Effect of Credit Risk on the Performance of Nepalese Commercial Banks

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Abstract

This study has examined the effect of credit risk on performance of Nepalese commercial banks. The descriptive and causal comparative research designs have been adopted for the study. The pooled data of 14 commercial banks for the period 2010 to 2015 have been analyzed using regression model. The regression results revealed that 'non-performing loan ratio' has negative effect on bank performance whereas 'cost per loan assets' has positive effect on bank performance. In addition to credit risk indicators, bank size has positive effect on bank performance. Capital adequacy ratio and cash reserve are not considered as the influencing variables on bank performance. This study concludes that there is significant relationship between bank performance and credit risk indicators.

Key Words: Bank, Credit, Nepalese, Performance, Regression, Risk

JEL Classification: C88, G32, H81, M38, N25, O16

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I.   INTRODUCTION

Credit risk is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risk (Gieseche, 2004). It is a risk of financial loss if a borrower or counterparty fails to honor commitments under an agreement and any such failure has an adverse effect on the financial performance of the bank.

Coyle (2000) defines credit risk as losses from the refusal or inability of credit customers to pay what is owed in full and on time. It arises mainly from direct lending and certain off-balance sheet products such as guarantees, letters of credits, foreign exchange, forward contracts & derivatives and also from the bank's holding of assets in the form of debt securities. It may take the form of delivery or settlement risk. It is critical to bank survival or failure because banks traditionally earn their huge profits from interest on their risk exposures. The management of credit risk is a critical component of a comprehensive approach to risk management and is essential to the long-term success of a commercial bank.

Granting credit is one of the main sources of income (interest income) in commercial banks and also a source of credit risk. Therefore, the management of the risk related to that credit affects the profitability of the banks (Li and Zou, 2014). A bank exists not only to accept deposits but also to grant credit facilities, therefore inevitably exposed to credit risk. According to Chen and Pan (2012), credit risk is the degree of value fluctuations in debt instruments and derivatives due to changes in the underlying credit quality of borrowers and counterparties. Credit risk management maximizes bank's risk adjusted rate of return by maintaining credit risk exposure within acceptable limit in order to provide framework for understanding the impact of credit risk management on banks' profitability (Kargi, 2011). Demirguc-Kunt and Huzinga (1999) opined that credit risk management is in two-fold which includes, the realization that after losses have occurred, the losses becomes unbearable and the developments in the field of financing commercial paper, securitization, and other non-bank competition which pushed banks to find viable loan borrowers.

The main source of credit risk include, limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and liquidity levels, direct lending, massive licensing of banks, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank (Kithinji, 2010). An increase in bank credit risk gradually leads to liquidity and solvency problems.

A sound credit risk management framework is crucial for banks so as to enhance profitability and guarantee survival. According to Lindergren (1987), the key principles in credit risk management process are sequenced as follows: establishment of a clear structure, allocation of responsibility, processes have to be prioritized and disciplined, responsibilities should be clearly communicated and accountability assigned. Brownbridge (1998) concluded that effective quantitative models make it possible to numerically establish the factors that are important in explaining default risk, evaluating

the relative degree of importance of the factors, improving the pricing of default risk, screening out bad loan applicants and calculating any reserve needed to meet expected future loan losses. Margrabe (2007) postulates that even though credit risk remains the largest risk facing most commercial banks, the practice of applying modern portfolio theory to credit risk has lagged.

The importance of credit risk management to commercial banks cannot be overemphasized and it forms an integral part of the loan process. Loan and advances provided to borrowers may be at the risk of default, whereas banks extend the credit on the understanding that borrowers will repay their loans. Some borrowers usually default, and as a result, the bank's income decreases due to the need to increase loan loss provisions for such loans. Where commercial banks do not have an indication of what proportion of their borrowers will default, earnings will vary thus exposing the banks to an additional risk of variability of their profits (Onyiriuba, 2009). Effective management of credit risk can enhance banks' goodwill and depositors' confidence. Thus, good credit risk policy is an essential condition for banks' performance and capital adequacy protection.

Commercial banks are exposed to high risk loans. The higher is the accumulation of unpaid loans implying that these loan losses have produced lower returns to many commercial banks. Basel Committee on Banking Supervision (1999) asserts that loans are the largest and most obvious source of credit risk, while other are found on the various activities that the bank involved itself with. The indicators to measure the credit risk management: capital adequacy ratio (CAR) and non-performing loans ratio (NPLR), which are the main indicators used to assess the soundness of the banking system (Bhawani and Bhanumurthy, 2012). Likely, Kurawa and Garba (2014) have pointed out the credit risk management (CRM) indicators such as: default rate (DR), cost per loan assets (CLA), and capital adequacy ratio (CAR) which influence banks' profitability (ROA). However, every bank needs to identify measure, monitor and control credit risk and also determining how credit risks could be lowered. This means that a bank should hold adequate capital, control the non-performing loan and maintain the appropriate cost per loan assets.

Credit risk is accessed through analyzing the financial performance of commercial banks in an attempt to mitigate impacts arising from credit defaults. The financial health of the commercial banks depends on the possession of good credit risk management dynamics. Commercial banks may have a keen awareness of the need to identify, measure, monitor and control credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred.

Nepalese commercial banks have faced difficulties over the years for a multitude of reasons, the major cause of serious banking problems continues to be directly related to the relaxed credit standards for borrowers and counterparties, poor portfolio risk management whereby they fail to determine the best asset combination to invest in, which should have a negative correlation or lack of attention to changes in economic or other circumstances that can lead to a deterioration in the credit standing of a bank's counterparties thus, making them default in honoring their obligations as regards

repayment of the loans. However, in recent years, some policies have been reformed to improve banks performance and some measures have been taken to minimize on the negative effects of lending. They have focused on mergers to increase capital requirement and lessened the competition.

Most of the Nepalese commercial banks are found to approve the loans that are not well examined. This may lead to increase the loan defaults and non-performing loans. Thus, the existing procedures for credit risk management are not adequate to compete with the existing financial and economic challenges in Nepal. There is need to investigate whether this investment in credit risk management is viable to the banks. This study therefore seeks to investigate the impact of credit risk indicators on a bank's financial performance in Nepal. This study addresses how credit risk affects banks' financial performance using a robust sample and the findings would serve as the basis to provide policy measures useful to the various authorities on how to tackle the effect of credit risk in order to enhance the quality of banks' risky assets.

This study provides empirical evidence in confirming the validity of the theories to assist the bank's management in determining the best credit risk strategies that enhance bank performance. Moreover, the fact that the banking industry in Nepal is still growing and it should ensure that effective strategies are put in place to minimize risk and maximize loan performance at any particular point while in operation. Thus, this study aims to analyze the effect of credit risk on bank performance of commercial banks listed in the Nepalese Stock Exchange. The findings of this study may enable bank executives understand how credit risk affect the bank performance and they may then adopt the appropriate credit risk strategies.

The remainder of the study is outlined as follows- section two reviews related literature, section three discusses the research methodology, section four focuses on results and discussion, section five presents the conclusion and section six incorporates policy implications and research avenues.

II. LITERATURE REVIEW

Credit risk plays an important role on banks' profitability since a large chunk of banks' revenue accrues from loans from which interest is derived. However, credit risk may be a serious threat to the performance of banks. Therefore various researchers have examined the impact of credit risk on banks in varying dimensions. The major studies related to the issue of credit risk and bank performance have reviewed as follows:

Ahmed, Takeda and Shawn (1998) have found that loan loss provision has a significant positive influence on non-performing loans. Therefore, an increase in loan loss provision indicates an increase in credit risk and deterioration in the quality of loans consequently affecting bank performance adversely.

Mekasha (2001) has investigated credit risk management and its impact performance on Ethiopian Commercial Banks. The researcher used 10 years panel data from the selected commercial banks for the study to examine the relationship between ROA and loan

provision, non-performing loans and total assets. The study revealed that there is a significant relationship between bank performance and credit risk management.

Ahmad and Ariff (2007) have examined the key determinants of credit risk of commercial banks on emerging economy banking systems compared with the developed economies. The authors found that regulation is important for banking systems that offer multi-products and services; management quality is critical in the cases of loan-dominant banks in emerging economies. An increase in loan loss provision is also considered to be a significant determinant of potential credit risk. The authors further asserted that credit risk in emerging economy banks is higher than that in developed economies.

Ben-Naceur and Omran (2008) in an attempt to examine the influence of bank regulations, concentration, financial and institutional development on commercial banks' margin and profitability in Middle East and North Africa (MENA) countries from 1989-2005 have found that bank capitalization and credit risk have positive and significant impact on banks' net interest margin, cost efficiency and profitability.

Felix and Claudine (2008) have investigated the relationship between bank performance and credit risk management. It could be inferred from their findings that return on equity (ROE) and return on assets (ROA) both measuring profitability were inversely related to the ratio of non-performing loan to total loan of financial institutions thereby leading to a decline in profitability.

Kithinji (2010) has assessed the effect of credit risk management on the profitability of commercial banks in Kenya. Data on the amount of credit, level of non-performing loans and profits were collected for the period 2004 to 2008. The findings revealed that the bulk of the profits of commercial banks are not influenced by the amount of credit and non-performing loans, therefore suggesting that other variables other than credit and non-performing loans impact on profits.

Al-Khouri (2011) has examined the impact of bank's specific risk characteristics, and the overall banking environment on the performance of 43 commercial banks operating in 6 of the Gulf Cooperation Council (GCC) countries over the period 1998-2008. Using fixed effect regression analysis, results showed that credit risk, liquidity risk and capital risk are the major factors that affect bank performance when profitability is measured by return on assets while the only risk that affects profitability when measured by return on equity is liquidity risk.

Kargi (2011) has evaluated the impact of credit risk on the profitability of Nigerian banks. Financial ratios as measures of bank performance and credit risk were collected from the annual reports and accounts of sampled banks from 2004-2008 and analyzed using descriptive, correlation and regression techniques. The findings revealed that credit risk management has a significant impact on the profitability of Nigerian banks. It concluded that banks' profitability is inversely influenced by the levels of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress.

Chen and Pan (2012) have examined the credit risk efficiency of 34 Taiwanese commercial banks over the period 2005-2008. Their study used financial ratio to assess the credit risk and was analyzed using Data Envelopment Analysis (DEA). The credit risk parameters were credit risk technical efficiency (CR-TE), credit risk allocative efficiency (CR-AE), and credit risk cost efficiency (CR-CE). The results indicated that only one bank is efficient in all types of efficiencies over the evaluated periods. Overall, the DEA results show relatively low average efficiency levels in CR-TE, CR-AE and CR-CE in 2008.

Epure and Lafuente (2012) have assessed bank performance in the presence of risk for Costa-Rican banking industry during 1998-2007. The results showed that performance improvements follow regulatory changes and that risk explains differences in banks and non-performing loans negatively affect efficiency and return on assets while the capital adequacy ratio has a positive impact on the net interest margin.

Fredrick (2012) has analyzed the impact of credit risk management on the financial performance of commercial banks in Kenya. The study has used CAMEL model as a proxy for credit risk management. The author found that the strong impact of CAMEL (credit risk components) on the financial performance of commercial banks.

Paudel (2012) has examined the impact of credit risk management on the financial performance of commercial banks in Nepal using the financial report of 31 banks for eleven years (2001-2011). The methods of data analysis in the study were descriptive, correlation and multiple regressions. The financial performance indicator used in the study was return on assets (ROA). The predictors of the banks' financial performance used in the study were: default rate, cost per loan assets and capital adequacy ratio. The author asserts that all these parameters have an inverse impact on banks' financial performance. However, among the risk management indicators, default rate (NPLR) is the single most influencing predictor of bank financial performance in Nepal whereas cost per loan assets is not significant predictors of bank performance. The author concludes that credit risk management is crucial on the bank performance since it have a significant relationship with bank performance.

Abiola and Olausi (2014) have investigated the impact of credit risk management on the performance of commercial banks in Nigeria. Financial reports of seven commercial banking firms were used to analyze for seven years (2005–2011). Panel regression model was employed for the estimation of the model. In the model, return on equity (ROE) and return on assets (ROA) were used as the performance indicators while non-performing loans (NPL) and capital adequacy ratio (CAR) as credit risk management indicators. The study revealed that credit risk management has a significant impact on the profitability of commercial banks' in Nigeria.

Kurawa and Garba (2014) have assessed the effect of credit risk management (CRM) on the profitability of Nigerian banks with a view to discovering the extent to which default rate (DR), cost per loan assets (CLA), and capital adequacy ratio (CAR) influence banks' profitability (ROA). The secondary data from the annual reports and accounts of quoted banks during the period of 2002 to 2011 were used for analysis. The results of the

random-effect generalized least square (GLS) regression techniques reveal that default rate (DR) ratio and cost per loan assets (CLA) ratio have indicated significant positive relationship with the dependent variable, ROA. In respect of the control variable such as LOAN has positive relationship with ROA whereas AGE has negative association with ROA. The authors conclude that credit risk management components have significant positive effect on the profitability of Nigerian banks.

Alshatti (2015) has examined the effect of credit risk management on financial performance of the Jordanian commercial banks during the period 2005-2013 using capital adequacy ratio, credit interest/credit facilities ratio, provision for facilities loss/ net facilities ratio, leverage ratio and non-performing loans/gross loans ratio as independent variables. The dependent variables represent the profitability measured by ROA and ROE. The author concludes that all the credit risk management indicators used in the study have significant effect on the financial performance of the Jordanian commercial banks.

Kodithuwakku (2015) has analyzed the impact of credit risk management on the performance of the commercial banks in Sri Lanka by using both primary and secondary data. The return on assets (ROA) is used as performance indicator and loan provision to total loan (LP/TL), loan provision to non-performing loans (LP/NPL), loan provision to total assets (LP/TA) and non-performing loans/ total loans (NPL/TL) were used as indicators of credit risk. The result shows that non-performing loans and provisions have an adverse impact on the profitability.

Ugoani (2015) has examined the relationship of poor credit risk management and bank failures in Nigeria using survey research design. The results from the Chi-square statistics revealed that weak corporate governance accelerates bank failures and the credit risk management function is to the greatest extent the most diverse and complex activity in banking business. The author concludes that poor credit risk management influences bank failures.

The most of the related empirical studies reported that bank performance is affected by capital adequacy ratio, non-performing loan and cost per loan assets. Moreover, bank performance may be affected the cash reserve ratio and bank size.

III. RESEARCH METHODOLOGY

The sample

This study examines the effect of credit risk on the performance of commercial banks in Nepal over the period of 6 years (2010-2015). The reason behind choosing of the latest six year period is to include the afresh data in the analysis and as the data are from pooling of cross-sectional and time series, thus it seems sufficient to generate data for the analysis. This study has adopted descriptive and causal comparative research design.

The selection of sample size is important for any study and should depend on the purpose of the analysis. Hair, Anderson, Tatham and Black (2006) argue that there should be five observations for each independent variable in the variate (multivariate analysis). Further, they assert that although the minimum ratio is 5 to 1, the desire level is between 15 to 20 observations for each independent variable. When this level is reached, the results should be generalizable if the sample is representative. In view of Hair, Anderson, Tatham and Black (2006), the 77 observations chosen for this study seem adequate sample size because there are five independent variables used   in the estimated regression model. Thus, the selected sample size for the study justifies the minimum sample size required to run the regression model.

The convenience sampling method was used in choosing the banks for the study. Moreover, in selecting the 14 banks for the study, due care is given to include banks such as: joint venture, domestic, best performer, average performer and comparatively week performer in the sample. The banks selected for the study are: Bank of Kathmandu Ltd., Everest Bank Ltd., Machhapuchchhre Bank Ltd., Nabil Bank Ltd., Nepal Bangaladesh Bank Ltd., Nepal Investment Bank Ltd., Nepal SBI Bank Ltd., Sanima Bank Ltd., Siddhartha Bank Ltd., and Sunrise Bank Ltd., Laxmi Bank Ltd., Himalayan Bank Ltd., Standard Chartered Bank Nepal Ltd. and Citizens Bank International Ltd. The selected commercial banks appear fairly represent the study population. The population of this study constitutes the "A" class commercial banks in Nepal which are listed in the Nepalese Stock Exchange.

Data were sourced from the annual reports of the banks in the sample. The data include time-series and cross-sectional data, i.e. pooled data set and estimated the effect of credit risk on the performance of commercial banks using pooled data regression. Data analysis was done using the Statistical Package for Social Sciences (SPSS)-16, computer software.

Study variable and hypothesis

The dependent variables and independent variables used in this study are as follows:

Dependent variable

The measures of bank performance may be varied and the choice of the specific performance measure depends on the objective of the study. In theoretical literature the performance measures could be found such as: traditional measures of performance (ROA - return on assets, ROE - return on equity, cost to income ratio, net interest margin), economic measure of performance (EVA- economic value added, RAROC- risk adjusted return on capital) and market based measure of performance (total share return, price-earnings ratio, price-to-book value, credit default swap). Thus, choice of the best measure of performance is tedious task. Moreover, studying the bank performance concept may generate different results depending on the nature of the stakeholders which analyze the term. If they are depositors, the capacity of banks to manage their savings is the measure of performance; if they are equity-holders, then the performance is reflected in obtaining the satisfied levels of divisible profit and if they are banks' managers, then the performance is considered from profit point of view and also taking into

considerations employees' requests. Such multitude of opinions opens new directions in banking performance research, but this study points out single classical performance indicators: ROA which express the risk taking behavour of bank management in obtaining the satisfied level of profit per unit of total resources. In such a scenario, thus, this study has used ROA as dependent variables to represent bank performance.

ROA measures the profit earned per dollar of assets and reflect how well bank management uses the bank's real investments resources to generate profits (Naceur, 2003 and Alkassim, 2005). For banks with similar business risk profiles, ROA is a useful statistic for comparing the profitability of banks because it avoids distortions that are introduced by differences in financial leverage. Return on assets (ROA) is a comprehensive measure of overall bank performance from an accounting perspective (Sinkey and Joseph, 1992). It seems more suitable for comparing the banks in the same industry than other measures of performance. Thus, return on assets (ROA) is chosen as the performance measure for this study. It shows the effectiveness of management in the utilization of the assets of a commercial bank. It is hypothesized that bank performance is influenced by the credit risk indicators like: capital adequacy ratio, non-performing loan and cost per loan assets with controlling the effect of cash reserve ratio and bank size.

Independent Variables

Capital adequacy ratio

This is an independent variable for the determination of the performance and is considered as the core measure of a bank's financial strength from a regulator's point of view. Capital requirement (capital adequacy) is the amount of capital a bank or other financial institution has to hold as required by its financial regulator. This helps to ensure that institutions are not involving in or holding investments that amplify the risk of default. In addition, to guarantee that financial institutions have enough capital to sustain operating losses while honouring withdrawals.

Basel Committee on banking supervision (1988) has introduced a capital measurement system which is generally referred to as the Basel Accord. This framework has been replaced by new and significantly more complex capital adequacy framework known as Basel II. Whilst Basel II considerably changes the calculation of the risk weights, it sets aside the calculation of capital alone. Basel II is based on a three pillars concept, which helps in boosting stability in the financial system: First pillar-minimum capital requirements (addressing risk), Second pillar- supervisory review and Third pillar- market discipline.

It is a measure of the amount of bank's capital expressed as a percentage of its risk weighted exposure. It consists of the types of financial capital considered the most reliable, primarily shareholders' equity. Theoretically, banks with good capital adequacy ratio have a good profitability. A bank with a strong capital adequacy is also able to absorb possible loan losses and thus avoids bank 'run', insolvency and failure.

Bank capital increases the capacity to raise non-insured debt and thus banks' ability to limit the effect of a drop in deposits on lending (Ashcraft, 2001). Since higher capital

reduces bank risk and creates a buffer against losses, it makes funding with non-insured debt less information sensitive (Admati *et al.*, 2010). Thus, capital adequacy can enhance bank performance. However, empirical studies on the relationship between firms' performance and capital adequacy ratio have shown mixed results.

Jha and   Hui (2012) have found negative association between capital adequacy ratio and ROA and the coefficient was statistically significant (p< 0.05). Gizaw, Kebede and Selvaraj (2015) find that CAR has a significant negative effect on ROE, but not on ROA. Ezike and Oke (2013) mentioned that holding capital beyond the optimal level would inversely affect the efficiency and profitability of commercial banks. Aruwa and Musa (2014), Kurawa and Garba (2014) found significant positive relationship between capital adequacy variable and financial performance of banks. However, Alshatti (2015) found no effect of the capital adequacy ratio on the financial performance of banks. On this basis a positive relationship between capital adequacy ratio and bank's performance is expected and the coefficients to be positive ($\beta_1 > 0$).

H_1: Capital adequacy ratio has a significant and positive effect on bank performance.

Non-performing loan ratio

Non-performing loans ratio (NPLR) reflects the bank's credit quality and is considered as an indicator of credit risk management. NPLR, in particular, indicates how banks manage their credit risk because it defines the proportion of loan losses amount in relation to total loan amount (Hosna *et al,* 2009). NPLR has been used as the default rate on total loan and advances. Gizaw, Kebede and Selvaraj (2015) assert that non-performing loan ratio (NPLR) is the major indicator of commercial banks' credit risk. They finds that NPLR which measures the extent of credit default risk sustained by the banks showed a statistically significant large negative effect on profitability measured by ROA. Since it measures the default rate, a negative relationship could be expected between non-performing loan ratio and financial performance of commercial banks. However, empirical studies produce mixed results. Li and Zou (2014) and Alshatti (2015) found the positive effect of non-performing/ gross loans ratio on the financial performance of banks. Contrary to these findings, Felix and Claudine (2008), Kargi (2011) and Kodithuwakku (2015) found an adverse impact of non-performing loans on the profitability. However, Kithinji (2010) asserted that the bulk of the profits of commercial banks are not influenced by the amount of non-performing loans. Jha and   Hui (2012) found negative association between NPL ratio and ROA but the coefficient is statistically insignificant. Although there are conflicting evidences on this issue, in view of the theory and majority of the empirical literature, a negative relationship is expected between non-performing loan and bank's performance ($\beta_2 < 0$).

H_2: Non-performing loan ratio has a significant and negative effect on bank performance.

Cost per loan assets

Cost per loan assets (CLA) is the average cost per loan advanced to customer in monetary term. Cost per loan assets is calculated dividing total operating costs by total amount of loans. The function of this is to point out efficiency in distributing loans to customers

(Appa, 1996; Ahmed *et al.*, 1998; Kolapo *et al.*, 2012). Thus, cost per loan assets is considered as a determinant of the bank`s performance and is viewed as an indicator of credit risk. Banks that are efficient in managing their expenses (costs), holding other factors constant, earn high profits. Therefore, it is expected that cost per loan assets and bank performance to be negatively associated. This may not always be true because in cases where there are high expenditures due to a lot of businesses done, the bank can still increase the returns. However, the empirical studies show the mixed results on this issue. In Nepalese context, Paudel (2012) has found negative but statistically insignificant association between cost per loan assets (CLA) and bank performance (ROA) but in the Nigerian perspective, Kurawa and Garba (2014) have found significant positive association between cost per loan assets (CLA) ratio and bank's profitability (ROA). In view of theoretical perspective and empirical evidences, a negative relationship is expected between cost per loan assets and bank's performance ($\beta_3 < 0$).

H₃: Cost per loan assets has a significant and negative effect on bank performance.

Cash reserve ratio

Cash reserve ratio is one of the control variable used in analyzing effect of credit risk on the performance of banks. Traditionally, cash reserve ratio (CRR) has been one of the monetary tools in the hands of the central bank. *Cash reserve ratio (CRR)* is a specified minimum fraction of the total deposits of customers which commercial banks have to hold as *reserves* with the central bank. By changing *CRR*, the central bank *can* control the amount of liquidity. If the reserve requirement is raised, banks will have less money to loan out and this effectively reduces the amount of capital in the economy, therefore lowering the money supply. It will mean less money for investment and spending, and would stunt the growth of the economy. It would also mean that banks earn less interest and expect that their profitability may decline. Moreover, cash reserve requirement does not earn *any* income for the commercial banks and thus, may be viewed as a drain on the profitability of banks.

A number of empirical literatures have investigated the link between the changes in cash reserve ratio (CRR) and bank profitability. ABID and LODHI (2015), Maddaloni and Peydro (2011) and Yourougou (1990) have asserted that changes in cash reserve ratio (CRR) have inverse impact banks profitability. However, UREMADU (2012) has found a positive relationship between CRR and banks profitability. Based on the theory and majority of the past empirical evidences, a negative relationship *is expected between cash reserve ratio (CRR) and* bank's performance ($\beta_4 < 0$).

H₄: Cash reserve ratio has a significant and negative effect on bank performance

Bank size

Bank size as measured by total assets is one of the control variables used in analyzing performance of the bank system (Smirlock, 1985). Bank size is generally used to capture potential economies or diseconomies of scale in the banking sector. This variable controls for cost differences in product and risk diversification according to the size of the financial institution. This is included to control for the possibility that large banks are

likely to have greater product and loan diversification. In most finance literature, natural logarithm of total assets of the banks is used as a proxy for bank size. The effect of bank size on profitability is generally expected to be positive (Smirlock, 1985). Likely, a positive relationship between size and bank profitability could be found if there are significant economies of scale (Akhavein et al. 1997; Bourke 1989; Molyneux and Thornton 1992; Bikker and Hu 2002; Goddard et al. 2004). In view of theory and empirical evidences, a positive relationship is expected between bank size and bank's performance ($\beta_5 > 0$).

H_5: Bank size has a significant and positive effect on bank performance.

The model

Pooled data regression model has been used in the analysis. The technique of pooled data estimation takes care of the problem of heterogeneity in the 14 banks selected for the study. The econometric model employed in the study is given as:

$Y = \beta_0 + \beta\ X_{it} + \varepsilon_{it}$

Where: Y is the dependent variable; β_0 is constant; β is the coefficient of explanatory variables; X_{it} is the vector of explanatory variables; and ε_{it} is the error term (assumed to have zero mean and independent across the time period). By adopting the prescribed econometric model, particularly to this study, the impact of credit risk (controlling the effect of cash reserve requirement and bank size) on the performance of the commercial banks has been estimated with the following regression equation:

$ROA_{it} = \beta_0 + \beta_1\ CAR_{it} + \beta_2\ NPLR_{it} + \beta_3\ CLA_{it} + \beta_4\ CRR_{it} + \beta_5\ BS_{it} + e_{it}$

Where:

ROA_{it}	=	Return on assets (ratio of earnings after taxes to total assets) of bank *i* in year *t*
CAR_{it}	=	Capital adequacy ratio of ith bank in year t
$NPLR_{it}$	=	Non-performing loan ratio of ith bank in year t
CLA_{it}	=	Cost per loan assets of ith bank in year t
CRR_{it}	=	Cash reserve ratio of ith bank in year t
BS_{it}	=	Bank size (natural logarithm of total assets) of ith bank in year t
B_0	=	The intercept (constant)
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$	=	The slope which represents the degree with which bank performance changes as the independent variable changes by one unit variable.
e_{it}	=	error component

The selected study variables, their definition, basis of measurement and priori expected sign have been depicted in Table 1.

Table 1: Variables definition, measurement and expected sign

No.	Abbreviation variables	Description	Measurement	Expected sign
1	CAR	Capital adequacy ratio	Tier 1 capital + Tier 2 capital/ Risk weighted Assets	+
2	NPLR	Non-performing loan ratio	Non-performing loan/Gross loans and advances	–
3	CLA	Cost per loan assets	Operating cost/ Total loans assets	–
4	CRR	*Cash reserve ratio*	*Reserves* requirement with the central bank/Total deposits of customers	_
5	BS	Bank size	Natural logarithm of total assets	+

IV.   RESULTS AND DISCUSSION

Descriptive statistics

The summary of the descriptive statistics for all variables used in the study is presented in Table 2. The table reports single bank performance indicator (ROA) and three credit risk indicators which are the capital adequacy ratio, non-performing loan ratio, and cost per loan assets. Moreover, cash reserve ratio and bank size appear as control variables. The result shows that the average value of the bank performance (ROA*)* is 1.669% indicating that during the period 2010-2015, on average, the total assets of sample commercial banks in Nepal generate 1.669% return. The standard deviation of the ROA is 0.789%, which shows the lack of substantial variation.

The minimum capital adequacy ratio is 10.04% that is slightly higher than regulatory requirement of 10% which is the evidence of the compliance of sample banks regarding Nepal Rastra Bank's Directives 2015 and Basel II requirements. However, Table 2 shows that the minimum observation of cash reserve ratio is 3.02% which is lower than regulatory requirement of 6% which can be taken as non-compliance of banks regarding Nepal Rastra Bank's Unified Directives 2015.

Table 2: Descriptive statistics of variables (n =77)

Variable	Scale	Mean	Std. Deviation	Minimum	Maximum	Percentiles		
						25	50	75
Return on assets	Percent	1.669	0.789	0.000	4.010	1.180	1.600	2.190
Capital adequacy ratio	Percent	12.221	2.497	10.040	28.410	11.025	11.520	12.540
Non-performing loan ratio	Percent	1.796	2.212	0.004	17.990	0.620	1.350	2.310
Cost per loan assets	Ratio	0.064	0.037	0.020	0.152	0.030	0.052	0.096
Cash reserve ratio	Percent	14.341	7.992	3.020	34.030	8.465	11.480	19.400
Bank size	Natural logarithm	24.285	0.560	22.703	25.371	23.863	24.345	24.758

Source: Annual report of sample banks and results are drawn from SPSS-16.

The nonperforming loan ratio among the commercial banks in Nepali is varied from 0.004% to 17.990% with the mean and standard deviation 1.796% and 2.212% respectively which indicates a high volatility among the banks' ability in credit risk management. There is also low variation among the banks in cost per loan assets which is evident from low standard deviation of the cost per loan assets which is 0.037.

Correlation analysis

In an effort to analyze the nature of the correlation between the dependent and the independent variables and also to ascertain whether or not multicollinearity exists as a result of the correlation among variables, Pearson correlation analysis have been computed. The correlation matrix that is shown in Table 3 provides some insights into the independent variables that are significantly correlated to the dependent variable ROA. The results indicate that bank performance (ROA) is significantly negatively   correlated with non-performing loan ratio. The result implies that as the value of non-performing loan ratio increases, the performance of banks will decrease. Contrary to the priori expectation, the bank performance (ROA) is significantly positively correlated with cost per loan assets which implies that as the value of cost per loan assets increases, the performance of banks will also increase. As expected there is strong positive relationship between bank size and bank performance (ROA). The result reveals that as size of commercial bank increases, the performance of the bank will increase. However there is negative but insignificant correlation between return on assets and capital adequacy ratio which indicates that the relationship is not strong. Likely, there is negative and insignificant correlation coefficient between cash reserve ratio and return on assets meaning that the relationship is weak.

Table 3: Pearson   correlations analysis of variables (n=77)

Variable	Return on assets	Capital adequacy ratio	Non-performing loan ratio	Cost per loan assets	Cash reserve ratio	Bank size
Return on assets	1					
Capital adequacy ratio	-.073	1				
Non-performing loan ratio	-.284[*]	-.221	1			
Cost per loan assets	.319[**]	-.301[**]	.199	1		
Cash reserve ratio	-.050	.359[**]	.024	-.200	1	
Bank size	.350[**]	-.419[**]	-.196	.209	-.340[**]	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Annual report of sample companies and results are drawn from SPSS-16.

The correlation matrix of the variables presented Table 3 reveals that all correlations coefficients among the independent variables are less than 0.5, implying the absence of multicollinearity. Thus, there is no evidence of presence of multicollinearity among the independent variables.

Regression results

The Table 4 presents the regression results of effect of credit risk on bank performance. The value of R^2 and adjusted R^2 are 0.284; 0.234 respectively. The overall explanatory power of the regression model is fair with R^2 of 0.284. This indicates that 28.4% of the variation in bank performance can be explained by the variation in the explanatory variables. The p-value for F statistics in the model represent that the model is fairly fitted well statistically. As a test of the presence of multicollinearity among independent variables in the model, the tolerance value (TV) and variance inflation factor (VIF) have been computed. The variance inflation factor (VIF) shows a value less than 2 for each variable. The larger the value of VIF, the more troublesome or collinear the variables and as a rule of thumb a VIF greater than 10 is unacceptable (Gujarati, 2004). Thus, VIF less than 2 for each variable indicates the non-presence of multicollinearity. The independent variables chosen for the model are best suited for regression analysis.

Table 4: Regression results of effect of credit risk on bank performance

$ROA_{it} = \beta_0 + \beta_1\ CAR_{it} + \beta_2\ NPLR_{it} + \beta_3\ CLA_{it} + \beta_4\ CRR_{it} + \beta_5\ BS_{it} + e_{it}$

	Coefficients	Std. Error	t	Sig.	Collinearity Statistics	
					Tolerance	VIF
Constant	-8.308	4.362	-1.905	.061		
Capital adequacy ratio	.015	.039	.378	.706	.668	1.496
Non-performing loan ratio	-.105	.040	-2.644	.010	.818	1.223
Cost per loan assets	7.489	2.279	3.286	.002	.863	1.159
Cash reserve ratio	.010	.011	.946	.348	.819	1.222
Bank size	.385	.170	2.272	.026	.695	1.439
	R^2 = .284	Adj. R^2 = .234		F= 5.635	F(sig.) = .000	

Source: Annual report of sample companies and results are drawn from SPSS-16.

The result indicates that, capital adequacy ratio is positive but statistically insignificant. The sign of the coefficient is as usual because theoretically capital adequacy ratio was expected to have a positive relationship with a bank's performance. However, the finding of this study does not support the hypothesis that capital adequacy ratio has a significant effect on bank performance. As expected, there is a strong negative association between non-performing loans (a measure of the default rate) and banks performance. The result is contrary to the findings of Li and Zou (2014) and Alshatti (2015) who found the positive effect of non-performing /gross loans ratio on the financial performance of banks. However, this result is similar to the findings of Achou and Tenguh (2008); Felix and Claudine (2008); Kargi (2011); Epure and Lafuente (2012); and Kodithuwakku (2015) where they found negative association between non-performing loans and banks performance.

However, cost per loan assets has positive and statistically significant impact on bank performance at 1% level of significance. The result is contrary to priori expectation but is consistent with Kurawa and Garba (2014) who found significant and positive relationship between cost per loan assets and bank performance. The result documented different evidence in Nepalese perspective which was not expected but this evidence indicates that

cost per loan assets is the influencing credit risk variable that determines bank performance.

Cash reserve ratio has been used as control variable in the estimated regression model assuming that changes in cash reserve ratio (CRR) have inverse impact banks profitability. Contrary to priori expectation, the result indicates that the coefficient of cash reserve ratio is positive and statistically insignificant. The result of this study reveals that cash reserve ratio does not significantly affect the performance of commercial bank in Nepal.

Bank size (a control variable) has significant positive association with bank performance. The coefficient of bank size is as expected and the result is consistent with findings of Smirlock (1985), Akhavein et al. (1997), Bourke (1989), Molyneux and Thornton (1992), Bikker and Hu (2002) and Goddard et al. (2004) where they found positive association between bank size and bank performance. Moreover, the result of this study indicates that larger Nepalese banks have better performance as compared to smaller one. The possible cause of such result may be that the large banks are likely to have greater product and loan diversification and they have better performance.

The Table 5 summarizes and compares the relationship between expected sign and actual sign with significant level of variables. The results of the regression model reveal that the coefficients of non-performing loan ratio is similar to that of expected signs. However, the coefficient of cost per loan assets is positive which is contrary to priori expectation. The possible cause of such result is that there may be high expenditures due to a lot of businesses done but higher level of prevailing lending interest rates may produce positive effect to the bank performance (ROA) in Nepalese context. The coefficient of bank size is positive and statistically significant which is similar to priori expectation.

Table 5: Relationship between expected sign and actual sign with significant level

Independent variables	Expected sign	Actual sign	Level of significance
Capital adequacy ratio	+	+	*NS*
Non-performing loan ratio	-	-	**
Cost per loan assets	-	+	**
Cash reserve ratio	-	+	*NS*
Bank size	+	+	*

**. Significant at the 0.01 level (2-tailed).

*. Significant at the 0.05 level (2-tailed).

NS indicates not significant

The coefficient of capital adequacy ratio is insignificant meaning that it cannot explain the variation of dependent variable (ROA). Likely, the coefficient of cash reserve ratio is also insignificant which indicates that bank performance is not significantly influenced by the cash reserve ratio in Nepalese context.

V. CONCLUSION

The main purpose of this study is to investigate the impact of credit risk on performance of Nepalese commercial banks. An unbalance panel data of fourteen commercial banks with 77 observations for the period of 2010 to 2015 have been used for the analysis. The regression model revealed that NPL has negative and statistically significant impact on bank performance. Cost per loan assets and bank size have positive and statistically significant impact on bank performance.

The findings of this study indicate that the sampled commercial have poor credit risk management practices. This is evidenced by the insignificant result of 'capital adequacy ratio' and the negative coefficient of 'non-performing loan ratio'. The insignificant result of 'capital adequacy ratio' indicates that capital adequacy ratio could not be regarded as the influencing variable for bank performance. The study reject the hypothesis that Nepalese commercial banks with higher capital adequacy ratio can advance more loans and absorb credit losses whenever they crop up and record better performance because coefficient is negative and insignificant. This finding does not support the regulators' re-capitalization policy for commercial banks. Moreover, the negative coefficient of 'non-performing loan ratio' confirms the negative effect on bank performance. NPLR, in particular, indicates how banks manage their credit risk because it defines the proportion of loan losses amount in relation to total loan amount. All these evidences support that Nepalese commercial banks have poor credit risk management.

This study has found the significant relationship between bank performance and credit risk indicators. The study concludes that 'non-performing loan ratio' has negative effect on bank performance whereas 'cost per loan assets' has positive effect on bank performance. The positive coefficient of cost per loan assets indicates the bank's efficiency in distributing loans to customers and collecting higher level of interest revenue as compare to interest expense and other operating costs. Cost per loan assets is considered to be the influencing variable to enhance banks' performance. In addition to

credit risk indicators, bank performance is also affected by its size. As a whole, Nepalese commercial banks have poor credit risk management. Thus, these banks need to follow prudent credit risk management and safeguarding the assets of the banks and protect the interests of the stakeholders.

VI. POLICY IMPLICATIONS AND RESEARCH AVENUES

Based on the findings from the empirical analysis, the study offers the following recommendations through which they can work to improve credit risk management and to have an effective role in achieving better performance (ROA).

The negative coefficient of 'non-performing loan ratio' with bank performance indicates that there is higher level of loan loss provision charged against profit and eventually leads to reduce performance (ROA). Thus, Nepalese commercial banks should strictly follow the prevailing NRB Directive as well as Basel II Accord while managing credit risk. Compliance with the Basel II Accord means a sound approach to tackling credit risk and this ultimately improves bank performance.

Cost per loan assets (CLA) coefficient exerts most significant positive effect on the performance across the banking firms. Based on the findings of this study, it is recommended that banks in Nepal should enhance their capacity in credit analysis and loan administration while the regulatory authority should pay more attention to banks' compliance to relevant directives and prevailing rules and regulations.

Banks need to place and devise strategies that will not only limit the banks exposition to credit risk but will develop performance and competitiveness of the banks, and banks should establish a proper credit risk management strategies by conducting sound credit evaluation before granting loans to customers. It is recommended that bank's credit-granting activities conform to the established strategy that written procedures should be developed and implemented, and that loan approval and review responsibilities are clearly and properly assigned. Senior management must also ensure that there is a periodic independent internal assessment of the bank credit-granting and management functions. The result in this study therefore, suggested the need for strong credit risk and loan service process management must be adopted to keep the level of NPL as low as possible which will enable to maintain the high performance (profitability) of commercial banks in Nepal.

Further, this study is also hoped to be useful to academicians as a source of knowledge for further research. The study is concentrated on only three factors and thus, further study should be carried out on the topic to point out the other factors that enhance mitigation of credit risk to improve performance of Nepalese commercial banks.

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Appendix 1

Banks selected for the study including study period and observations

S.N.	Name of the bank	Study period	Observations
1	Nepal Investment Bank Ltd.	2010 - 2015	6
2	Nabil Bank Ltd.	2010- 2014	5
3	Nepal SBI Bank Ltd.	2010- 2015	6
4	Everest Bank Ltd.	2010- 2015	6
5	Bank of Kathmandu Ltd.	2010- 2014	5
6	Nepal Bangladesh Bank Ltd.	2010- 2014	5
7	Machhapuchchhre Bank Ltd.	2010- 2014	5
8	Siddhartha Bank Ltd.	2010- 2015	6
9	Sunrise Bank Ltd.	2010- 2015	6
10	Sanima Bank Ltd.	2010- 2015	6
11	Laxmi Bank Ltd.	2010- 2015	6
12	Himalayan Bank Ltd.	2010- 2014	5
13	Standard Chartered Bank Nepal Ltd.	2010- 2014	5
14	Citizens Bank International Ltd.	2010- 2014	5
	Total		**77**

Appendix 2

Data of the banks selected for the study

Bank	Fiscal Year	ROA(%)	CAR(%)	NPLR(%)	CLA (Ratio)	CRR(%)	BS (LnTA)
Nepal Investment Bank Ltd.	FY 2009-10	2.200	10.550	0.670	0.083	7.800	24.772
Nepal Investment Bank Ltd.	FY 2010-11	2.000	10.910	0.940	0.114	7.700	24.790
Nepal Investment Bank Ltd.	FY 2011-12	1.600	11.100	3.320	0.129	13.600	24.909
Nepal Investment Bank Ltd.	FY 2012-13	2.600	11.490	1.910	0.100	16.000	25.016
Nepal Investment Bank Ltd.	FY 2013-14	2.300	11.270	1.770	0.078	19.200	25.180
Nepal Investment Bank Ltd.	FY 2014-15	1.900	11.900	1.250	0.025	12.000	25.371
Nabil Bank Ltd.	FY 2009-10	2.380	10.500	1.480	0.094	3.020	24.676
Nabil Bank Ltd.	FY 2010-11	2.430	10.580	1.770	0.103	4.900	24.786
Nabil Bank Ltd.	FY 2011-12	2.800	11.010	2.330	0.108	8.600	24.870
Nabil Bank Ltd.	FY 2012-13	3.250	11.590	2.130	0.072	9.320	25.017
Nabil Bank Ltd.	FY 2013-14	2.890	11.240	2.230	0.061	11.320	25.192
Nepal SBI Bank	FY 2009-10	1.030	12.250	1.480	0.113	9.030	24.362
Nepal SBI Bank	FY 2010-11	1.010	11.520	1.100	0.133	7.000	24.554
Nepal SBI Bank	FY 2011-12	0.830	11.210	0.540	0.137	8.330	24.785
Nepal SBI Bank	FY 2012-13	1.190	12.390	0.370	0.122	9.580	24.895
Nepal SBI Bank	FY 2013-14	1.510	13.280	0.260	0.093	9.320	24.835
Nepal SBI Bank	FY 2014-15	1.800	14.030	0.190	0.030	10.920	24.805
Everest Bank Ltd.	FY 2009-10	2.090	10.770	0.160	0.081	15.530	24.446
Everest Bank Ltd.	FY 2010-11	2.100	10.430	0.340	0.107	9.550	24.557
Everest Bank Ltd.	FY 2011-12	2.110	11.020	0.840	0.110	17.220	24.745
Everest Bank Ltd.	FY 2012-13	2.390	11.590	0.620	0.075	15.190	24.909
Everest Bank Ltd.	FY 2013-14	2.250	11.310	0.970	0.073	16.910	24.978
Everest Bank Ltd.	FY 2014-15	1.850	13.330	0.660	0.026	24.270	25.320
Bank of Kathmandu	FY 2009-10	2.180	10.850	1.520	0.089	8.320	23.876
Bank of Kathmandu	FY 2010-11	2.440	11.610	1.820	0.106	8.100	23.932
Bank of Kathmandu	FY 2011-12	2.100	11.070	2.300	0.114	8.720	24.086
Bank of Kathmandu	FY 2012-13	1.900	12.570	1.500	0.087	9.410	24.206
Bank of Kathmandu	FY 2013-14	0.650	11.570	1.060	0.095	6.820	24.335
Nepal Bangladesh Bank ltd	FY 2009-10	0.000	10.190	17.990	0.115	13.580	23.251
Nepal Bangladesh Bank ltd	FY 2010-11	4.010	11.860	4.290	0.152	24.150	23.363
Nepal Bangladesh Bank ltd	FY 2011-12	3.570	11.610	1.330	0.143	21.010	23.727
Nepal Bangladesh Bank ltd	FY 2012-13	2.400	11.440	1.350	0.112	22.900	23.805
Nepal Bangladesh Bank ltd	FY 2013-14	2.060	11.310	1.330	0.097	15.240	24.153
Machahapurche Bank	FY 2009-10	0.350	11.240	2.320	0.050	5.890	23.752
Machahapurche Bank	FY 2010-11	0.050	10.850	4.170	0.031	5.890	23.699
Machahapurche Bank	FY 2011-12	0.160	15.040	2.840	0.039	15.340	23.916
Machahapurche Bank	FY 2012-13	0.490	12.540	2.840	0.029	11.060	24.134
Machahapurche Bank	FY 2013-14	1.120	10.630	1.780	0.050	9.240	24.430
Siddarth bank Ltd.	FY 2009-10	1.060	10.040	0.530	0.021	5.660	23.850
Siddarth bank Ltd.	FY 2010-11	1.280	10.780	0.790	0.025	5.610	23.918
Siddarth bank Ltd.	FY 2011-12	1.120	11.030	1.520	0.033	11.860	24.112
Siddarth bank Ltd.	FY 2012-13	1.430	11.800	2.390	0.036	9.600	24.241
Siddarth bank Ltd.	FY 2013-14	1.740	11.390	2.750	0.041	17.220	24.420
Siddarth bank Ltd.	FY 2014-15	1.510	11.100	1.800	0.029	8.630	24.648
Sunrise bank Ltd.	FY 2009-10	1.210	11.370	1.000	0.034	24.200	23.552
Sunrise bank Ltd.	FY 2010-11	0.280	13.280	3.510	0.063	24.320	23.486
Sunrise bank Ltd.	FY 2011-12	0.520	11.780	3.520	0.053	32.400	23.781
Sunrise bank Ltd.	FY 2012-13	1.190	11.800	3.740	0.052	33.510	23.986
Sunrise bank Ltd.	FY 2013-14	0.830	11.490	4.940	0.055	34.030	24.113
Sunrise bank Ltd.	FY 2014-15	1.260	11.110	2.900	0.041	30.700	24.345
Sanima bank Ltd.	FY 2009-10	1.180	16.510	0.080	0.024	28.190	22.703
Sanima bank Ltd.	FY 2010-11	1.660	28.410	0.004	0.024	26.570	22.960
Sanima bank Ltd.	FY 2011-12	0.890	20.740	0.480	0.030	30.240	23.342
Sanima bank Ltd.	FY 2012-13	1.390	14.870	0.030	0.021	30.960	23.813

Bank	Fiscal Year	ROA(%)	CAR(%)	NPLR(%)	CLA (Ratio)	CRR(%)	BS (LnTA)
Sanima bank Ltd.	FY 2013-14	1.460	12.540	0.020	0.021	26.680	24.103
Sanima bank Ltd.	FY 2014-15	1.550	11.080	0.070	0.020	22.320	24.420
Laxmi bank Ltd.	FY 2009-10	1.660	13.710	0.120	0.020	7.240	23.766
Laxmi bank Ltd.	FY 2010-11	1.760	11.630	0.900	0.022	9.220	23.794
Laxmi bank Ltd.	FY 2011-12	1.500	11.020	0.620	0.025	19.600	23.982
Laxmi bank Ltd.	FY 2012-13	1.500	12.230	1.510	0.127	12.330	24.118
Laxmi bank Ltd.	FY 2013-14	1.470	11.910	1.150	0.025	18.280	24.276
Laxmi bank Ltd.	FY 2014-15	1.040	10.810	1.300	0.027	12.590	24.537
Himalayan bank Ltd.	FY 2009-10	1.190	10.720	3.520	0.056	6.760	24.478
Himalayan bank Ltd.	FY 2010-11	1.910	10.680	4.220	0.050	5.750	24.568
Himalayan bank Ltd.	FY 2011-12	1.760	11.020	2.090	0.053	8.720	24.719
Himalayan bank Ltd.	FY 2012-13	1.540	11.550	2.890	0.060	6.080	24.836
Himalayan bank Ltd.	FY 2013-14	1.300	11.230	1.960	0.061	8.720	25.022
Standard Chartered Bank	FY 2009-10	2.700	14.510	0.610	0.043	6.740	24.417
Standard Chartered Bank	FY 2010-11	2.550	14.220	0.620	0.041	6.100	24.503
Standard Chartered Bank	FY 2011-12	2.800	13.930	0.780	0.048	22.400	24.453
Standard Chartered Bank	FY 2012-13	2.670	12.540	0.770	0.040	16.430	24.544
Standard Chartered Bank	FY 2013-14	2.510	12.270	0.480	0.036	21.180	24.700
Citizens Bank International Ltd	FY 2009-10	1.170	11.400	0.310	0.023	9.040	23.528
Citizens Bank International Ltd	FY 2010-11	1.180	15.540	1.170	0.030	10.130	23.546
Citizens Bank International Ltd	FY 2011-12	1.220	14.470	2.010	0.031	17.530	23.722
Citizens Bank International Ltd	FY 2012-13	1.790	11.890	2.010	0.040	13.240	23.981
Citizens Bank International Ltd	FY 2013-14	1.710	12.990	3.400	0.044	11.480	24.196

Source: Annual reports of sample banks and excel software