Ownership Structure, Deregulation and Bank Risk in Nepalese Commercial Banks

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Abstract

This study aims to examine the relationship between ownership structure, deregulation, and bank risk in Nepalese commercial banks. In the study, the non-performing loan has been considered as a response variable and ownership structure, bank size, bank age, and bank regulation have been taken as independent variables. The study is based on the secondary data of 20 commercial banks with 140 observations for the period from 2012 to 2018, employing descriptive and inferential statistical tools for the analysis. The correlation analysis reveals the significant and positive relationship of age with risk, which indicates that the bank's risk increases as the bank gets older. The study also signifies that the non-performing loans can be decreased with the implementation of capital regulation imposed by the regulatory body. The regression analysis depicts the negative and significant impact of bank size on bank risk when regressed together with the bank age. The mean value of non-performing loan for foreign-owned banks and private-owned banks is lower in comparison to that of government-owned banks. Similarly, the mean value of the non-performing loan for the deregulated period is higher in comparison to that of banks during the regulated period. The results provide interesting insights into the ownership structure and bank regulation in connection with bank risk. Hence this paper attempted to fill the gap in the existing literature in the context of Nepal. The study also elucidates that the banking business is not free from risk, and hence it has to consider a substantial number of factors while managing the risk.

Keywords: capital regulation, firm age, firm size, non-performing loan, ownership structure

Introduction

The ownership structure is a powerful incentive for managers to gain control over firms and sustain better performance (Omran et al., 2008). The type of bank ownership consists of foreign-owned banks, private domestically-owned banks, and state-owned

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banks (Berger et al. 2005). The ownership structure is the relative number of ownership claims held by insiders (management) and outsiders (investors with no direct role in the management of the firm). The highest proportion of ownership structure indicates the higher power of the owners to control the bank. (Holderness et al., 1999; Jensen & Meckling, 2019).

The risk-taking behavior of financial institutions affects financial and economic instability as well as economic growth (Bernanke, 1983). Holderness et al. (1999) found that the most important factors determining risk in the banking sector, were firm size and regulation. Saunders, Stroke, and Travlos (1990) found a significantly positive relationship between the level of insider ownership and risk-taking in a the sample of the banking industry during the 1972- 1982 period of deregulation. Cebenoyan et al. (1999) found that the thrifts with higher insider ownership pursue unprofitable risky activities during the periods of deregulation and low charter values, but pursue profitable risky activities during the periods of regulatory stringency and high charter values.

After the global financial crisis of 2007–08, the Basel III capital and liquidity standards were adopted by countries around the world and policy-makers were examining know whether they further should reduce the role of these banks (Rocha et al., 2011). These major changes introduced to the banking system created a move in the ownership structure and reinforced the need to examine their impact on banks' risk-taking behavior. As there are no well-developed markets for credit in developing economies, the nonfinancial sector has to rely more heavily on lending from the banks to fulfill their financial needs (Booth et.al. 2001). Sullivan and Spong (2007) showed that stock ownership by hired managers is positively linked to bank risk, meaning that hired managers operate their bank more closely in line with stockholders' interests under certain conditions. Curak et al. (2013) found a negative relationship between size and nonperforming loans. Ikram et al. (2016) found that bank branch age, term of the loan, and credit policy are the determining factors of non-performing loans. Pradhan and Pantha (2019) found that foreign ownership, liquidity ratio, bank size, and bank age are positively related to the return on equity and net interest margin of Nepalese commercial banks.

Saunders et al. (1990) empirically studied the impact of ownership structure on bank risk-taking and hypothesized that banks controlled by concentrated ownership structures exhibit higher risk-taking as compared to the banks with the diffused ownership structure. Boujelbene and Zribi (2009) evidenced the degree of ownership concentration and the identities of proprietors have a relatively strong effect on risk-taking behaviour. Besides the nature of the controlling shareholder, another important

dimension of banks' ownership structure is ownership concentration (Iannotta et al., 2007). Cornett et al. (2011) found a positive relationship between government participation in bank ownership and risk. These studies show that state-owned banks have poor loan quality and a higher default risk than privately owned banks. Gursoy and Aydogan (2002) examined and showed the impact of ownership structure on the risk-taking behaviour of Turkish firms. Liu et al. (2019) found that the ownership structure, whether government or private, both have a positive effect on bank credit risk. It is also evidenced that risk decreases with the concentration in government ownership, whereas risk increases with the increase in private ownership concentration.

Boyd et al. (2009) found that when firms are perceived to be too big to fail (TBTF), they have a propensity to assume excessive risks to profit in the short term. Indeed, the TBTF policy has been blamed by many as one of the main factors distorting financial firms' risk-taking incentives. Morrison and White (2005) argued that if banks do not have enough equity at stake, they may be tempted to make risky loans, meaning higher capital levels reduce moral hazard, and, therefore, lower risk-taking behavior in the banking sector. In the bank regulation process, the extent of moral hazard behavior should be identified to avoid future financial instability (Zhang et al., 2015). In the Nepalese context, Pradhan and Pandey (2016) concluded that return on assets, return on equity, and loans to total deposit ratio are the determinants of non-performing loans in Nepalese commercial banks. There are limited studies on ownership structure, deregulation, and bank risk in the Nepalese banking sector. This study examines the impact of ownership structure and regulation on bank risk-taking for government, foreign, and privately owned commercial banks in Nepal.

Methodology
The study has been carried out using the quantitative approach and deductive reasoning. The study is based on secondary data which were gathered from 20 commercial banks in Nepal from 2012 to 2018, leading to a total of 140 observations. The main source of data includes the banking and financial statistics of Nepal Rastra Bank (NRB) and annual reports of selected commercial banks. This study has employed a descriptive as well as an explanatory research design (Annex 1) based on the positivism philosophy.

The Model
The model estimated in this study assumes that a firm's risk-taking depends on a firm's age, size, ownership structure, and regulation. The empirical specification as suggested by Saunders et.al. (1990), Pradhan and Pantha (2019) has been used in this study to test the hypothesis. Therefore, the model takes the following form:

Bank risk = f (bank age, bank size, ownership structure, bank regulation).

$$NPL = \beta_0 + \beta_1\,SIZE + \beta_2\,AGE + \beta_3\,D_2 + \beta_4\,D_3 + \beta_5\,A_1 + e \dots\dots\dots\dots\dots\dots\dots..(1)$$

In the regression equation (1), the dependent variable is bank risk (as measured by NPL) and ownership structure (measured by dummy variables i.e D_2 and D_3), bank size (SIZE), bank age (AGE) and bank regulation (measured by dummy variable i.e REG) are independent variables.

The dummy variables in the model are used as $D_2 = 1$ if foreign ownership, zero otherwise; $D_3 = 1$ if private ownership, zero otherwise, and A1 = 1 if deregulated, zero otherwise.

Bank risk (NPL)
A non-performing loan is a ratio calculated by dividing the non-performing loans by the total loans. Lee (2009) used the non-performing loan ratio as a proxy for bank risk. The risk-taking behavior of financial institutions affects financial and economic fragility as well as economic growth (Bernanke, 1983, Calomiris & Mason, 2003; Keeley 1990). Hence, non-performing loan (NPL) has been taken as the proxy for bank risk in the study.

Bank size (SIZE)
The bank size is measured by the natural logarithm of the bank's total assets (Delis & Kouretas, 2011; Laeven & Levine, 2009). McAllister and McManus (1993) pointed out that larger banks have better risk diversification opportunities. Ranjan and Dhal (2003) explored an empirical approach to the analysis of commercial banks' non-performing loans (NPL) in the Indian context and evaluated how banks' non-performing loans are influenced by three major sets of economic and financial factors, i.e., terms of credit, bank size induced risk preferences and macroeconomic shocks. This study found that the bank size measured in terms of assets has a negative impact on non-performing loans.

H_1: There is a significant impact of bank size on bank risk.

Bank Age (AGE)
Bank age defined as the number of years of operation is an important factor concerning the extent of disclosure Athansasoglou et al. (2005).

As the firm grows older, its size increases and the size has a positive impact on performance, as the banks can diversify risk (Ghosh, 1998). Stinchcombe (2000) opined

that young organizations face higher risks of failure incurred during the additional learning costs involved in new roles and new tasks. Jonsson (2007) argued that younger firms are more difficult to monitor due to a lack of past records of performance, hence it leads to more risks. Based on it, this study develops the following hypothesis:

H_2: *Bank age has a significant impact on bank risk.*

Bank Ownership (OWN)

Government-owned banks are those financial institutions that are controlled by the government, as the majority of shares are held by the government. Hu et al.'s (2004) study shows that banks with higher government ownership recorded lower non-performing loans. Similarly, Barth et al. (2001) conclude that state-owned banks have a greater proportion of non-performing loans than others. The state-owned banks have poorer loan quality and higher default risk than privately owned banks (Berger et al., 2005; Iannotta et al., 2007). A foreign ownership bank is obligated to follow the regulations of both the home and host countries. Foreign-owned banks are those financial institutions that are invested by foreign investors. The presence of foreign banks is said to improve financial system infrastructure, including financial regulation (Glaessner & Oks, 1994). Dages et al. (2000) found that the domestically-owned, and the foreign-owned banks with low problem loan ratios perform correspondingly. A private ownership bank refers to those organizations whose shares are held by the general public and private institutions of the country. Karas et al. (2010) claimed that foreign banks are more efficient than domestic private banks and, domestic private banks are not as efficient as domestic public banks. Based on it, this study develops the following hypothesis:

H_3: *There is a significant impact of ownership structure on bank risk.*

Bank Regulation (REG)

Barth et al. (1999) evidenced that the banking regulations imposed by the monitoring authority of a country influence the risk-taking of banks. Laeven and Levine (2009) found that the effect of various regulations on bank's risk-taking tendency depends on the bank ownership structure. Koehn and Santomero (1980); Buser et al. (1981) argued that the impact of the capital regulations on bank's risk-taking tendency strongly depends upon the influence of the owners.

H_4: *Bank regulation has a significant impact on bank risk.*

Results and Discussion

Descriptive Statistics

The descriptive statistics of the dependent variable (non-performing loan) and independent variables (ownership structure, bank size, bank age, bank regulation) from the data obtained for the study period from 2012 to 2018 have been shown in Table 1.

Table 1: Summary of Descriptive Statistics
(The table shows the mean, standard deviation, minimum and maximum values of variables associated with 20 sample banks for the period of 7 years from 2012 to 2018, with 140 total observations for NPL (non-performing loan defined as total non-performing loan divided by total outstanding loan (in percentage), bank size (SIZE in millions of rupees), and bank age (in years from the establishment date).

Variables	N	Minimum	Maximum	Mean	Std. Dev.
NPL	140	.01	17.99	2.05	2.21
Size	140	11712.15	213835.20	74021.34	42072.02
Age	140	2	81	23.15	17.36

Table 1 shows that the bank's risk measured by non-performing loans (NPL) ranges from 0.01 percent to 17.99 percent, with an average of 2.05 percent, with a deviation of 2.21 percent from the average value. It indicates that the NPL of Nepalese commercial banks is less than the NRB guidelines, i.e., 5 percent for the study period. The mean value of the total assets shown by the firm size among the commercial banks during the study period is Rs 74021.34 million with a minimum value of Rs 11712.15 million and a maximum value of Rs 213835.20 million. Similarly, the average age of the sampled banks is 23.15 years with a minimum value of 2 years and a maximum value of 81 years.

Correlations Analysis

The Spearman rank correlation coefficient of different independent variables with bank risk (NPL) for 20 commercial banks during the study period has been presented in Table 2.

Table 2 : Spearman Correlation Coefficients of Independent Variables with Dependent
(The results are based on the secondary data of 20 commercial banks with 140 observations for the period of 2012 to 2018 employing the Spearman correlation coefficients of independent variables with the dependent variables. NPL (Non-performing loan) is the dependant variable, which is defined as the total non-performing

loan divided by the total outstanding loan (in percentage). The independent variables are ownership (defined as the banks with government investment), bank size (SIZE in millions of rupees), bank age (AGE in years from establishment date), and bank regulation (REG defined as capital regulation imposed by NRB).

Variables	NPL	SIZE	AGE	OWN	REG
NPL	1.000				
SIZE	.054	1.000			
AGE	.303**	.713**	1.000		
OWN	.584**	-.726**	-.507**	1.000	
REG	-.270**	-.150	-.533**	0.000	1.000

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

The correlation results reveal that there is a positive and significant relationship with age i.e., 0.303**. It indicates that as the firm grows older, higher would be the non-perming loan. Similarly, the relationship between government ownership and the non-performing loan is positive and significant i.e., 0.584**. However, there is a negative and significant relationship of bank risk with capital regulation (-0.270**) imposed by Nepal Rastra Bank (NRB) which means that NPL decreased after NRB increased paid up capital to 8 billion from 2015 onwards. This finding suggests that bank regulation is very important to the banking industry to remain safe from risks. Similarly, the firm size is positively related to NPL but not significant at 1% level of significance. It indicates that if the firm size increases, the NPL will also be increased feebly.

Regression Analysis
The regression analysis has been conducted to investigate whether or not the risk of the banks is affected by ownership structure, regulation, and other bank-specific variables.

Table 3
Estimated Regression Results of Ownership structure and Regulation on Bank risk
The results are based on the secondary data of 20 commercial banks with 140 observations for the period of 2012 to 2018 by using the ordinary least square (OLS) linear regression model: $NPL= \beta_0 + \beta_1 SIZE + \beta_2 AGE + \beta_3 D_2 + \beta_4 D_3 + \beta_5 A_1 + e$. *The dependent variable is NPL (non-performing loan defined as total non-performing loan divided by total outstanding loan, (in percentage). The independent variables are ownership structure (defined as the proportion of investment and using dummy variables i.e D_2 and D_3), bank size (SIZE in millions of rupees) defined as the natural*

logarithm of assets, bank age (AGE in years from establishment date), and the dummy of bank regulation (A_1).

| Models | Intercept | Regression Coefficient of | | | | | Adjusted R2 | SEE | F-value |
		LnSIZE	AGE	D_2	D_3	D_4			
1	-1.98 (-.874)	0.338 (1.649)					.013	1.441	2.719
2	.678 (4.133)**		0.048 (8.335)**				.340	1.178	69.468
3	2.151 (14.749)**			-1.116 (-4.583)**			.131	1.352	21.002
4	1.996 (11.298)**				-.483 (-1.949)		.021	1.435	3.797
5	1.489 (9.313)**					.638 (2.555)**	0.04	1.421	6.528
6	8.731 (4.148)**	-.761 (-3.837)**	.063 (9.323)**				.402	1.121	45.705
7	4.302 (21.323)**			-3.591 (-15.619)**	-3.120 (-14.144)**	.776 (5.306)**	.672	0.831	91.811
8	4.135 (1.889)**	.009 (0.047)	.001 (0.104)	-3.551 (-8.997)**	-3.067 (-6.757)**	.784 (4.069)**	0.667	0.837	54.252

Note: Figures in parentheses are t- values. The asterisk (*) sign indicates that the result is significant at the 5% level and the double asterisk (**) sign indicates that the result is significant at 1%.

Before running the OLS regression models, the assumptions for normality and multicollinearity were tested. After fulfilling the required conditions, the regression models were run. Table 3 exhibits the linear regression analysis with NPL as the response variable and others as predictor variables. There is no evidence of a significant impact of the natural logarithm of size on NPL when introduce as a single predictor (model 1). This finding contrasts with the findings of McAllister and McManus (1993); Ranjan and Dhal (2003). But, when introduced with age (model 6), the LnSize has a negative and significant impact on NPL with a coefficient of -0.761. In this regard, the findings are similar to those of McAllister and McManus (1993); Ranjan and Dhal

(2003). However, age has a positive and significant impact on NPL with a coefficient of 0.063. This finding is not consistent with the findings of (Ghosh, 1998; Stinchcombe, 2000; and Jonsson, 2007). Model 3 shows the linear regression analysis with NPL as the response variable and ownership, i.e., dummy variable (measured on a nominal scale) with three levels as the predictor variable. The government ownership was coded as zero and others as 1. The coefficient value of -1.116 indicates the mean value of NPL for foreign-owned banks is lower by 1.116 in comparison to the NPL of government-owned banks. Similarly, model 4 illustrates that the mean value of NPL for private ownership banks is lower by 0.483 in comparison to the NPL of government-owned banks. This finding is consistent with the studies of (Barth et al., 2001; Berger et al., 2005; Iannotta et al., 2007; Glaessner & Oks, 1994; Dages et al., 2000; Karas et al., 2010). However, the findings of the study contradicts with the findings of Hu et al. (2004). Introducing another dummy variable capital regulated by the central bank coded with zero and deregulated period by 1, model 5 shows that the mean value of the NPL for the deregulated period is higher by 0.683 in comparison to the NPL of banks during the regulated period. While relaxing the dummy variables, model 6 shows the explanatory power of the natural logarithm of size and age of the banks on the NPL with 40.20 percent with the negative beta of -0.761 and 0.063 for them at a 99 percent confidence interval respectively. Similarly, controlling the metric variables, model 7 shows the adjusted R square value of 0.672 indicating the explanatory power of dummy variables to the non-performing loan with 67.20 percent during the study period at a 99 percent confidence interval. As found by the studies (Barth et al., 1999; Laeven & Levine, 2009; Koehn & Santomero, 1980; Buser et al., 1981), the current study also evidences the influence of bank regulation on non-performing loans. The final model 8 has an F-value of 54.252 and fits the study, but the explanatory power of all the variables is 66.70 percent with insignificant values for natural logarithms for size and age.

Conclusion

Commercial banks are highly regulated in most countries and they have to face noticeable risks that exist in the environment, such as the risk of failure to pay by the borrower, uncertainty in the market, liquidity crunch, and returns on the investment. In this light, the study attempts to examine the relationship between ownership structure, deregulation, and bank risk in the Nepalese banking sector. The study considered three banks with government ownership, six with foreign ownership, and eleven with private ownership for the analysis. The bank's age has a positive and significant effect on non-performing loans. Hence, the study concludes that as the bank grows older, the greater would be the bank risk. Similarly, the result also indicates that government-owned banks have a higher NPL, compared to foreign-owned and privately-owned banks. The

bank size in isolation has positive but insignificant relation with NPL, which means that as the bank size increases, the NPL will also increase feebly. It indicates that government-owned banks are more prone to non-performing loan risks. Similarly, the mean value of the NPL for the deregulated period is higher in comparison to the NPL of banks during the regulated period. The study presents the evidence that the bank risk as measured by the non-performing loan is lower during the regulated period, and hence the instrument implemented by the central bank is very important in the banking sector. Ordinary least square regression models have only been used with limited variables in this study. Therefore, the future study employing panel data analysis models including other predictors can further contribute in this area.

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Annex 1

List of Sample Banks Selected for the Study

S.N	Name of the company	Study Period	Observations
Government Ownership			
1	Agricultural Development Bank Limited	2012 - 2018	7
2	Nepal Bank Limited	2012 - 2018	7
3	Rastriya Banijya Bank Limited	2012 - 2018	7
Foreign Ownership			
4	Standard Chartered Bank Nepal Limited	2012 - 2018	7
5	Nabil Bank Limited	2012 - 2018	7
6	Nepal SBI Bank Limited	2012 - 2018	7
7	Himalayan Bank Limited	2012 - 2018	7
8	Everest Bank Limited	2012 - 2018	7
9	Nepal Bangladesh Bank Limited	2012 - 2018	7
10	NMB Bank Limited	2012 - 2018	7
Private Ownership			
11	Nepal Investment Bank Limited	2012 - 2018	7
12	Nepal Credit and Commerce Bank Limited	2012 - 2018	7
13	Machhapuchhre Bank Limited	2012 - 2018	7
14	Kumari Bank Limited	2012 - 2018	7
15	Laxmi Bank Limited	2012 - 2018	7
16	Siddhartah Bank Limited	2012 - 2018	7
17	Mega Bank Nepal Limited	2012 - 2018	7
18	Prime Commercial Bank Limited	2012 - 2018	7
19	Sanima Bank Limited	2012 - 2018	7
20	Sunrise Bank Limited	2012 - 2018	7
Total observations			140