The Effect of Financial Distress on Performance of Nepalese Commercial Banks

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Abstract: The research looks at how financial crisis affects the performance of Nepalese commercial banks. The dependent variables are return on assets and Z-score. Liquidity ratio, leverage ratio, capital adequacy ratio, spread rate, credit risk, credit to deposit ratio, and loan loss provision are the independent variables chosen. The study is based on secondary data from 27 commercial banks, totaling 216 observations from 2012/13 to 2019/20. The information was gathered from the Nepal Rastra Bank’s Banking and Financial Statistics, the Ministry of Finance’s (MoF) publications and webpages, and the annual reports of the selected commercial banks. To examine the relevance and importance of financial hardship on the performance of Nepalese commercial banks, correlation coefficients and regression models are estimated.

According to the findings, spread rate has a beneficial influence on return on assets and Z-score. It implies that an increase in the spread rate leads to an increase in the return on assets and the Z-score. Furthermore, the study found that loan loss provision had a negative influence on return on assets and the Z-score. It follows that the bigger the loan loss provision, the lower the return on assets and Z-score. Credit risk, on the other hand, has a negative influence on return on assets and Z-score. This indicates that the bigger the credit risk, the lower the return on assets and Z-score. Similarly, the leverage ratio has a negative influence on the return on assets and the Z-score. It follows that the larger the leverage ratio, the worse the return on assets and Z-score. Furthermore, the liquidity ratio influences the return on assets and the Z-score. It denotes that the higher the liquidity ratio, the better the return on assets and Z-score. Similarly, capital adequacy ratio influences return on assets and Z-score. It denotes that the greater the capital adequacy ratio, the higher the return on assets and Z-score. Similarly, the credit to deposit ratio influences return on assets and Z-score. It denotes that the larger the credit to deposit ratio, the higher the return on assets and Z-score.

Keywords: Return on assets, Z-score, liquidity ratio, leverage ratio, capital adequacy ratio, spread rate, credit risk, credit to deposit ratio and loan loss provision.
1. Introduction

Bank distress is a manifestation of systemic risk, acting as a stumbling block for the economy or financial system as a whole (Bernanke et al., 2014). A healthy and successful banking industry is better equipped to resist negative shocks and contribute to the financial system’s stability (Althanasoglou et al., 2008). Profitability refers to the capacity to profit from a company’s entire operations. It illustrates how effectively a corporation may make a return on its assets for a given investment. When an institution experiences financial, management, or operational problems, it is considered to be in financial distress. A banking sector’s purpose is to use resources wisely, which stimulates economic growth and increases worldwide competitiveness (Mwega, 2011).

Efficient financial services in the banking industry could only be delivered via banks’ effective handling of financial hardship (Bariviera et al., 2014).

Financial hardship is a major issue in practically all markets throughout the world. According to Adeyemi (2012), financial distress is a circumstance in which an institution is experiencing operational, managerial, and financial issues. According to John (2014), the financial industry confronts a number of issues when it is in financial trouble. Low financial distress indicates that banks’ financial performance is improving (Meher and Getaneh, 2019). A firm’s effectiveness and profitability require a balanced liquidity level. According to Hakim and Sugianto (2018), the loan-to-deposit ratio has no substantial impact on the bank’s health.

According to Ibrahim (2017), every rise in loan deposit ratio leads to an increase in return on asset. According to Nohong (2017), the loan deposit ratio shows a negative link with the bank’s return on assets. Yudha et al. (2017) determined that the loan-to-deposit ratio has a detrimental influence on the return on assets in domestic banks. Musah et al. (2018) investigated the influence of interest rate spreads on Ghanaian bank profitability. According to the findings, there is a positive and statistically significant relationship between interest rate spread and bank profitability in Ghana. According to Baxter (1967), financially troubled enterprises may have difficulties acquiring trade credit, showing that a high degree of leverage raises the likelihood of bankruptcy and hence the riskiness of the firm.

Similarly, Alhadab and Alsahawneh (2016) investigated the influence of loan loss provision on Jordanian commercial bank profitability. The study discovered that loan loss provision had a negative influence on bank profitability. Furthermore, according to Iloska (2014), loan loss provision has a negative association with ROA. Furthermore, Andrade and Kaplan (1998) looked at the relationship between financial difficulty and financial performance. According to the analysis, loan loss provision has a negative influence on profitability. Similarly, Gizaw et al. (2015) shown that asset quality metrics such as non-performing loans, loan loss provisions, and capital adequacy had a substantial influence on commercial bank profitability in Ethiopia. According to Bhatia et al. (2012), the credit-to-deposit ratio has a beneficial influence on bank profitability in Indian economy.

In many economies, interest rates are a crucial factor of bank profitability (Aboagye et al. 2008; Kalsoom and Othman, 2021). According to Amidu et al. (2006), banks provide an efficient...
mechanism and the primary source of liquidity in the financial systems. According to Kimathi and Mungai (2018), leverage has a positive and statistically significant influence on profitability. Tan (2012) discovered that high leverage enterprises performed poorly during a crisis. Similarly, capital adequacy ratio and cash reserve are not seen as determinants of bank success. Nwude and Okeke (2018) discovered that credit risk management has a favourable and substantial influence on deposit money banks’ total loans and advances, return on asset, and return on equity. The study also discovered a link between credit risk management and commercial bank profitability in the United States. According to Khaddafí et al. (2017), there is a positive association between Z-score, bank efficiency, and profitability. Tan and Floros (2012) found a favourable association between profitability and the Z-score of Chinese bank performance. Furthermore, Tabak et al. (2012) indicated that there is a positive association between Z-score and bank profitability. According to Shiri et al. (2015), there is an inverse link between the loan-to-deposit ratio and bank profitability. Christaria and Kurnia (2016) found that the loan-to-deposit ratio has a strong negative influence on bank profitability proxies such as return on assets (ROA).

According to Eltabakh et al. (2014), there is a statistically significant positive association between profitability and loan-to-deposit ratio. Sari and Septiano (2020) found that the loan-to-deposit ratio had a negligible negative influence on ROA. According to Awulo et al. (2019), the loan-to-deposit ratio has a negative impact on return on assets. A well-capitalized corporation confronts reduced predicted bankruptcy expenses, which reduces funding costs and increases profitability (Berger, 1995). Udom and Eze (2018) demonstrated that capital sufficiency has a beneficial influence on the financial performance of Nigerian commercial banks.

According to Pasaribu and Sari (2011), the capital adequacy ratio (CAR) and the loan to deposit ratio (LDR) have a considerable impact on profitability (ROA). Furthermore, Alshatti (2015) examined the impact of liquidity management on profitability in Jordanian commercial banks. The capital adequacy ratio has no influence on bank profitability, according to the study. Similarly, Roman and Danuletiu (2013) investigated the factors influencing bank profitability in Romania. According to the study, capital sufficiency has a positive and direct association with profitability. Mishra and Pradhan (2019) discovered that loan deposit ratio has a considerable negative influence on return on assets. Rifqah and Hassan (2019) also explored the link between credit risk, liquidity, and capital adequacy and bank profitability in Indonesia. According to the findings, there is a considerable inverse link between net interest margin and return on asset.

Furthermore, Ali and Puah (2018) investigated the internal factors of bank profitability and the stability of Pakistan’s banking industry. According to the study, bank size, credit risk, financing risk, and stability all have statistically significant influence on profitability, but liquidity risk has a statistically minor impact. Similarly, Rizwan and Mutahhar (2016) examined the influence of liquidity on the profitability of Pakistani commercial banks. According to the findings of the study, there is a considerable positive association between bank profitability and liquidity. According to the study, the current ratio, quick ratio, gross profit margin, and nett profit margin all have a positive and significant influence on profitability. Bourke (1989) investigated bank concentration and other factors influencing profitability in Europe, North America, and Australia.
According to the findings, capital ratios, liquidity ratios, and interest rates are all positively associated to profitability.

In the context of Nepal, Sedhain (2012) stated that credit risk management has a favourable and considerable influence on the profitability of commercial banks in Nepal. Similarly, Maharjan (2007) discovered that capital adequacy and liquidity are positively related to bank profitability. According to Thapaliya (2016), capital adequacy ratio is positively associated to return on assets and earnings per share. Sharma (2016) shown that when bank size, total deposit to total assets ratio, and net interest margin grow, the liquid assets to total assets ratio decreases. Thapa et al. (2017) investigated the determinants influencing liquidity in a sample of Nepalese commercial banks.

Furthermore, Ali and Puah (2018) investigated the internal factors of bank profitability and the stability of Pakistan’s banking industry. According to the study, bank size, credit risk, financing risk, and stability all have statistically significant influence on profitability, but liquidity risk has a statistically minor impact. Similarly, Rizwan and Mutahhar (2016) examined the influence of liquidity on the profitability of Pakistani commercial banks. According to the findings of the study, there is a considerable positive association between bank profitability and liquidity. According to the study, the current ratio, quick ratio, gross profit margin, and net profit margin all have a positive and significant influence on profitability. Bourke (1989) investigated bank concentration and other factors influencing profitability in Europe, North America, and Australia. According to the findings, capital ratios, liquidity ratios, and interest rates are all positively associated to profitability.

In the context of Nepalese commercial banks, Sedhain (2012) stated that credit risk management has a favourable and considerable influence on the profitability of commercial banks in Nepal. Similarly, Maharjan (2007) discovered that capital adequacy and liquidity are positively related to bank profitability. According to Thapaliya (2016), capital adequacy ratio is positively associated to return on assets and earnings per share. Sharma (2016) shown that when bank size, total deposit to total assets ratio, and net interest margin grow, the liquid assets to total assets ratio decreases. Thapa et al. (2017) investigated the determinants influencing liquidity in a sample of Nepalese commercial banks. Therefore, in order to support one view or the other, this study has been conducted.

The main purpose of the study is to analyze the effect of financial distress on the performance of Nepalese commercial banks. Specifically, it examines the relationship of liquidity ratio, leverage ratio, capital adequacy ratio, spread rate, credit risk, credit to deposit ratio and loan loss provision with return on assets and Z-score of Nepalese commercial banks. The rest of this study is structured as follows.

The second section discusses the sample, statistics, and methods. Section three discusses the empirical findings, and Section four derives the conclusion.

2. Methodological aspects

The study is based on secondary data collected from 27 Nepalese commercial banks between 2012/13 and 2019/20, yielding a total of 216 observations. The primary data sources are Nepal Rastra Bank (NRB) publications and websites, the Ministry of Finance (MoF), and the annual
reports of the chosen commercial banks. This study employs both descriptive and causal comparative research designs. Table 1 indicates the commercial banks chosen for the study, as well as the study duration and number of observations.

**Table 1: All commercial banks chosen for investigation, with study size and the number of data**

<table>
<thead>
<tr>
<th>S. N.</th>
<th>Name of the banks</th>
<th>Study period</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sunrise Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>2</td>
<td>Standard Chartered Bank Nepal Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>3</td>
<td>Siddhartha Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>4</td>
<td>Sanima Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>5</td>
<td>Rastriya Banijya Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>6</td>
<td>Prime Commercial Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>7</td>
<td>Prabhu Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>8</td>
<td>NMB Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>9</td>
<td>NIC Asia Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>10</td>
<td>Nepal SBI Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>11</td>
<td>Nepal Investment Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>12</td>
<td>Nepal Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>13</td>
<td>Nepal Bangladesh Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>14</td>
<td>NCC Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>15</td>
<td>Nabil Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>16</td>
<td>Mega Bank Nepal Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>17</td>
<td>Machhapuchhre Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>18</td>
<td>Laxmi Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>19</td>
<td>Kumari Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>20</td>
<td>Himalayan Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>21</td>
<td>Global IME Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>22</td>
<td>Everest Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>23</td>
<td>Civil Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>24</td>
<td>Citizens Bank International Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>25</td>
<td>Century Commercial Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>26</td>
<td>Bank of Kathmandu Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td>27</td>
<td>Agricultural Development Bank Limited</td>
<td></td>
<td>8 Obs.</td>
</tr>
<tr>
<td><strong>Total number of observations</strong></td>
<td></td>
<td><strong>216</strong></td>
<td></td>
</tr>
</tbody>
</table>

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As a result, the research is based on 216 observations.

The design

This study’s model posits that profitability is affected by financial crisis. The study’s dependent variables are return on assets and Z-Score. The independent variables chosen in this study include the liquidity ratio, leverage ratio, capital adequacy ratio, spread rate, credit risk, credit to deposit ratio, and loan loss provision. The model equations below are intended to test the hypothesis.

\[
ROA_{it} = \beta_0 + \beta_1 LIQ_{it} + \beta_2 LEV_{it} + \beta_3 CAR_{it} + \beta_4 CR_{it} + \beta_5 SR_{it} + \beta_6 CDR_{it} + \beta_7 LLP_{it} + e_{it}
\]

\[
ZS_{it} = \beta_0 + \beta_1 LIQ_{it} + \beta_2 LEV_{it} + \beta_3 CAR_{it} + \beta_4 CR_{it} + \beta_5 SR_{it} + \beta_6 CDR_{it} + \beta_7 LLP_{it} + e_{it}
\]

Where,

- **CAR** = Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage.
- **CDR** = Credit to deposit ratio as measured by the ratio of total credit to total deposit ratio, in percentage.
- **CR** = Credit risk as measured by the ratio of non-performing loan to total loan, in percentage.
- **LEV** = Leverage as measured by the ratio of total debt to total assets, in percentage.
- **LIQ** = Bank liquidity as measured by the ratio of total loan to total deposit, in percentage.
- **LLP** = Loan loss provision ratio as measured by ratio of loan loss provision to total operating income, in percentage.
- **ROA** = Return on assets as measured by the ratio of net income to total assets, in percentage.
- **SR** = Spread rate as measured by the difference between deposit rate and lending rate of bank, in percentage.
- **ZS** = Z-Score as measured by the ratio of capital to assets ratio to the standard deviation of return on assets.

The section that follows discusses the independent variables employed in this investigation, as well as the hypothesis formulation.

The liquidity ratio

The ratio of total loan to deposit measures a bank’s liquidity. It assesses the bank’s liquidity position. Bourke (1989) discovered a positive association between liquidity ratio and profitability, showing that the larger the liquidity ratio, the better the firm’s profitability. Furthermore, Mahdi and Abbes (2018) explored the drivers of capital, risk, and liquidity in conventional and Islamic banks. According to the findings, financing availability has a beneficial influence on bank risk and profitability. Similarly, Saleem and Rehman (2011) discovered that the liquid ratio had a considerable beneficial influence on assets ratio.
Similarly, Ibe (2013) demonstrated that maintaining an appropriate amount of liquidity aids in profit maximisation. Furthermore, Fielding and Shortland (2005) claimed that the amount of liquidity has a favourable and considerable impact on the bank’s profitability.

Based on that, the following hypothesis is developed in this study:

\[ H1: \text{There is a positive association between a bank's liquidity and its financial performance.} \]

**The leverage ratio**

Leverage is defined as the use of different financial instruments or borrowed funds to boost an investment’s potential return (Zeitun and Saleh, 2015). According to Foong (2012), leverage is inversely related with company performance. According to Poyry and Maury (2010), profitability was inversely related with leverage. Furthermore, Rahman et al. (2020) discovered a substantial negative link between leverage and corporate profitability.

Bunyaminu et al. (2021) discovered that leverage has a large negative impact on bank earnings. Similarly, Abbadi and Abu-Rub (2012) discovered that leverage had a negative and considerable impact on bank profitability. Furthermore, Yakubu et al. (2017) indicated that profitability and leverage have a negative association. Similarly, Akinlo and Asaolu (2012) discovered that leverage reduces bank profitability. Based on that, the following hypothesis is developed in this study:

\[ H2: \text{There is a negative link between leverage and bank performance.} \]

**Capital adequacy ratio**

According to Roman and Danuletiu (2013), capital adequacy has a positive and direct association with bank profitability in Romania. According to Isanzu (2017), capital sufficiency has a favourable and considerable influence on the ROA of Chinese banks. According to Onaolapo and Olufemi (2012), there is a positive and substantial association between the Nigerian banking sector’s capital adequacy ratio and return on assets. The capital adequacy ratio, according to Nelson (2020), has a favourable influence on return on assets. Furthermore, Mathuva (2009) showed that capital sufficiency and bank profitability are connected. Molynex and Thornton (1992) discovered that capital ratio had a beneficial influence on bank performance.

This study bases its findings on the following hypothesis:

\[ H3: \text{The capital adequacy ratio and bank financial performance have a favourable association.} \]

**Provision for loan losses**

According to Alhadab and Alsahawneh (2016), loan loss provision has a detrimental influence on profitability. Similarly, Iloska (2014) asserted that in Macedonia, loan loss provision had a negative association with ROA. Similarly, Ahmad et al. (2014) discovered a negative link between loan loss provision (LLP) and profitability (ROA and ROE). Similarly, Ul Mustafa et al. (2012) discovered a negative link between loan loss provision (LLP) and profitability. Based on that, the following hypothesis is developed in this study:

\[ H4: \text{There is an inverse link between loan loss provision and bank financial performance.} \]
Credit risk

According to Noman et al. (2015), credit risk has a negative association with bank profitability. Kolapo et al. (2012) discovered a negative link between credit risk and bank profitability in Nigerian commercial banks as well. Furthermore, Kargi (2011) discovered that credit risk management has a considerable influence on Nigerian bank profitability. Furthermore, the study indicated that the number of loans and advances, as well as non-performing loans, has an inverse relationship with profitability. Furthermore, Kishori and Sheeba (2017) demonstrated that credit risk has a large negative influence on the profitability of commercial banks in India. Furthermore, Kaaya and Pastory (2013) discovered that credit risk had a detrimental influence on the profitability of Tanzanian commercial banks. Based on that, the following hypothesis is developed in this study:

H5: Credit risk has a negative link with bank profitability.

Rate of spread

According to Owusu-Antwi et al. (2017), bank spread has a favourable influence on the profitability of commercial banks in Ghana. Similarly, Musah et al. (2018) discovered a positive and statistically significant relationship between interest rate spread and bank profitability. Khan and Sattar (2014) discovered a substantial positive link between interest spread and profitability. Furthermore, Ngugi (2001) stated that spread is central to bank performance, and that banks that can maintain a bigger gap outperform other banks when all other variables are held constant.

Spread rate

Owusu-Antwi et al. (2017) revealed that bank spread has positive effect on the profitability of commercial banks in Ghana. Likewise, Musah et al. (2018) found that there is a positive and statistically significant association between interest rate spread and bank profitability. Similarly, Khan and Sattar (2014) revealed that there is a significant positive relationship between interest spread and profitability. In addition, Ngugi (2001) argued that spread is core to bank performance and those banks which manage to keep wider spread perform better than other banks holding other factors constant. Furthermore, Gerlach (2003) discovered that changes in profitability are strongly tied to the net interest margin and the nonperforming loan (NPL) ratio, both of which influence banks’ provisioning choices. Similarly, Karki (2020) discovered that interest rate spreads had a favourable influence on bank profitability. Based on that, the following hypothesis is developed in this study:

H6: The spread rate and bank profitability have a favourable association.

The credit-to-deposit ratio

Sharifi and Akhter (2016) discovered a favourable association between credit to deposit ratio and profitability in India’s public sector banks. Furthermore, Kosmidou et al. (2008) discovered a significant correlation between the loan to deposit ratio and the profitability ratio.

Similarly, Muhmad and Hashim (2015) discovered a beneficial influence of loan to deposit ratio on performance as assessed by ROA and ROE in Malaysia. According to Prasanjaya and Ramantha
(2013), the loan deposit ratio has a considerable beneficial influence on the bank’s return on assets. Similarly, Altunbas and Marques (2008) discovered that the loan to customer deposit ratio had a substantial positive link with business profitability. Based on that, the following hypothesis is developed in this study:

**H7: The credit-to-deposit ratio and bank profitability have a favourable link.**

### 3. Results and Discussion

#### Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2012/13 to 2019/20.

**Table 2: Descriptive statistics**

This table displays the descriptive statistics of 27 Nepalese commercial banks’ dependent and independent variables from 2012/13 to 2019/20. The dependent variables are ROA (return on assets as defined by the percentage ratio of net income to total assets) and ZS (Z-Score as measured by the ratio of capital to assets ratio to the standard deviation of return on assets).

**LIQ** (bank liquidity as measured by the ratio of total loan to total deposit, in percentage), **LEV** (leverage as assessed by the ratio of total debt to total assets, in percentage), and **CAR** are the independent variables (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), **CR** (Credit risk as measured by the ratio of non-performing loan to total loan, in percentage), **SR** (Spread rate as measured by the difference between the bank’s deposit rate and lending rate, in percentage), **CDR** (Credit to deposit ratio as measured by the ratio of total credit to total deposit ratio, in percentage), and **LLP** (Loan Loss Provision) (Loan loss provision ratio as measured by ratio of loan loss provision to total operating income, in percentage).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>-3.43</td>
<td>3.57</td>
<td>1.61</td>
<td>0.71</td>
</tr>
<tr>
<td>ZS</td>
<td>1.03</td>
<td>72.75</td>
<td>16.17</td>
<td>5.97</td>
</tr>
<tr>
<td>LLP</td>
<td>0.04</td>
<td>13.24</td>
<td>1.06</td>
<td>1.27</td>
</tr>
<tr>
<td>LEV</td>
<td>0.34</td>
<td>5.99</td>
<td>1.35</td>
<td>0.91</td>
</tr>
<tr>
<td>LIQ</td>
<td>24.58</td>
<td>105.72</td>
<td>81.64</td>
<td>10.91</td>
</tr>
<tr>
<td>CAR</td>
<td>-0.59</td>
<td>22.99</td>
<td>12.95</td>
<td>2.82</td>
</tr>
<tr>
<td>CDR</td>
<td>48.32</td>
<td>110.94</td>
<td>81.23</td>
<td>10.23</td>
</tr>
<tr>
<td>SR</td>
<td>1.98</td>
<td>7.17</td>
<td>4.11</td>
<td>0.77</td>
</tr>
<tr>
<td>CR</td>
<td>0.00</td>
<td>24.29</td>
<td>1.85</td>
<td>2.16</td>
</tr>
</tbody>
</table>

**Source:** SPSS output

**Correlation analysis**

Following the presentation of the descriptive statistics, Pearson’s correlation coefficients are computed and the results are shown in Table 3.
Table 3: Pearson’s correlation coefficients matrix

The bivariate Pearson’s correlation coefficients of dependent and independent variables for 27 Nepalese commercial banks from 2012/13 to 2019/20 are shown in this table. The dependent variables are ROA (return on assets as defined by the percentage ratio of net income to total assets) and ZS (Z-Score as measured by the ratio of capital to assets ratio to the standard deviation of return on assets). LIQ (bank liquidity as measured by the ratio of total loan to total deposit, in percentage), LEV (leverage as assessed by the ratio of total debt to total assets, in percentage), and CAR are the independent variables (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CR (Credit risk as measured by the ratio of non-performing loan to total loan, in percentage), SR (Spread rate as measured by the difference between the bank’s deposit rate and lending rate, in percentage), CDR (Credit to deposit ratio as measured by the ratio of total credit to total deposit ratio, in percentage), and LLP (Loan Loss Provision) (Loan loss provision ratio as measured by ratio of loan loss provision to total operating income, in percentage).

<table>
<thead>
<tr>
<th>Variables</th>
<th>ROA</th>
<th>ZS</th>
<th>LLP</th>
<th>LEV</th>
<th>LIQ</th>
<th>CAR</th>
<th>CDR</th>
<th>SR</th>
<th>CR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZS</td>
<td>0.359**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LLP</td>
<td>-0.514**</td>
<td>-0.149*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEV</td>
<td>-0.391**</td>
<td>-0.158*</td>
<td>0.129</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIQ</td>
<td>0.032</td>
<td>0.383**</td>
<td>-0.152*</td>
<td>-0.026</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAR</td>
<td>0.204**</td>
<td>0.511**</td>
<td>-0.061</td>
<td>0.044</td>
<td>0.341**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CDR</td>
<td>0.019</td>
<td>0.390**</td>
<td>-0.199**</td>
<td>0.016</td>
<td>0.874**</td>
<td>0.344**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR</td>
<td>0.351**</td>
<td>0.130</td>
<td>0.035</td>
<td>-0.519**</td>
<td>-0.124</td>
<td>0.020</td>
<td>-0.120</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CR</td>
<td>-0.372**</td>
<td>-0.209**</td>
<td>0.695**</td>
<td>0.068</td>
<td>-0.203**</td>
<td>-0.220**</td>
<td>-0.199**</td>
<td>0.141*</td>
<td>1</td>
</tr>
</tbody>
</table>

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

Figure 3 depicts a negative link between loan loss provision and return on assets. It suggests that an increase in loan loss provision results in a fall in return on assets. Similarly, the leverage ratio is inversely connected to the return on assets. It demonstrates that increasing the leverage ratio reduces the return on assets. Similarly, the liquidity ratio is connected to the return on assets. It implies that an increase in the liquidity ratio leads to an increase in the return on assets. According to the research, capital adequacy ratio is favourably associated to return on assets. It demonstrates that the higher the capital adequacy ratio, the better the return on assets.

The study also found that the credit-to-deposit ratio is connected to the return on assets. It demonstrates that the higher the credit to deposit ratio, the higher the return on assets. Similarly, the spread rate is positively connected to the return on assets. It implies that an increase in the spread rate leads to an increase in the return on assets. The study does, however, reveal that credit
risk is negatively associated to return on assets. It denotes that the bigger the credit risk, the lower the return on assets.

Similarly, the findings indicate a negative link between loan loss provision and Z-score. It implies that an increase in loan loss provision results in a fall in Z-score. Similarly, the leverage ratio is inversely connected to the Z-score. It illustrates that increasing the leverage ratio causes a reduction in the Z-score. The liquidity ratio is connected to the Z-score. It implies that an increase in the liquidity ratio leads to an increase in the Z-score. It demonstrates that the capital adequacy ratio is favourably associated to the Z-score. It demonstrates that the greater the capital adequacy ratio, the higher the Z-score. The study also found that the credit-to-deposit ratio is connected to the Z-score. It demonstrates that the higher the credit to deposit ratio, the higher the Z-score. Similarly, the spread rate is positively connected to the Z-score. It shows that increasing the spread rate causes an increase in the Z-score. According to the study, credit risk is adversely associated to Z-score. It implies that the larger the credit risk, the lesser would be Z-score.

**Regression analysis**

After indicating the Pearson’s correlation coefficients, the regression analysis was performed, and the results are shown in Table 4. It explicitly demonstrates the regression findings of Nepalese commercial banks’ liquidity ratio, leverage ratio, capital adequacy ratio, spread rate, credit risk, credit to deposit ratio, and loan loss provision on return on assets.

**Table 4: Estimated regression results of liquidity ratio, leverage ratio, capital adequacy ratio, spread rate, credit risk, credit to deposit ratio and loan loss provision on return on assets**

This result is based on panel data of 27 commercial banks with 216 observations for the study period from 2012/13 to 2019/20 by using linear regression model. The model is

\[
\text{ROA}_{it} = \beta_0 + \beta_1 \text{LIQ}_{it} + \beta_2 \text{LEV}_{it} + \beta_3 \text{CAR}_{it} + \beta_4 \text{CR}_{it} + \beta_5 \text{SR}_{it} + \beta_6 \text{CDR}_{it} + \beta_7 \text{LLP}_{it} + e_{it}
\]

where, the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are LIQ (Bank liquidity as measured by the ratio of total loan to total deposit, in percentage), LEV (Leverage as measured by the ratio of total debt to total assets, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CR (Credit risk as measured by the ratio of non-performing loan to total loan, in percentage), SR (Spread rate as measured by the difference between deposit rate and lending rate of bank, in percentage), CDR (Credit to deposit ratio as measured by the ratio of total credit to total deposit ratio, in percentage) and LLP (Loan loss provision ratio as measured by ratio of loan loss provision to total operating income, in percentage).
<table>
<thead>
<tr>
<th>Model</th>
<th>Intercept</th>
<th>Regression coefficients of</th>
<th>Adj. R_bar²</th>
<th>SEE</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.906 (34.978)**</td>
<td>LLP = -0.287 (8.715)** LEV = -0.304 (6.182)** LIQ = 0.002 (0.463) CAR = 0.612 CDR = 0.260 SR = 0.149 CR = 0.713</td>
<td>75.953</td>
<td>0.612</td>
<td>38.217</td>
</tr>
<tr>
<td>2</td>
<td>2.014 (25.054)**</td>
<td>LLP = 0.056 (3.042)** LEV = 0.001 (0.273) LIQ = 0.321 (5.460)**</td>
<td>9.253</td>
<td>0.698</td>
<td>2.153</td>
</tr>
<tr>
<td>3</td>
<td>1.430 (3.812)**</td>
<td>LLP = 1.906 LEV = 2.014 LIQ = 1.430 CAR = 0.873 CDR = 0.149 SR = 0.656 CR = 0.231</td>
<td>1.159</td>
<td>0.668</td>
<td>29.815</td>
</tr>
<tr>
<td>4</td>
<td>0.873 (3.574)**</td>
<td>LLP = 1.494 LEV = 0.873 LIQ = 0.284 CAR = 2.549 CDR = 0.149 SR = 0.656 CR = 0.231</td>
<td>0.134</td>
<td>0.662</td>
<td>34.058</td>
</tr>
<tr>
<td>5</td>
<td>1.494 (3.751)**</td>
<td>LLP = 0.284 LEV = 2.549 LIQ = 1.494 CAR = 0.873 CDR = 0.149 SR = 0.656 CR = 0.231</td>
<td>0.365</td>
<td>0.657</td>
<td>62.259</td>
</tr>
<tr>
<td>6</td>
<td>1.826 (30.771)**</td>
<td>LLP = 1.494 LEV = 0.284 LIQ = 1.826 CAR = 0.873 CDR = 0.149 SR = 0.656 CR = 0.231</td>
<td>0.365</td>
<td>0.657</td>
<td>41.886</td>
</tr>
<tr>
<td>7</td>
<td>0.284 (1.154)</td>
<td>LLP = 0.284 LEV = 0.284 LIQ = 0.284 CAR = 0.873 CDR = 0.149 SR = 0.656 CR = 0.231</td>
<td>0.134</td>
<td>0.662</td>
<td>34.058</td>
</tr>
<tr>
<td>8</td>
<td>1.131 (2.591)**</td>
<td>LLP = 0.284 LEV = 0.284 LIQ = 0.284 CAR = 0.873 CDR = 0.149 SR = 0.656 CR = 0.231</td>
<td>0.449</td>
<td>0.528</td>
<td>29.900</td>
</tr>
<tr>
<td>9</td>
<td>1.129 (2.582)**</td>
<td>LLP = 0.284 LEV = 0.284 LIQ = 0.284 CAR = 0.873 CDR = 0.149 SR = 0.656 CR = 0.231</td>
<td>0.447</td>
<td>0.529</td>
<td>25.554</td>
</tr>
</tbody>
</table>

Notes:
1. Figures in parenthesis are t-values.
2. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
3. Return on assets is the dependent variable.

Table 4 illustrates that the beta coefficients for the loan loss provision ratio are inversely proportional to the return on assets. It demonstrates that the loan loss provision ratio reduces return on assets. This discovery is comparable to Iloska’s findings (2014). Similarly, the beta coefficients for leverage are inversely proportional to the return on assets. It suggests that leverage has a detrimental influence on asset return. This discovery is consistent with Yakubu et al findings (2017). Furthermore, the beta coefficients for the liquidity ratio are positive in relation to the return on assets. It suggests that the liquidity ratio has a beneficial effect on the return on assets. This discovery is comparable to Saleem and Rehman’s findings (2011). Similarly, the beta coefficients for capital adequacy ratio and return on assets are positive. It suggests that the capital
adequacy ratio has a beneficial effect on return on assets. This conclusion is consistent with Onaolapo and Olufemi’s findings (2012). Similarly, the beta coefficients for loan to deposit ratio are positive when adjusted for return on assets. It suggests that the credit-to-deposit ratio has a beneficial effect on the return on assets. This observation is consistent with Muhmad and Hashim’s findings (2015). Similarly, the beta coefficients for spread rate are positive in relation to return on assets. It implies that the spread rate has a favourable influence on asset return. This discovery is comparable to Karki’s findings (2020).

Table 5 shows the regression findings of the liquidity ratio, leverage ratio, capital adequacy ratio, spread rate, credit risk, credit to deposit ratio, and loan loss provision on the Z-score of Nepalese commercial banks.

Table 5: Estimated regression results of liquidity ratio, leverage ratio, capital adequacy ratio, spread rate, credit risk, credit to deposit ratio and loan loss provision on Z-score

This result is based on panel data of 27 commercial banks with 216 observations for the study period from 2012/13 to 2019/20 by using linear regression model. The model is

$$Z_{S_t} = \beta_0 + \beta_1 LIQ_t + \beta_2 LEV_t + \beta_3 CAR_t + \beta_4 CR_t + \beta_5 SR_t + \beta_6 CDR_t + \beta_7 LLP_t + e_t$$

where the dependent variable is ZS (Z-Score as measured by the ratio of capital to assets ratio to the standard deviation of return on assets). The independent variables are LIQ (Bank liquidity as measured by the ratio of total loan to total deposit, in percentage), LEV (Leverage as measured by the ratio of total debt to total assets, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), CR (Credit risk as measured by the ratio of non-performing loan to total loan, in percentage), SR (Spread rate as measured by the difference between deposit rate and lending rate of bank, in percentage), CDR (Credit to deposit ratio as measured by the ratio of total credit to total deposit ratio, in percentage) and LLP (Loan loss provision ratio as measured by ratio of loan loss provision to total operating income, in percentage).

<table>
<thead>
<tr>
<th>Model</th>
<th>Intercept</th>
<th>Regression coefficients of</th>
<th>Adj, R-bar^2</th>
<th>SEE</th>
<th>F-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LLP</td>
<td>LEV</td>
<td>LIQ</td>
<td>CAR</td>
<td>CDR</td>
</tr>
<tr>
<td>1</td>
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<td>0.018</td>
<td>5.919</td>
<td>4.836</td>
</tr>
<tr>
<td></td>
<td>(32.200)**</td>
<td>(2.199)*</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>17.567</td>
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<td>0.020</td>
<td>5.911</td>
<td>5.466</td>
</tr>
<tr>
<td></td>
<td>(24.400)**</td>
<td>(2.338)*</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-0.925</td>
<td>0.209</td>
<td>0.142</td>
<td>5.353</td>
<td>36.678</td>
</tr>
<tr>
<td></td>
<td>(0.325)</td>
<td>(6.056)**</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2.122</td>
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<td>0.258</td>
<td>5.145</td>
<td>75.704</td>
</tr>
<tr>
<td></td>
<td>(1.284)</td>
<td>(8.701)**</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>-2.338</td>
<td>0.228</td>
<td>0.148</td>
<td>5.511</td>
<td>38.475</td>
</tr>
<tr>
<td></td>
<td>(0.777)</td>
<td>(6.203)**</td>
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</tr>
<tr>
<td>6</td>
<td>12.059</td>
<td>1.002</td>
<td>0.012</td>
<td>5.935</td>
<td>3.673</td>
</tr>
<tr>
<td></td>
<td>(5.524)**</td>
<td>(1.917)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Notes:
1. Figures in parenthesis are t-values.
2. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
3. Z-Score is the dependent variable.

The beta coefficients for loan loss provision ratio are negative with Z-Score, as shown in Table 5. It suggests that the loan loss provision ratio has a negative influence on the Z-Score. This discovery is comparable to Alhadab and Alsahawneh’s findings (2016). Similarly, with Z-Score, the beta coefficients for leverage are negative. It suggests that leverage has a detrimental effect on Z-Score. This discovery is consistent with Poyry and Maury’s findings (2010). Furthermore, the liquidity ratio beta coefficients are positive with Z-Score. It suggests that the liquidity ratio has a beneficial effect on the Z-Score. This discovery is comparable to Fielding and Shortland’s findings (2005). Furthermore, using Z-Score, the beta coefficients for capital adequacy ratio are positive. It implies that the capital adequacy ratio has a favourable effect on the Z-Score. This discovery is consistent with Tabak et al (2012). Similarly, with Z-Score, the beta coefficients for credit to deposit ratio are positive. It suggests that the credit-to-deposit ratio has a beneficial effect on the Z-Score. This discovery is compatible with Buchory’s findings (2015). Similarly, with Z-Score, the beta coefficients for spread rate are positive. It implies that the spread rate has a favourable effect on the Z-Score. This discovery is comparable to Floros’ observations (2014). Similarly, with Z-Score, the beta coefficients for credit risk are negative. It implies that credit risk has a negative effect on Z-Score. This discovery is consistent with Noman et al (2017).

4. Summary and Conclusion

A country’s financial soundness is dependent on a strong financial system, which includes a network of financial institutions, efficient financial markets, and marketable financial products. Financial institutions, such as banks and insurance firms, operate as intermediaries between savers and investors,
The purpose of this research is to examine the impact of financial hardship on the performance of Nepalese commercial banks. The study is based on secondary data from 27 commercial banks, totaling 216 observations from 2012/13 to 2019/20.

According to the findings, the liquidity ratio, capital adequacy ratio, credit to deposit ratio, and spread rate all have a favourable influence on return on assets and the Z-score. Loan loss provision, leverage ratio, and credit risk ratio, on the other hand, have a negative influence on return on assets and Z-score. According to the study, the most influential element that predicts variations in the return on assets is the loan loss provision ratio, followed by the leverage ratio and credit risk. Similarly, the study indicated that the most important element determining the Z-Score in the context of Nepalese commercial banks is capital adequacy ratio, followed by credit to deposit ratio and liquidity ratio.

**References**


