity

The credit to deposit ratio (CDR) is a major tool to examine the liquidity of a bank and measures the ratio of fund that a bank has utilized in credit out of the deposit total collected. Higher the CDR more the effectiveness of the bank to utilize the fund it collected.

As per the Table 1, column 7, the CDR of the public banks shows that their liquidity position was lower than the accepted level. However, ADBL was seemed to more efficient to utilize their funds collected as deposit. During the study period, the average CDR of NBL was 39.58% while that of RBBL was 51.14% and ADBL was 111.01%.

Although there is no standard for CDR in Nepal, a ratio of 75% can be accepted to be adequate. The CDR of the bank was quite consistent over the past five years beginning from 2005-2010. Among the six joint venture banks, the average CDR of NBBL was higher than other JV banks. In an average, the bank has been able to utilize two-third portion of the depositors fund in the form of credit. The CDR of domestic private banks was in the accepted level. The CDR of domestic private banks was higher than 75% level, which is adequate.

In order to rank the banks, SBL was the first one; it has an average CDR of 93.04%. The second position was for LBL bank with CDR equaled to 90.21%, and the last position was belonged to NIBL bank with 76.01%. It seems domestic private banks are efficient to utilize the funds collected as deposit.

Ranking of the commercial banks

Different commercial banks had different ranking based on each financial ratio related to ROA, ROE, CAR, NPL, IETTL, NIM and CDR (Table 2). Based on the bank return on assets, the higher rank was for RBBL, which is a public sector bank, SCBL Bank, was the second, which is joint venture bank and the last position, belonged to NCCBL, a domestic private bank. Based on return on

Table 3. Correlation between ROA and other financial ratios.

		ROA	CAR	NPL	IETTL	NIM	CD
Pearson correlation	ROA	1.000	-.478	0.289	-0.251	0.314	-0.279
	CAR	-0.478	1.000	-0.825	-0.274	-0.106	0.513
	NPL	0.289	-.825	1.000	0.302	0.268	-0.226
	IETTL	-0.251	-.274	0.302	1.000	0.251	0.171
	NIM	0.314	-.106	0.268	0.251	1.000	0.096
	CD	-0.279	.513	-0.226	0.171	0.096	1.000

Table 4. Correlation between ROE and other financial ratios.

		ROE	CAR	NPL	IETTL	NIM	CD
Pearson correlation	ROE	1.000	0.619	-0.465	-0.167	-0.009	0.177
	CAR	0.619	1.000	-0.825	-0.274	-0.106	0.513
	NPL	-0.465	-0.825	1.000	0.302	0.268	-0.226
	IETTL	-0.167	-0.274	0.302	1.000	0.251	0.171
	NIM	-0.009	-0.106	0.268	0.251	1.000	0.096
	CD	0.177	0.513	-0.226	0.171	0.096	1.000

equity NCCBL belonged to first position, SCBL was second position and the lowest one was NBL. Based on capital adequacy ratio SCBL was first position, LXBL was second position and last position belonged to RBBL.

Based on the NPL ratio, LXBL was first position while KBL was second position and last position belonged to RBBL. Based on interest expenses to total loan, EBL was in the first position; NCCBL was occupied second position while the last position was for LBL.

Based on net interest margin, the first position was for ADBL while EBL was occupied the second position and SBL was in the last position. Based on credit to deposit ratio, ADBL was first position, SBL was second position and last position belonged to NBL.

Correlation analysis

The relationships among the study variables depicted in the model were tested using correlation with ROA and ROE separately with determinants of the bank's profitability ratio, which is presented in Tables 3 and 4, respectively.

Results show that ROA was negatively correlated with CAR (-0.478), IETTL (-0.251) and CDR (-0.279) because of heavy accumulated loss and capital below prescribed limit in the public banks in Nepal.

Moreover, improper calculation of risk weighed exposure also made CAR to be negatively correlated with ROA. The negative coefficient estimates of the correlation resulted in these ratios had inverse relationship with ROA. In contrast, NPL (0.289) was positively correlated with ROA depicts that the commercial banks in Nepal could effectively manage its credit risk. NIM (0.314) was also found positively correlated with ROA. The positive coefficient estimates of the correlation implied that there was direct relationship of NPL and NIM with ROA.

It can be seen that ROE was positively correlated with CAR and CDR. It indicates that an increase in CAR or CDR will lead to an increase in ROE while NPL, IETTL and NIM was found independent with the ROE because NPL, IETTL and NIM were negatively correlated.

The coefficient of correlations for CAR (+0.619), CDR (+0.177), NPL (-0.465), IETTL (-0.167), NIM (-0.009) respectively, clearly show that none of the variables were strongly correlated with ROE. The statistics also indicate that none of the variables in both cases was strongly correlated. Hence, there appeared to be no multi co-linearity problems. These have also been verified using variance inflation factor (VIF).

Regression statistics for the models (A) and (B)

The regression results for the commercial banks including the government, joint venture and domestic private banks are presented in Table 5. In the model (A), the value of R-square was 0.621, which means that 62% of the total variation in the value of ROA was due to the effect of the independent variables.

The adjusted R square was 0.464. This shows that on an adjusted basis, the independent variables were collectively 46.4% related to the dependent variable ROA. Durbin-Watson (DW) statistics is the ratio of sum of squares of successive differences of residuals to the sum of squares of errors. As a rule of thumb, if the DW statistic is less than 2, there is evidence of positive serial

Table 5. Coefficient analysis and collinearity statistics for the dependent variable ROA.

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	2.272	0.810		2.803	0.016		
CAR	-0.055	0.018	-1.228	-2.989	0.011	0.187	5.354
NPL	-0.047	0.027	-0.619	-1.726	0.110	0.245	4.081
IETTL	-0.377	0.137	-0.561	-2.762	0.017	0.764	1.309
NIM	0.362	0.150	0.464	2.413	0.033	0.852	1.174
CD	0.010	0.009	0.263	1.084	0.300	0.538	1.860
R-squared						0.621	
Adjusted R-squared						0.464	
Durbin-watson stat						2.489	

Table 6. Coefficient analysis and collinearity statistics for the dependent variable ROE.

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	19.372	24.677		0.785	0.448		
CAR	1.177	0.560	1.048	2.103	0.047	0.187	5.354
NPL	0.565	0.823	0.299	0.686	0.506	0.245	4.081
IETTL	1.254	4.160	0.074	0.301	0.768	0.764	1.309
NIM	0.650	4.566	0.033	0.142	0.889	0.852	1.174
CD	-0.293	0.278	-0.310	-1.054	0.313	0.538	1.860
R-squared						0.443	
Adjusted R-squared						0.211	
Durbin-watson stat						2.355	

correlation (Büyüksalvarcı and Abdioğlu, 2011).

The Durbin-Watson statistic was 2.489; it means that there was no serial correlation between independent variables and ROA. The relationship of the capital adequacy ratio was to be found negative and the coefficients were statistically significant ($p< 0.05$). The coefficient was -0.055, which depicts that the relationship might not be very strong.

However, it is clear that the weak negative relationship was due to the large volume of negative reserves of the two public banks, namely NBL and RBBL. The capital base still was a long way to achieve minimum capital requirement. In other side, NPL ratio was negative but insignificant. It is clear that there was a negative relationship between poor asset quality. This means the commercial banks, which failed to monitor their credit loans tend to be less profitable than those which paid particular attention to the assets quality.

IETTL was negatively significant with ROA at 5% level. It means a 0.561-point increase in IETTL will result in an on decrease of 1 point of ROA. The Net interest margin ratio and credit to deposit ratio recognized the positive relationship respectively, whereas NIM statistical coefficients was significantly affected by the performance. NIM will result in an on 0.464 point increase in NIM will result in a increase of 1 point of ROA and the result also exhibit that banks management has been able to keep the growth of interest income ahead of interest expenses. CD ratio was insignificantly affected. This exposes that increase in the level of credit to deposit significantly increased ROA of the banks by 0.263.

CDR was insignificant because the banks were not efficiently utilizing the funds collected as deposit. By analyzing variance inflation factor in ROA model, it can be said that all independent variables had tolerance value greater than 0.1. The results can prove that all variables had VIF value less than 10. This finding suggests that multicollinearity was not a problem when selected explanatory variables were used to develop the predicted model in the logistic regression analysis and to validate the evidence presented in correlation matrix.

Table 6 in the model (B) indicates that the value of R-square was 0.443, which means that 44.3% of the total variation in the value of ROE was due to the effect of the independent variables. The adjusted R square was 0.211. This shows that on an adjusted basis, the independent variables were collectively 21% related to the dependent variable ROE.

The Durbin-Watson statistic was 2.355; it means that there was no serial correlation between independent

variables and ROE. The relationship of the CAR was positively significant at 5% level while the other variables (NPL, IETTL, NIM, and CDR) were insignificant.

NPL was insignificant because of the result of poor credit policy including deprived appraisal and inadequate follow-up and supervision of loan distribution eventually. The IETTL and NIM ratio were positive but statistically insignificant. CD ratio was negative but insignificant because commercial banks are not concentrating more on credit and investment. More credit flows are required to verge on the optimum CD ratio.

By analyzing variance inflation factor in ROE model, it can be said that all independent variables had tolerance value bigger than 0.1. The results can prove that all variables have VIF value less than 10. This finding suggests that multicolinearity was not a problem when selected explanatory variables were used to develop the predicted model in the logistic regression analysis and to validate the evidence presented in correlation matrix.

The R square for ROA (0.621) was determined higher than ROE (0.443), suggesting the CAMEL framework appears to influence ROA better than ROE. In ROA model, the result shows that capital adequacy ratio, interest expenses to total loans, net interest margin significant while non-performing loan ratio and credit to deposit ratio were not significant. For that reason, hypothesis 1, 3 and 4 have been accepted and have a significant impact on performance of the commercial banks in Nepal and reject hypothesis 2 and 5 by accepting alternative null hypothesizes.

In ROE model, only capital adequacy ratio was significant while other variables non-performing loan ratio, interest expenses to total loans ratio, net interest margin ratio, credit to deposit ratio were not significant. Therefore, hypothesis 1 has been accepted while hypothesis 2, 3, 4 and 5 have been rejected by accepting alternative null hypothesizes.

Conclusions

Though financial ratios analysis compares the financial performance among commercial banks, the same bank had different ranks under the different financial ratios. The ROAs of public sector banks were higher than those of joint venture and domestic public banks due to having utmost total assets but the overall performance of public sector banks was not observed sound because other financial ratios including ROE, CDR, and CAR of most of the joint venture and domestic public banks were found superior.

High overhead costs, political interventions, poor management and low quality of collateral created continued deterioration in the financial health of the public sector banks.

The values determined for the financial ratios reveal that joint venture and domestic public banks are also not so strong in Nepal to manage the possible large-scale shocks to their balance sheet.

Furthermore, it can be concluded from the multiple regression analysis that the capital adequacy ratio, interest expenses to total loan and net interest margin were significant but had a negative effect on ROA while non-performing loan and credit to deposit ratio did not have any considerable effect on ROA. The capital adequacy ratio positively influenced the return on equity but the non-performing loan, credit to deposit ratio, interest expenses to total loan and net interest margin had no significant effect on ROE.

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