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Impact of Financial Distress on the Financial Sustainability of Nepalese Commercial Banks

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Abstract

This study examines the impact of financial distress on the financial sustainability of Nepalese commercial banks. Return on assets, return on equity, and bank stability as the dependent variables. The selected independent variables were liquidity ratio, non-performing loan ratio, capital adequacy ratio, efficiency, gross domestic product and inflation as the independent variables. This study is based on secondary data of 27 commercial banks with 216 observations for the period from 2011/12 to 2018/19. The data were collected from the Banking and Financial Statistics, Quarterly Economic Bulletin published by Nepal Rastra Bank, and annual reports of the selected commercial banks. The regression models are estimated to test the impact of financial distress on the financial sustainability of Nepalese commercial banks. The study showed that gross domestic product has a positive impact on return on assets. It indicates that an increase in gross domestic product leads to an increase in return on assets. The study also showed that the capital adequacy ratio has a positive impact on return on assets. It reveals that higher the capital adequacy ratio, the higher the return on assets. Likewise, the inflation rate has a negative impact on return on assets. It indicates that higher the inflation rate, lower would be the return on assets. However, efficiency ratio has a negative impact on return on assets. It reveals that increase in cost to income ratio leads to decrease in return on assets. Likewise, non-performing loan has a negative impact on return on assets. It means that increase in non-performing loans leads to decrease in return on assets. In contrast, efficiency ratio has a negative impact on return on equity and bank stability. It reveals that an increase in the cost-to-income ratio leads to a decrease in return on equity and bank stability. Moreover, the liquidity ratio has a negative impact on return on equity. It means that the higher the liquidity ratio, the lower the return on equity. Likewise, non-performing loans have a negative impact on return on equity and bank stability. It means that an increase in non-performing loans leads to a decrease in return on equity and bank stability. Moreover, gross domestic product has a positive impact on return on equity and bank stability. It indicates

that an increase in gross domestic product leads to an increase in return on equity and bank stability.

Keywords: financial sustainability, return equity, bank stability, liquidity ratio, capital adequacy ratio, non-performing loan, efficiency, inflation.

Impact of Financial Distress on the Financial Sustainability of Nepalese Commercial Banks

Introduction

The financial soundness of a country depends on a robust financial system that comprises a set of financial institutions, efficient financial markets, and customer-centric financial services. The nature and extent of financial crisis in the financial system depend on understanding the impact and likelihood of systemic risk (Allen et al 2010). Strong financial institutions are critical for increased investment, economic growth, employment, and poverty alleviation. The key component in the financial system is banks, which work as intermediaries between fund providers and those in need of funds, contributing to economic growth. Banks play a significant role in the implementation of monetary policy of a country. Thus, profitable banks will ensure the continuity of economic growth as well as the stability of the financial system. Therefore, the banking sector financial services play a vital role in the economic growth and development of a country (Kenourgios & Samitas, 2009).

When an institution is plagued by financial, managerial, and operational malfunctions, it is said to be in financial distress (Meher & Getaneh, 2019). The financial institutions are engulfed in financial distress when they are involved in unethical business practices, facing a shortage of adequate capital and a meager deposit base. Thus, low financial distress is an indication of better financial performance of the banks. Hill *et al.* (2012) noted that the financial performance of a bank is influenced by variables of financial distress, such as liquidity, size, and leverage, etc. Khalid (2017) has divided the variables of financial distress into a firm's specific and external factors of a country. Meher and Getaneh (2019) considered return on assets and bank failure as the indicators of short-term financial position, while the financial stability index and solvency risk were

used to assess the long-term financial position. The financial sustainability of banks has a critical implication for the economic well-being of any nation. It is generally considered to be the reflector of financial and economic conditions of a country, other than its intermediation role in an economy (Ongore & Kusa, 2013). Al-Shawabkeh and Kanungo (2017) posited that the sustainability of a banking system could be improved by reassessing credit risks and improved decision making by the managers.

Mathuva (2009) examined the relationship between capital adequacy, cost-income ratio, and the profitability of Kenyan commercial banks. The study concluded that the cost-income ratio is negative and strongly significant with profitability measures, indicating that more efficient banks generate higher profits. Rupeika-Apoga, et al. (2018) examined the bank stability of Nordic and non-Nordic banks in Latvia. The study found that the efficiency ratio has a significant negative impact on bank stability. Further, Petria *et al.* (2015) assessed the determinants of banks' profitability in the EU 27 banking systems. The study reported that the cost-to-income ratio has a negative and significant impact on ROA and ROE. Izhar and Mehmat (2007) investigated the determinants of profitability of Islamic banks in Indonesia. The study reported that inflation has a significantly positive impact on the profitability of Indonesian Islamic banks. Tan and Floros (2012) examined the effect of GDP growth on bank profitability in China. The study concluded that cost efficiency is positively related to bank profitability. In addition, the study also found that there is a negative relationship between GDP growth and bank profitability. Similarly, Kiganda (2014) reported that macroeconomic factors (real GDP, inflation, and exchange rate) have a positive effect on bank profitability. Chioma, et al. (2015) revealed that there is a positive relationship between inflation, banks' performance, and the investment decision of commercial banks operating in Nigeria. Further, Ishfaq and Khan (2015) investigated the impact of internal and external factors and macroeconomic variables on profitability of commercial banks of Pakistan. The study found that liquidity ratio, non-performing loan ratio, capital adequacy ratio, cost-to-income

ratio, GDP, and inflation have a significant impact on bank profitability.

Alshatti (2015) revealed that there is a positive effect of liquidity management on the profitability of Jordanian commercial banks. The study also found that the increase in the quick ratio and investment ratio leads to an increase in bank profitability. Likewise, Lartey *et al.* (2013) reported a weak positive relationship between profitability and liquidity. Ghenimi *et al.* (2017) reported that credit risk has a significant and negative impact on bank stability. Furthermore, My (2020) found that credit risk measured by non-performing loans has a negative relationship with bank stability of Vietnam commercial banks. Torbira and Zaagha (2016) found that the capital adequacy ratio for banks is one of the most important indicators of the financial solvency of the financial sector. It is considered a safety valve to protect the depositors and promote stability and efficiency in the banking system and financial institutions. Similarly, Ezike and Oke (2013) concluded that capital adequacy measured by shareholders' fund exerts a positive influence on banks' return on assets, earnings per share, loans and advances, and credit risk.

Abuzar (2013) found that cost, liquidity, and size of the bank have positive and significant impact on bank profitability. However, external macroeconomic factors are classified as redundant and have no significant impact on bank profitability. Moreover, Zeitun (2012) found that the cost-to-income ratio has a negative and significant impact on Islamic and conventional banks' performance. Further, the study reported that GDP is positively correlated to banks' profitability, while inflation is negatively correlated to banks' profitability. Moreover, Ranga (2012) analyzed the impact of minimum capital requirements on commercial banks' performance in Zimbabwe. The study revealed a significant positive relationship between commercial banks' capitalization and their performance. Cihak and Hesse (2010) employed the Z-score as a stability indicator for 77 Islamic banks across the world over the period 1993-2004. The study found that the efficiency ratio has a negative and significant correlation with bank stability. Moreover, larger-sized banks were found to be more stable and less risky.

In the context of Nepal, Gnawali (2018) found that there is a negative

impact of non-performing loans on return on assets and return on equity in the context of Nepalese government banks. Similarly, there is a negative relationship between non-performing loans and return on equity (ROE). Likewise, Bhattarai (2019) reported that there is a negative relationship between NPL and the efficiency and stability of banks. Furthermore, Poudel (2018) stated that solvency ratio, interest spread rate, and inflation have an insignificant negative impact on profitability. However, capital adequacy ratio, total assets, and GDP growth have a significant positive impact on the profitability of commercial banks in Nepal. Sherpa *et al.* (2019) concluded that there is a positive relationship between bank size and bank stability. However, inflation has a negative relationship with bank stability. Koju *et al.* (2018) showed that NPL has a significant positive relationship with the export-to-import ratio, inefficiency, and asset size. Similarly, the study also showed a negative relationship of NPL with the GDP growth rate, capital adequacy, and inflation rate.

Bhatta *et al.* (2019) analyzed the impact of deposit rate, lending rate, asset quality, and liquidity on the financial performance of Nepalese commercial banks. The study showed that firm size is positively related to the performance of commercial banks. Moreover, liquidity, GDP, and inflation are negatively related to the financial performance of Nepalese commercial banks. Further, Bajagai *et al.* (2019) examined the effect of credit risk, liquidity risk, and market risk on profitability of Nepalese commercial banks from 2011 to 2017. The study concluded that there is a negative relationship between non-performing loans and capital adequacy ratio with return on equity. However, firm size has a positive relationship with return on equity. Mainali *et al.* (2020) analyzed the impact of economic openness and inflation on the profitability of Nepalese commercial banks during the period of 2012 to 2018. The study found that bank size has a positive impact on return on assets. Similarly, the study reported that inflation has a negative impact on return on assets.

The literature discussed here shows empirical evidence of the impact of financial distress on the financial sustainability of commercial banks. Though

there are the above-mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted. The major objective of the study is to examine the impact of financial distress on the financial sustainability of Nepalese commercial banks. More specifically, it examines the relationship of liquidity ratio, non-performing loan ratio, capital adequacy ratio, cost-to-income ratio, GDP, and inflation with return on assets, return on equity, and bank stability of Nepalese commercial banks.

Methodology

The study is based on the secondary data, which were gathered from 27 Nepalese commercial banks from 2011/12 to 2018/19, leading to a total of 216 observations. The main sources of data include Banking and Financial Statistics, Quarterly Economic Bulletin published by Nepal Rastra Bank, and annual reports of the selected commercial banks. Table 1 shows the list of commercial banks selected for the study, along with the study period and number of observations.

Table 1

List of commercial banks selected for the study along with study period and number of observations

S.N.	Name of the banks	Study period	Observations
1	Agricultural Development Bank Limited	2011/12-2018/19	8
2	Bank of Kathmandu Limited	2011/12-2018/19	8
3	Century Commercial Bank Limited	2011/12-2018/19	8
4	Citizens Bank International Limited	2011/12-2018/19	8
5	Civil Bank Limited	2011/12-2018/19	8
6	Everest Bank Limited	2011/12-2018/19	8
7	Global IME Bank Limited	2011/12-2018/19	8
8	Himalayan Bank Limited	2011/12-2018/19	8
9	Kumari Bank Limited	2011/12-2018/19	8
10	Laxmi Bank Limited	2011/12-2018/19	8

11	Machhapuchchhre Bank Limited	2011/12-2018/19	8
12	Mega Bank Nepal Limited	2011/12-2018/19	8
13	Nabil Bank Limited	2011/12-2018/19	8
14	Nepal Bangladesh Bank Limited	2011/12-2018/19	8
15	Nepal Bank Limited	2011/12-2018/19	8
16	Nepal Credit and Commerce Bank Limited	2011/12-2018/19	8
17	Nepal Investment Bank Limited	2011/12-2018/19	8
18	Nepal SBI Bank Limited	2011/12-2018/19	8
19	NIC Asia Bank Limited	2011/12-2018/19	8
20	NMB Bank Limited	2011/12-2018/19	8
21	Prabhu Bank Limited	2011/12-2018/19	8
22	Prime Commercial Bank Limited	2011/12-2018/19	8
23	Rastriya Banijya Bank Limited	2011/12-2018/19	8
24	Sanima Bank Limited	2011/12-2018/19	8
25	Siddhartha Bank Limited	2011/12-2018/19	8
26	Standard Chartered Bank Nepal Limited	2011/12-2018/19	8
27	Sunrise Bank Limited	2011/12-2018/19	8
Total number of observations			216

The Model

The model used in this study assumes that financial sustainability depends upon financial distress. The dependent variables selected for the study are return on assets, return on equity, and bank stability. The selected independent variables are liquidity ratio, non-performing loan ratio, capital adequacy ratio, cost-to-income ratio, GDP, and inflation. Therefore, the model used in this study takes the following form:

$$ROA_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 NPL_{it} + \beta_3 CAR_{it} + \beta_4 EFF_{it} + \beta_5 GDP_t + \beta_6 INF_t + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 NPL_{it} + \beta_3 CAR_{it} + \beta_4 EFF_{it} + \beta_5 GDP_t + \beta_6 INF_t + e_{it}$$

$$Z_STAB_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 NPL_{it} + \beta_3 CAR_{it} + \beta_4 EFF_{it} + \beta_5 GDP_t + \beta_6 INF_t + e_{it}$$

Where,

ROA = Return on assets is measured by the ratio of net income to total assets, in percentage.

ROE = Return on equity is measured by the ratio of net income to total equity, in percentage.

Z_STAB = Bank stability is measured by Z-score, in percentage.

LR = Liquidity ratio is measured by the ratio of total loans to total deposits, in percentage.

NPL = Non-performing loan ratio is measured by the ratio of non-performing loans to total loans, in percentage.

CAR = Capital adequacy ratio is measured by the ratio of Tier I capital + Tier II capital to total risk-weighted assets, in percentage.

EFF = Efficiency is measured by the ratio of cost to income ratio, in percentage.

GDP = Gross domestic product is measured by nominal GDP, Rs in millions.

INF = Inflation is measured by the change in the consumer price index, in percentage.

The following section describes the independent variables used in this study along with hypothesis formulation.

Liquidity Ratio

SahutandMili (2011) defined liquidity as the ability of banks to pay short-term obligations. Rostami (2015) reported a negative impact of liquidity ratio on financial performance. Makkar and Hardeep (2018) found that the liquid assets to total assets ratio is negatively related to the profitability of the banks, as the banks holding a large amount of cash and cash equivalents have less amount of money for long-term investment. In addition, Demirguc-Kunt and Huizinga (2001) found a significant negative relationship between liquidity and profitability. This finding is consistent with the findings of Molyneux and Thornton (1992). Ali and Puah (2018) found that liquidity risk and financial crisis has a negative impact on bank stability. Likewise, Adusei (2015) reported that there is a positive impact of liquidity risk on bank stability. Based on it, this study develops the following hypothesis:

H1: There is a negative relationship between the liquidity ratio and financial sustainability.

Non-performing Loan Ratio

Non-performing loans are loans that are outstanding in both principal and interest for a long time, contrary to the terms and conditions contained in the loan contract (Afza & Nazir, 2009). Teshome et al (2018) found that NPL has a significant negative impact on bank performance and liquidity. Bawaneh and Dahiyat (2019) reported an insignificant negative impact of asset quality on the financial performance of commercial banks. Likewise, Makkar and Hardeep (2018) found that non-performing loans have a negative impact on ROA. Alhadab and Alsahawneh (2016) reported that the loan loss provision and non-performing loans have a negative impact on the profitability of Jordanian commercial banks. Furthermore, Koskei (2020) reported that non-performing loans have a negative and statistically significant relationship with banks' financial stability measured by Z-score. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship of non-performing loan ratio with financial sustainability.

Capital Adequacy Ratio

Onaolapo and Olufemi (2012) reported that there is a positive and significant relationship between capital adequacy ratio and return on assets. According to Nelson (2020), the capital adequacy ratio has a positive impact on return on assets. Olatayo et al. (2019) found that there exists a strong positive relationship between capital adequacy ratio and return on assets of Deposit Money Banks (DMB) in Nigeria. Furthermore, Salami (2018) revealed that the core capital ratio has a positive impact on a bank's Z-score. Akinleye and Fajuyagbe (2019) examined the effect of capital adequacy on the financial performance of banks in Nigeria. The study concluded that there is a positive relationship between the capital adequacy ratio and financial performance. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship of capital adequacy ratio with financial sustainability.

Efficiency

Operational risk exposures threaten the financial stability and performance of banking sector. Rupeika-Apoga et al. (2018) found that the efficiency ratio has a significant negative impact on banks' stability. Further, Petria *et al.* (2015) reported that the cost-to-income ratio has a negative and significant impact on ROA and ROE. Salami (2018) found that there is a negative relationship between operational inefficiency and the profitability of banks. Muriithi and Muigai (2017) reported that there is a negative association between the cost-to-income ratio and the profitability and stability of banks. Cost to income ratio has negative and significant impact on ROA and ROE (Dietrich & Wanzenried, 2011; Knezevic & Dobromirov, 2016; Trujillo-Ponce, 2013). Antwi (2019) also found that cost-to-income has a significant negative relationship with ROA and ROE. Based on it, this study develops the following hypothesis:

H4: There is a negative relationship between efficiency and financial sustainability.

Gross Domestic Product

Rupeika-Apoga et al. (2018) found that GDP growth has a significant positive impact on bank's stability. Similarly, Hamza and Khan (2014) found that there is a positive and significant relationship between GDP and profitability of banks. Simiyu and Ngile (2015) found that real GDP growth rate has a positive but insignificant effect on the ROA in the context of Nairobi. Moreover, Masood and Ashraf (2012) showed that real GDP has a positive effect on ROE. Further, Kosmidou *et al.* (2006) concluded that there is a positive relationship between GDP growth and stability of banks. Based on it, this study develops the following hypothesis:

H5: There is a positive relationship of GDP with financial sustainability.

Inflation

Boyd *et al.* (2001) showed that there is a significant and negative

relationship between inflation and performance of the banking sector. According to Barro (1995), there is a negative association of inflation with economic growth and bank profitability. In addition, Huybens and Smith (1999) argued that an increase in the rate of inflation has negative consequences on banking financial sector performance through credit market frictions. Similarly, Chioma, et al. (2015) found that there is a negative and insignificant relationship between inflation and bank profitability. Bhatta *et al.* (2019) analyzed the impact of deposit rate, lending rate, asset quality, and liquidity on the financial performance of Nepalese commercial banks. The study showed that liquidity, GDP, and inflation are negatively related to the financial performance of Nepalese commercial banks. Based on it, this study develops the following hypothesis:

H6: There is a positive relationship between inflation and financial sustainability.

Results and Discussion

Descriptive Statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2011/12 to 2018/19.

Table 2

Descriptive Statistics

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	-3.43	4.01	1.56	0.80
ROE	-55.94	55.31	15.11	8.75
Z_STAB	-5.79	72.75	15.57	6.26
LR	46.08	105.72	80.06	10.64
NPL	0.00	24.29	1.99	2.35
CAR	-18.73	41.82	12.87	4.28
EFF	15.01	100.78	43.17	13.97
GDP	1527344	3464319	2342506.75	667877.77
INF	4.20	9.90	7.21	2.30

Source: SPSS output

Table 2 shows the descriptive statistics of dependent and independent variables of 27 Nepalese commercial banks for the study period from 2011/12

to 2018/19. The dependent variables are ROA (Return on assets is measured by the ratio of net income to total assets, in percentage), ROE (Return on equity is measured by the ratio of net income to total equity, in percentage) and Z_STAB (Bank stability is measured by Z-score, in percentage). The independent variables are LR (Liquidity ratio is measured by the ratio of total loans to total deposits, in percentage), NPL (Non-performing loan ratio is measured by the ratio of non-performing loan to total loans, in percentage), CAR (Capital adequacy ratio is measured by the ratio of Tier I capital + Tier II capital to total risk weighted assets, in percentage), EFF (Efficiency is measured by the ratio of cost to income ratio, in percentage), GDP (Gross domestic product is measured by nominal GDP, Rs in millions) and INF (Inflation is measured by change in consumer price index, in percentage).

Correlation Analysis

Having indicated the descriptive statistics, Pearson's correlation coefficient was/ or has been computed, and the results are presented in Table 3.

Table 3

Pearson's Correlation Coefficients Matrix

Variables	ROA	ROE	Z_STAB	LR	NPL	CAR	EFF	GDP	INF
ROA	1								
ROE	0.705**	1							
Z_STAB	0.363**	0.013	1						
LR	0.011	-0.209**	0.479**	1					
NPL	-0.338**	-0.371**	-0.224**	-0.239**	1				
CAR	0.050	-0.112	0.548**	0.467**	-0.312**	1			
EFF	-0.105	-0.112	-0.217**	-0.174*	0.424**	-0.238**	1		
GDP	0.195**	0.004	0.331**	0.554**	-0.174*	0.205**	-0.053	1	
INF	-0.145*	0.067	-0.303**	-0.466**	0.154*	-0.227**	-0.028	-0.808**	1

Table 3 shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 27 Nepalese commercial banks for the study period of 2011/12 to 2018/19. The dependent variables are ROA (Return on assets is measured by the ratio of net income to total assets, in percentage),

ROE (Return on equity is measured by the ratio of net income to total equity, in percentage), and Z_STAB (Bank stability is measured by Z-score, in percentage). The independent variables are LR (Liquidity ratio is measured by the ratio of total loans to total deposits, in percentage), NPL (Non-performing loan ratio is measured by the ratio of non-performing loan to total loans, in percentage), CAR (Capital adequacy ratio is measured by the ratio of Tier I capital + Tier II capital to total risk weighted assets, in percentage), EFF (Efficiency is measured by the ratio of cost to income ratio, in percentage), GDP (Gross domestic product is measured by nominal GDP, Rs in millions) and INF (Inflation is measured by change in consumer price index, in percentage).

*Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels, respectively.*

Table 3 shows that gross domestic product is positively correlated to return on assets. It indicates that an increase in gross domestic product leads to an increase in return on assets. The study also shows that the capital adequacy ratio is positively correlated to return on assets. It reveals that the higher the capital adequacy ratio, the higher the return on assets. Likewise, the inflation rate is negatively correlated with return on assets. It indicates that the higher the inflation rate, the lower the return on assets. However, the efficiency ratio has a negative relationship with return on assets. It reveals that an increase in the cost-to-income ratio leads to a decrease in return on assets. In contrast, the liquidity ratio is positively correlated with return on assets. It means that the higher the liquidity ratio, the higher the return on assets. Likewise, there is a negative relationship between non-performing loans and return on assets. It means that an increase in non-performing loans leads to a decrease in return on assets.

Similarly, the capital adequacy ratio is negatively correlated to return on equity. It reveals that the higher the capital adequacy ratio, the lower the return on equity. However, the efficiency ratio has a negative relationship with return on equity. It reveals that an increase in the cost-to-income ratio leads to a decrease in return on equity. In contrast, the liquidity ratio is negatively correlated to return

on equity. It means that the higher the liquidity ratio, the lower the return on equity. Likewise, there is a negative relationship between non-performing loans and return on equity. It means that an increase in non-performing loans leads to a decrease in return on equity. Moreover, gross domestic product is positively correlated to return on equity. It indicates that an increase in gross domestic product leads to an increase in return on equity.

Likewise, the result also shows that gross domestic product is positively correlated with bank stability. It indicates that an increase in gross domestic product leads to an increase in bank stability. The study also shows that the capital adequacy ratio is positively correlated to bank stability. It reveals that the higher the capital adequacy ratio, the higher the bank stability. Likewise, the inflation rate is negatively correlated to bank stability. It indicates that the higher the inflation rate, the lower the bank stability. However, the efficiency ratio has a negative relationship with bank stability. It reveals that an increase in the cost-to-income ratio leads to a decrease in bank stability. In contrast, the liquidity ratio is positively correlated with bank stability. It means that the higher the liquidity ratio, the higher the bank stability. Likewise, there is a negative relationship between non-performing loans and bank stability. It means that an increase in non-performing loans leads to a decrease in bank stability.

Regression Analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out, and the results are presented in Table 4. More specifically, it shows the regression results of liquidity ratio, non-performing loan ratio, capital adequacy ratio, efficiency, GDP and inflation on return on assets of Nepalese commercial banks.

Table 4

Regression model

Model	Intercept	Regression coefficients of						Adj. R_ bar2	SEE	F-value
		LR	NPL	CAR	EFF	GDP	INF			
1	1.498 (3.445)**	0.001 (0.161)						0.005	0.806	0.026

Model	Intercept	Regression coefficients of						Adj. R_ bar2	SEE	F-value
		LR	NPL	CAR	EFF	GDP	INF			
2	1.799 (26.332)**		-0.116 (5.217)**					0.110	0.759	27.218
3	1.435 (7.546)**			0.010 (0.729)				0.003	0.805	0.532
4	1.848 (9.677)**				-0.007 (1.535)			0.002	0.801	2.356
5	-5.751 (2.265)*					0.593 (2.883)**		0.083	0.791	8.313
6	1.931 (10.803)**						-0.051 (2.136)*	0.017	0.797	4.563
7	2.275 (5.238)**	0.006 (1.11)	-0.122 (5.334)**					0.111	0.758	14.24
8	2.297 (5.256)**	0.005 (0.839)	-0.125 (5.296)**	0.008 (0.533)				0.108	0.759	9.556
9	2.188 (4.715)**	0.005 (0.853)	-0.132 (5.104)**	0.008 (0.554)	-0.003 (0.704)			0.106	0.761	7.274
10	1.688 (9.182)**		-0.122 (4.994)**		-0.003 (0.649)			0.108	0.459	13.783
11	1.731 (6.252)**			0.008 (0.585)	-0.006 (1.468)			0.003	0.803	1.346
12	-6.875 (1.509)					0.678 (1.935)	-0.012 (0.298)	0.029	0.792	4.183
13	-7.404 (1.655)*	0.015 (2.38)*	-0.125 (4.878)**	0.003 (0.236)	-0.002 (0.523)	0.835 (2.362)*	-0.014 (0.367)	0.139	0.746	6.726

The result in Table 4 is based on panel data of 27 commercial banks with 216 observations for the study period from 2011/12 to 2018/19 by using a linear regression model. The model is $ROA_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 NPL_{it} + \beta_3 CAR_{it} + \beta_4 EFF_{it} + \beta_5 GDP_t + \beta_6 INF_t + e_{it}$, where the dependent variable is ROA (Return on assets is measured by the ratio of net income to total assets, in percentage). The independent variables are LR (Liquidity ratio is measured by the ratio of total loans to total deposits, in percentage), NPL (Non-performing loan ratio is measured by the ratio of non-performing loan to total loans, in percentage), CAR (Capital adequacy ratio is measured by the ratio of Tier I capital + Tier II capital to total risk weighted assets, in percentage), EFF (Efficiency is measured by the

ratio of cost to income ratio, in percentage), GDP (Gross domestic product is measured by nominal GDP, Rs in millions) and INF (Inflation is measured by change in consumer price index, in percentage).

Notes:

- i. *Figures in parentheses are t-values.*
- ii. *The asterisk signs (**) and (*) indicate that the results are significant at the one percent and five percent level, respectively.*
- iii. *Return on assets is the dependent variable.*

Table 4 shows that the beta coefficients for the efficiency ratio are negative with return on assets. It indicates that the efficiency ratio has a negative impact on return on assets. This finding is similar to the findings of Petria *et al.* (2015). Similarly, the beta coefficients for inflation are negative with return on assets. It indicates that inflation has a negative impact on return on assets. This finding is consistent with the findings of Chioma *et al.* (2015). Moreover, the beta coefficients for the capital adequacy ratio are positive with return on assets. It indicates that the capital adequacy ratio has a positive impact on return on assets. This finding is consistent with the findings of Akinleye and Fajuyagbe (2019). Likewise, the beta coefficients for non-performing loans are negative with return on assets. It indicates that non-performing loans has a negative impact on return on assets. This finding is similar to the findings of Koskei (2020).

The estimated regression results of liquidity ratio, non-performing loan ratio, capital adequacy ratio, efficiency, GDP, and inflation on return on equity of Nepalese commercial banks are presented in Table 5.

Table 5

Estimated Regression Results of Liquidity Ratio, Non-performing Loan Ratio, Capital Adequacy Ratio, Efficiency, GDP, and Inflation on Return on Equity

This result is based on panel data of 27 commercial banks with 216 observations for the study period from 2011/12 to 2018/19 by using linear regression model. The model is $ROE_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 NPL_{it} + \beta_3 CAR_{it} + \beta_4 EFF_{it} + \beta_5 GDP_t + \beta_6 INF_t + e_{it}$, where the dependent variable is ROE (Return

on equity is measured by the ratio of net income to total equity, in percentage). The independent variables are LR (Liquidity ratio is measured by the ratio of total loans to total deposits, in percentage), NPL (Non-performing loan ratio is measured by the ratio of non-performing loan to total loans, in percentage), CAR (Capital adequacy ratio is measured by the ratio of Tier I capital + Tier II capital to total risk weighted assets, in percentage), EFF (Efficiency is measured by the ratio of cost to income ratio, in percentage), GDP (Gross domestic product is measured by nominal GDP, Rs in millions) and INF (Inflation is measured by change in consumer price index, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_ bar2	SEE	F-value
		LR	NPL	CAR	EFF	GDP	INF			
1	28.877 (6.505)**	-0.172 (3.126)**						0.089	8.578	9.774
2	17.864 (24.239)**		-1.387 (5.802)**					0.134	8.186	33.667
3	18.071 (9.604)**			-0.229 (1.653)				0.008	8.716	2.733
4	18.160 (9.412)**				-0.070 (1.656)			0.008	8.716	2.743
5	13.469 (0.483)					0.134 (0.059)		0.005	8.771	0.003
6	13.287 (6.788)**						0.254 (0.982)	0.004	8.752	0.965
7	40.372 (9.118)**	-0.273 (5.147)**	-1.673 (7.196)**					0.227	7.732	32.115
8	41.391 (9.409)**	-0.224 (3.980)**	-1.811 (7.64)**	-0.358 (2.398)*				0.244	7.645	23.810
9	40.325 (8.632)**	-0.225 (3.989)**	-1.885 (7.226)**	-0.361 (2.414)*	-0.031 (0.685)			0.242	7.655	17.930
10	22.983 (7.742)**			-0.301 (2.125)*	-0.092 (2.128)*			0.024	8.645	3.652
11	17.126 (8.63)**		-1.432 (5.415)**		-0.019 (0.400)			0.130	8.202	16.847
12	-58.931 (1.185)					5.557 (1.453)	0.768 (1.754)	0.005	8.729	1.540
13	-69.402 (1.527)	-0.286 (4.375)**	-1.861 (7.160)**	-0.308 (2.056)*	-0.036 (0.796)	8.831 (2.458)*	0.662 (1.697)	0.257	7.581	13.204

Notes:

- i. *Figures in parenthesis are t-values.*
- ii. *The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels, respectively.*
- iii. *Return on equity is the dependent variable.*

Table 5 shows that the beta coefficients for the liquidity ratio are negative with return on equity. It indicates that the efficiency ratio has a negative impact on return on equity. This finding is similar to the findings of Molyneux and Thornton (1992). Similarly, the beta coefficients for non-performing loans are negative with return on equity. It indicates that non-performing loans have a negative impact on return on equity. This finding is consistent with the findings of Bawaneh and Dahiyat (2019). Moreover, the beta coefficients for the capital adequacy ratio are positive with return on equity. It indicates that the capital adequacy ratio has a positive impact on return on equity. This finding is consistent with the findings of Olatayo et al. (2019). Likewise, the beta coefficients for gross domestic product are positive with return on equity. It indicates that gross domestic product has a positive impact on return on equity. This finding is similar to the findings of Rupeika-Apoga et al. (2018).

The estimated regression results of liquidity ratio, non-performing loan ratio, capital adequacy ratio, efficiency, GDP and inflation on the stability of Nepalese commercial banks have been presented in Table 6.

Table 6

Estimated Regression Results of Liquidity Ratio, Non-Performing Loan Ratio, Capital Adequacy Ratio, Efficiency, GDP and Inflation on Bank Stability

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		LR	NPL	CAR	EFF	GDP	INF			
1	-6.961 (2.441)*	0.281 (7.972)**						0.225	5.509	63.550
2	16.929 (32.015)**		-0.573 (3.339)**					0.046	5.873	11.149
3	5.279 (4.652)**			0.800 (9.577)**				0.297	5.249	91.725

Model	Intercept	Regression coefficients of						Adj. R_ bar2	SEE	F- value
		LR	NPL	CAR	EFF	GDP	INF			
4	19.768 (14.581)**				-0.097 (3.253)**			0.043	6.125	10.584
5	-81.121 (4.306)**					7.843 (5.134)**		0.106	5.920	26.359
6	21.505 (16.083)**						-0.823 (4.659)**	0.088	5.978	21.705
7	-2.451 (0.794)	0.235 (6.356)**	-0.326 (2.012)*					0.196	5.391	26.815
8	-4.017 (1.385)	0.160 (4.306)**	-0.115 (0.735)	0.551 (5.590)**				0.297	5.040	30.869
9	7.461 (4.153)**			0.768 (8.961)**	-0.041 (1.567)			0.301	5.232	47.402
10	-36.449 (1.090)				-0.094 (3.310)**	4.781 (1.870)	-0.396 (1.355)	0.145	5.788	13.154
11	-3.270 (1.062)	0.160 (4.316)**	-0.063 (0.365)	0.553 (5.603)**	-0.022 (0.729)			0.296	5.046	23.232
12	-54.739 (1.622)					5.866 (2.261)*	-0.280 (0.942)	0.105	5.922	13.617
13	-26.839 (0.891)	0.116 (2.691)**	-0.026 (0.151)	0.565 (5.690)**	-0.028 (0.935)	2.267 (0.952)	-0.114 (0.442)	0.302	5.022	16.301

This result is based on panel data of 27 commercial banks with 216 observations for the study period from 2011/12 to 2018/19 by using a linear regression model. The model is $Z_STABit = \beta_0 + \beta_1 LRit + \beta_2 NPLit + \beta_3 CARit + \beta_4 EFFit + \beta_5 GDPt + \beta_6 INFt + eit$, where the dependent variable is Z_STAB (Bank stability is measured by Z-score, in percentage). The independent variables are LR (Liquidity ratio is measured by the ratio of total loans to total deposits, in percentage), NPL (Non-performing loan ratio is measured by the ratio of non-performing loan to total loans, in percentage), CAR (Capital adequacy ratio is measured by the ratio of Tier I capital + Tier II capital to total risk weighted assets, in percentage), EFF (Efficiency is measured by the ratio of cost to income ratio, in percentage), GDP (Gross domestic product is measured by nominal GDP, Rs in millions) and INF (Inflation is measured by change in consumer price index, in percentage).

Notes:

- i. *Figures in parentheses are t-values.*
- ii. *The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels, respectively.*
- iii. *Bank stability is the dependent variable.*

Table 6 shows that the beta coefficients for the efficiency ratio are negative with bank stability. It indicates that the efficiency ratio has a negative impact on bank stability. This finding is similar to the findings of Knezevic and Dobromirov (2016). Similarly, the beta coefficients for inflation are negative with bank stability. It indicates that inflation has a negative impact on bank stability. This finding is consistent with the findings of Barro (1995). Moreover, the beta coefficients for the capital adequacy ratio are positive with bank stability. It indicates that the capital adequacy ratio has a positive impact on bank stability. This finding is consistent with the findings of Akinleye and Fajuyagbe (2019). Likewise, the beta coefficients for non-performing loans are negative with bank stability. It indicates that non-performing loans have a negative impact on bank stability. This finding is similar to the findings of Teshome *et al.* (2018).

Conclusion

Banking sustainability is a state in which the financial markets and the financial institutional system are resistant to economic shocks and fitted to smoothly fulfill the basic function of banks, like the intermediation of financial funds, management of all kinds of banking risk, and arrangement of resources. The financial sector plays an important role in the development of the country's economy and financial inclusion. The roles of banks in the economic growth and development of an economy cannot be disputed as they play a key financial intermediation role. Thus, understanding the impact of financial distress on financial sustainability is of paramount importance.

This study attempts to examine the impact of financial distress on financial sustainability in Nepalese commercial banks. This study is based on secondary data of 27 commercial banks with 216 observations for the study period from

2011/12 to 2018/19. The study showed that liquidity ratio, capital adequacy ratio, and GDP have a positive impact on return on assets. However, the study showed that the non-performing loan ratio, efficiency and inflation have a negative impact on return on assets. Similarly, the study showed that liquidity ratio, non-performing loan ratio, capital adequacy ratio and efficiency have a negative impact on return on equity. Likewise, inflation rate, non-performing loan ratio, and efficiency have a negative impact on bank stability. The study concluded that non-performing loans followed by gross domestic product are the most influential variables that explain the changes in return on assets of Nepalese commercial banks. In addition, the study also concluded that the capital adequacy ratio, followed by liquidity ratio and inflation rate, is the most influential variable that explains the changes in bank stability of Nepalese commercial banks.

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