

## Financial Stability and Mortgage Based Lending in Banks: Evidence from Bangladesh

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***Abstract:** Financial stability of a bank is essential for economic development of any country. The study has been designed to find out the relationship between financial stability and mortgage based lending of Banks and thus, the impact of mortgage loan on the financial stability of the bank. For conducting the research, secondary data of 15 private commercial banks have been considered for the time frame 2010 to 2018. NPL rate has been used as dependent variable as a measure of financial stability of the bank. Mortgage loan ratio, liquidity, size, leverage, cost-income ratio, income diversity of bank and GDP growth, inflation have been selected as independent variables for multiple regression model. Mortgage loan ratio, liquidity, income diversity and inflation are negatively influenced on the NPL rate and positively related with financial stability. High cost income ratio reduces the profitability as well as financial stability. Mortgage loan ratio increases the financial stability and acts the way of financial inclusion of households.*

***Keywords:** Financial stability, Mortgage loan, Non-performing loan (NPL)*

### Introduction

Financial institutions are dealing with fund in the economy. Banks are providing fund for all economic development of a country. They provide loan to the deficit units by collecting savings from the surplus units. Sometimes, financial institutions can't collect the lending amount for the borrower's inability to repay the loan. The uncollected amount of loan is written off as non-performing loan. The increase of non-performing loan hampers the financial stability of the financial institutions. The default loan decreases the efficiency of banks. For reducing the default risk, banks are proving loans against the mortgage. But mortgage lending hampers the diversification opportunity. It is common belief that mortgage lending helps to increase financial stability of banks. Because the mortgage asset can be sold in the time of borrower's default. Mortgage lending diversifies the risk of the asset portfolio. But Most of the financial crises occur from the real estate business. In the crisis periods, mortgage lending has negative impact on the

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financial stability of the bank. Besides, mortgage lending is a way of financial inclusion by giving access to housing loan to all people.

The economic development has prospered by lending and borrowing. Debt has positive impact on the overall development of the country if it is used properly. Credit access helps people's living standard in the society. Financial institutions are lending fund for profit but excessive lending may be problem for the economy. The default risk may arise for highly indebtedness. It reduces the financial stability of the bank. Gross domestic product (GDP) growth rate of a country infers the overall development of the country. Lending fund make a bridge to the deficit units for economic development. Sometimes the lending may make financial institutions insolvent. The increase of non-performing loan (NPL) makes the bank financially instable. Most of the time mortgage loan adds the support of the bank but during financial crisis it facilitates the crisis.

The study delineates the relationship of mortgage loan with the financial stability of the financial institutions. The study is organized as the introduction in first section where there is an overview of corporate governance and operating performance of NBFIs. In the second section, it has shown the work of other researcher on this above mentioned related topic. Methodology of the study has been explained in the third section. Data analysis and findings are shown in the fourth section. Fifth section concludes the analysis. Deductive approach has been used for this study.

### ***1.1 Rationale of the study***

Banking sectors reaches the peak of its life cycle in Bangladesh and the economy mostly depends on the banking fund. A large number of banks make the banking business competitive in Bangladesh. If the banking industry crashes, the overall economy will fall in crisis. Banks are lending sometime with mortgage and sometime without mortgage. Mortgage asset can help to cover the default loan. Mortgage backed security may reduce the financial crisis. High level of competition makes the banking industry more vulnerable. For that reason banks are trying to sustain by less restricted services which may cause the financial crisis.

### **2.0 Literature Review**

The impact of mortgage lending on the financial stability of financial institutions has been proved by many researchers. Bordo & Jeanne (2002) conducted a study on the relationship of financial crisis and mortgage lending to the customers. They found that high housing price stimulates the financial crisis in the market. Claessens, Kose, & Terrones (2008) have analyzed the cause of recession in the economy. They have found that financial crisis is being dangerous when the housing price busts and in the period of credit crunch. Gerlach (2012) concluded that the price fall of housing property smoothes the way of financial crisis. The process of financial instability starts with the stagnant of

housing construction which increases the unemployment rate. High unemployment makes default among house owners. The weakness of the economy makes slows the banking transactions. When the banking activities are going down, the economic recession is knocking at the door.

Reinhart & Rogoff (2009) analyzed the banking crises of developed economics since the middle of 1970s century. They found that the financial crises of bank occur for the housing price busts. They claimed that last six banking crises have associated with the real estate sector. They also found that housing price busts and average 9% decrease of GDP with the financial crisis and the unemployment will increase around 7%. Government debt is also increased in the time of banking crisis.

IMF (2011) has conducted a study to find out the relation of financial stability and mortgage based housing finance. The research has been conducted on 36 developed and emerging countries for the time period from 2004 to 2009 by using the panel dataset. They have found that mortgage lending has negative relation with the NPL ratio during the financial crisis period. Although they find negative relation of mortgage lending and financial stability, the relations was statistically insignificant for the study. They also highlight the relation of mortgage lending with financial stability during non-crisis period. They believe that mortgage based lending has positive impact on the financial stability of bank.

Fang (2010) has shown two models for finding the relation of household debt and financial stability of that loan. The researcher finds in the first model that the housing loan rate decreases from the normal rate when the economy is going down and unemployment rate is going up. In another model, the researcher claim that the NPL rate of bank increases when the housing price declines. So the mortgage loan has positive effect on financial stability in non-crisis period in the economy.

Tsai & Peng (2011) conducted a study on housing price fluctuation in bubble period in China. They find that housing market bubble occurs due to high demand of housing market, money supply and stock price index. During housing market bubble, it is hard to own house due to the high price of house.

Dell'Ariccia, Igan, & Laeven (2008) have conducted a research on the credit boom and lending standards of subprime mortgage market in USA. They have found that credit standards are being decreased in USA during subprime crisis in 2007–2009. They also found that credit boom, housing price and lending standards have influenced on financial stability of an economy. As the credit growth increases, the standard of lending decreases and the financial position of banks are being instable.

Mian & Sufi (2009) analyzed the cause of mortgage default in USA. They have found that during financial crisis in USA subprime borrowers lost a lot. The number of

mortgage default is proportionately high as high of mortgage credit growth in different district. Mortgage loan defaulter is more in 2007 in USA where the mortgage credit booms.

Cacnio (2014) conducted a research on mortgage loan and financial stability in South East Asian Central Banks (SEACEN). The researcher considers 13 countries for the study. The findings of the research is that mortgage lending is not harmful for financial stability rather mortgage loan has positive impact on financial stability. In Asia region mortgage lending is more secured than non-mortgage lending for the financial institutions.

Kumar (2014) examined the determinants of non-performing loan (NPL) in India. He has used the micro level bank data for the research. He has found from the study that the portion of housing loan which is mortgage based has negative relation with NPL. NPL has been used as a measure of financial stability. Mortgage based loan increases the financial stability of banks.

Hsu & Yu (2014) conducted a research on mortgage NPL ratio of Taipei in China. They use the macro level data for the research. They have prepared a vector error correction model where mortgage loan NPL ratio is dependent variable and mortgage loan growth, real GDP, real interest rate and housing price are independent variable. They found that mortgage loan has positive correlation with mortgage NPL ratio in the short-run error correction model which is statistically significant. They conclude that the increase of mortgage loan growth is positive for the financial stability of banks.

Adasme, Majnoni, & Uribe (2006) analyzed the NPL of small and large organization. They found that the NPL of mortgage loan is not significant for small institution but the NPL of mortgage loan of large firm has large impact of financial stability. They have also added that infrequent loss of mortgage loan is not a threat of financial stability of financial institutions. The systematic risk of small fir is lower than that of large group. They concluded that the mortgage loan and SMEs loan helps to reduce the risk and increases the financial stability of financial institutions.

Cecchetti, Mohanty & Zampolli (2011) have shown the dual function of credit in the economy. Credit access helps household to increase the standard of living. Banks are also benefited from higher demand of loan. But excessive level of credit may break down the whole economy. People are being more tensed when they have higher debt burden. Their income is going down and unemployment rate is going up. And borrowers become unable to repay the loan to the bank which deteriorates the financial stability. They suggest that financial institutions should diversify the portfolio.

### **2.1 Objective of the study**

The research has been conducted to find out the impact of mortgage lending in financial stability of Banks. The following research objectives are formulated-

- i. To determine the factors affecting the financial stability of bank.
- ii. To find out the relationship of mortgage lending and financial stability of private commercial banks.
- iii. To understand the financial inclusion through mortgage lending.

### **3.0 Methodology of the Study**

Deductive research approach has been considered for this study. Data is collected from secondary sources and the data has analyzed in quantitative technique. For fulfilling the objective, quantitative research method has used.

#### **3.1 Data and Sampling**

For conducting the study, secondary data has been used which is collected from the annual reports of the banks. For data analysis, 15 private commercial banks have been considered from the population of 60 banks. The time frame of the study is 2010 to 2018. Bank level data has been collected from the annual report of the respective bank and the macro-economic level data such as GDP growth rate and inflation rate has been collected from the website of Bangladesh bank. The data has also been collected from DSE library, Bangladesh bank and several publications like books, magazines, trade journals & websites of the Banks.

#### **3.2 Regression Model for the Study**

A regression model helps to find out the relation and impact of independent variables on dependent variable. To measure the impact and relation of mortgage loan on the financial stability of the banks, a unique model has been developed.

$$Y = \alpha + \beta_1 X_{1i,t} + \beta_2 X_{2i,t} + \beta_3 X_{3i,t} + \beta_4 X_{4i,t} + \beta_5 X_{5i,t} + \beta_6 X_{6i,t} + \beta_7 X_{7t} + \beta_8 X_{8t} + \varepsilon$$

Where;

$Y$  = Non Performing Loan (NPL) in percentage form for bank  $i$  at time  $t$ ;

$\alpha$  = Constant value

$X_{1i,t}$  = Mortgage loan for bank  $i$  at time  $t$ .

$X_{2i,t}$  = Liquidity for bank  $i$  at time  $t$ .

$X_{3i,t}$  = Size for bank  $i$  at time  $t$ .

$X_{4i,t}$  = Leverage for bank  $i$  at time  $t$ .

$X_{5\ i,t}$  = Cost income ratio for bank i at time t.

$X_{6\ i,t}$  = Income diversity for bank i at time t.

$X_{7\ t}$  = GDP growth rate of the country at time t.

$X_{8\ t}$  = Inflation rate of the country at time t.

$\varepsilon$  = Error variable

### ***3.3 Definition of the variables***

#### **3.3.1 Financial Stability**

Financial stability is a condition where financial institution can endure the unfavorable shock from market. Financial institutions become instable when borrowers are unable to repay the loan principal. A lot of financial crises have occurred in the world. To minimize the financial crisis, regulators have been taken a lot of actions for financial surveillance. Last worldwide financial crisis in 2007 was helped to understand the necessity of financial stability in the economy. Subprime mortgage crisis occurred due to default of house owner. NPL ratio can be used for measuring financial stability of a bank. When NPL ratio increases of a bank, the bank is assumed financial unstable.

#### **3.3.2 Mortgage Loan**

Mortgage loan is defined as the loan provided to the client against the property collateral. If the borrower is unable to repay the loan amount, bank can settle the loan by selling the mortgage property. Mortgage ensures banks the financial stability in the economy. Banks provide mortgage loan amount based on the value of the property. But the property value may decrease in the time of financial crisis like subprime mortgage crisis. Mortgage loan amount is considered only the fully secured by property portion but not the personal guarantee. Mortgage loan ratio is calculated mortgage loan amount divided by total loan amount. Mortgage loan is negatively related with financial stability.

#### **3.3.3 Liquidity**

Liquidity refers quickly response of the demand of money by the customer. It is also defined as the ability to pay cash without taking much time. Bank's reputation depends on the liquidity of the bank. Banks can achieve customer's trust by quickly honoring their cheques. High liquidity of a bank reduces risk but it also makes obstacle for profitability of the bank. Bank should trade off the liquidity and profitability. Liquidity is expressed as the ratio of total current asset divided by the total deposits of the bank.

#### **3.3.4 Size of the bank**

Size may be weight or height but size of the firm infers the market capitalization share. Size of the firm has positive influence on the financial stability. Large size bank can diversify the portfolio and endure more loan default than small size bank. Large banks

have more fund and they can diversify the loan portfolio. Total asset of the bank is used as a proxy of the size of the firm. Natural logarithm of total assets has been used as size for the study.

#### 3.3.5 Leverage

The long term financing through debt capital is meant leverage. Leverage is necessary for expansion but high leverage has default risk. Leverage has negative relation with the financial stability. During recession, leverage stimulates the financial instability. Here the total debt to total asset ratio is considered as the leverage of the bank.

#### 3.3.6 Cost Income ratio

Cost income rate infers the profit margin of the bank. When the operating cost of the financial institutions increases, the profit margin will decrease. Provision for loan losses increases the cost which will reduce the profitability and make the bank financially instable. Cost income ratio has positive impact on the financial stability.

#### 3.3.7 Income Diversity

Banks are dealing with fund where the main source of income is interest. Banks are also providing a lot of services except lending. It is also a source of income for bank. Banks are diverting that service for diversification of risk. Income diversity of bank refers the total income from services except lending. Income diversity reduces the risk and has negative relation with the financial stability of the financial institutions. Income diversity is calculated one minus the absolute value of the portion of interest income from the total income of the bank.

#### 3.3.8 GDP Growth rate

Gross domestic product (GDP) infers the total goods and services value which is produced in a country's boundary in a year. The GDP growth rate infers the overall development of a country. GDP growth rate has positive relation with financial stability of financial institutions. GDP growth also add profit for the bank for more lending due to large economic development.

#### 3.3.9 Inflation

Inflation is defined as the increase of price level of the commodity. It reduces the purchasing power of the buyer. Inflation badly affects the economy. Financial stability of the bank is negatively affected by inflation. During inflation in the economy interest rate of borrowing is getting high, economic development is shrinking. Then the unemployment will increase which makes the financial market unstable. Yearly inflation rate is used for the study which is measured by using consumer price index. Inflation has negative relation with financial stability of the bank.

## 4.0 Empirical Analysis

### 4.1 Correlation Analysis

**Table 1: Correlation Matrix**

	NPL	Mortgage loan ratio	Liquidity	Size	Leverage	Cost income ratio	Income diversity	GDP growth	Inflation
NPL	1.000								
Mortgage loan	-0.137	1.000							
Liquidity	-0.044	-0.366	1.000						
Size	0.414	-0.064	0.174	1.000					
Leverage	0.157	-0.060	0.085	0.145	1.000				
Cost income ratio	0.150	-0.181	0.586	0.340	0.231	1.000			
Income diversity	-0.052	-0.110	0.330	0.257	-0.090	0.629	1.000		
GDP growth	0.384	-0.080	0.104	0.602	0.308	0.323	0.132	1.000	
Inflation	-0.489	0.059	-0.174	-0.673	-0.317	-0.289	0.011	-0.587	1.000

The correlation matrix shows the relation with variables which is used for the model to conduct the research. It shows the positive or negative relation with other selected variable. Size of the bank, leverage, cost income ratio and GDP growth rate are positively related with NPL of the bank. Large size banks are vulnerable in financial stability because they are providing more loans in the economic development of the country. High leverage and high cost income ratio creates more default risk for the bank. Mortgage loan ratio, liquidity, income diversity and inflation rate of the country negatively correlated with financial stability. Mortgage loan ratio and liquidity of the banks increases the financial stability of the bank. Income diversity reduces the risk and helps to add more income. High rate of inflation in the economy is not good for the economy of a country. When inflation increases, banks are aware of the economy and take steps for financial profitability and stability.



#### 4.2 Multicollinearity Tests

**Table 2: Variance Inflation Factor (VIF)**

Variables	VIF	1/VIF
Size	2.88	0.346728
Cost income ratio	2.85	0.350464
Inflation	2.28	0.437683
GDP growth	2.26	0.441800
Income diversity	2.09	0.478871
Liquidity	1.77	0.566258
Leverage	1.29	0.775133
Mortgage loan	1.17	0.857477
Mean VIF	2.07	

The variance inflation factor (VIF) measures the problem of multicollinearity in regression analysis model. The standard size of VIF is greater than the value 10 that is considered as of multicollinearity problem. If the VIF value is high, the model is biased by the multicollinearity problem. By using the Stata command, the VIF value of all variables is less the 10 which infers that the model is free from multicollinearity problem. Although there is no multicollinearity problem in the model, another test of multicollinearity is necessary for more accuracy. Multicollinearity can also be measured by correlation value of the variables.

To detect and exclude multicollinearity, it is necessary to investigate the correlation value between the independent variables. If the correlation value is higher than 0.70 (in either case positive or negative), the model is affected by multicollinearity problem. There is no multicollinearity problem among the variables if the correlation value is less than 0.70. From the correlation matrix no independent variable is correlated more than 0.70.

### 4.3 Multiple Regression Analysis

**Table 3: OLS Pooled Regression Model**

Variables	NPL
Mortgage loan	-0.0170325** (0.0072853)
Liquidity	-0.0784099 *** (0.0274992)
Size	0.0139059 (0.0104359)
Leverage	-0.0395778 (0.0739753)
Cost income ratio	0.0440349 * (0.0234124)
Income diversity	-0.0074909 * (0.0044917)
GDP growth	0.1256884 (0.2813817)
Inflation	-0.2773142 *** (0.0929199)
Constant	-0.0546552 (0.1400347)
N (Observations)	135
F	7.54
R-squared	0.3237
Adjusted R-squared	0.2808
*** Significant at the 1% level, ** significant at the 5% level, * significant at the 10% level. Notes: Robust standard errors are reported in parentheses.	

The multiple regression models are statistically significant where probability of F is 0.00000 which is less the 5% level of significance. The R square for the OLS regression is 32.37%. It infers that 32.37% of the variation in the NPL is explained by the eight selected variables included in the test. Adjusted R square adjusts all effect to the model.

Adjusted R square is more reliable to explain dependent variable of NPL with the change of independent variable. The adjusted R square for the OLS model is 28.08% which indicates that financial stability measured by NPL will be affected 28.08% due to the change in selected independent variables.

From the result, mortgage loan ratio, liquidity, cost income ratio, income diversity and inflation rate variables are statistically significance at different level. Liquidity of the bank and inflation rate of the economy is statistically significant at 1% level of significance where mortgage loan ratio is statistically significant at 5% level of significance. Cost income ratio and income diversity has statistically significant at 10% level of significance. Mortgage loan ratio is negatively correlated with NPL ratio which increases the financial stability. The coefficient infers that when mortgage loan ratio increases 1.7%, the NPL rate will decrease by 1% of that loan. Mortgage property ensures the financial stability of bank in non-crisis period. Liquidity has also negative relation with financial stability of the financial institutions which infers when liquid asset increases, the financial stability of bank will increase. Liquidity also increases the reputation of the bank but more liquid asset is not favorable for bank. Cost income ratio is another significant independent variable which is positively correlated with NPL. When the cost ratio increases over income, the financial position will be wiped out from the market. Income diversity comes from asset diversification of bank. The more diversified portfolio, the less risk of default. Income diversity has negative relation with financial stability which implies the default rate as well will decrease when banking income is more diversified. Inflation rate has negative correlation with NPL rate. During inflation, borrowers have to repay less real value and for that the NPL rate is low. Inflation has highest co-efficient which is highly influenced on financial stability of the bank. Although the independent variables are not statistically significant, they have also influenced on the financial stability of the financial institutions.

#### ***4.4 Hausman Test for Fixed Effect and Random Effect Model***

The fixed effect model considers the individual random variable effect on the explanatory variables. Here, the probability of F is less than 5% level of significance which indicates that the model is significant. Only liquidity and inflation rate is statistically significant variable. Both variables have negative impact on the NPL rate of the financial institutions.

Random Effect is a meta-analysis of both between and within variable analysis. In this model, the chi-square is less than 5% which indicates that the model is significant. Here the two independent variables are statistically significant where both liquidity and inflation rate has negative influence on the NPL rate.

Hauseman Test is the test of hypothesis that between the random effect model and the fixed effect model which one is appropriate. The Hausman test identifies the best fitting model for the study. The hypothesis of Hausman test is as follows-

Ho: Random Effect is appropriate

H1: Fixed Effect is appropriate

**Table 4: Hausman Test**

<b>Coefficients</b>				
	<b>(b) Fixed</b>	<b>(B) Random</b>	<b>(b-B) Difference</b>	<b>sqrt(diag(V_b-V_B)) S.E.</b>
Mortgage loan	0.014719	-0.0072695	0.0219884	0.0112204
Liquidity	-0.0818918	-0.0769514	-0.0049404	0.0157856
Size	-0.0058307	0.0062419	-0.0120725	0.0098746
Leverage	0.0074058	-0.0121099	0.0195157	0.0541148
Cost income ratio	0.0176659	0.0336581	-0.0159922	0.0141421
Income diversity	-0.0059548	-0.0065013	0.0005465	0.0012934
GDP growth	0.5065581	0.2591036	0.2474545	0.1530698
Inflation	-0.3758571	-0.3130365	-0.0628206	0.0455493
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\text{chi2}(8) = (b-B)'[(V_b-V_B)^{-1}](b-B)$ $= 6.28$				
Prob>chi2 = 0.6155				

The chi-square is greater than 5% which indicates that the null hypothesis can't be rejected. So the random effect model is appropriate for this study. The regression model is appropriately explained by random effect of variables. Random effect model provide wider confidence level for heterogeneous results.

#### 4.5 Random Effect Regression Result

**Table 5: Random Effect Regression Model**

Variables	NPL
Mortgage loan	-0.0072695 (0.0102313)
Liquidity	-0.0769514 *** (0.0297318)
Size	0.0062419 (0.0128601)
Leverage	-0.0121099 (0.0848472)
Cost income ratio	0.0336581 (0.0251393)
Income diversity	-0.0065013 (0.0043356)
GDP growth	0.2591036 (0.2888807)
Inflation	-0.3130365*** (0.0938651 )
Constant	-0.0043153 (0.1633399)
N (Observations)	135
Number of groups	15
R-squared	within = 0.3578 between = 0.0990 overall = 0.3062
sigma_u   0.0067301 sigma_e   0.01244415 rho   0.22630013 (fraction of variance due to u_i)	
*** Significant at the 1% level, ** significant at the 5% level, * significant at the 10% level. Notes: Robust standard errors are reported in parentheses.	

The random effect regression model is statistically significant where the probability of Wald chi-square test is less the 5% level of significance. Mortgage loan ratio has negative impact on NPL rate but it is not statistically significant. Only liquidity and inflation rate is statistically significant factor at 1% level of significance for financial stability. Both liquidity of the bank and inflation rate of a country has negative impact on the NPL rate. When the liquidity increases of a bank, the NPL rate will decrease and it means the financial stability will increase. Inflation rate has highest co-efficient with NPL rate. Inflation has negative relation with NPL rate of the bank. Inflation helps the bank become more financially stable. It is assumed that in the time of inflation period, borrowers have to repay less real amount although the nominal amount is same as stipulated. And for that reason every borrowers try their best to repay the fund during inflation. When inflation increases, banks are also increasing the interest rate. But during recession inflation may not able to retain the financial stability of the financial institutions. Other six independent variables are not statistically significant but they have positive and negative influence on the financial stability of the bank.

### **5.0 Findings of the Study**

Banking sector has become an inseparable part for the economy. To sustain in the competitive market, banks are doing business by relaxing the rules and conditions which makes the bank financially instable by increasing financial scandal. Financial scandal creates the financial crisis in the economy. From the study, it is found that mortgage loan ratio has a great impact on the financial stability of banks. Mortgage loan has negative impact on NPL rate. Moreover, mortgage loan decreases the default risk which increases the financial stability of the bank. On the other hand, liquidity of the bank increases the customer reliability. Customer's reliability which depends on bank's ability to meet short term obligations makes a bank financially stable in the banking industry. Highly levered firm has financial risk. Leverage is negatively affected the NPL rate of the bank. However, Debtors provide more restrictions for maintaining financial stability of the financial institutions. High cost ratio over income makes the bank loss position which affects the financial stability. When banks are diversifying their activities, the risk is also reduced. The earning is also stable during economic recession by providing noncore services to the customers. Income diversity makes the bank more financially stable. The demand of loan increases with the economic growth of the country. Inflation reduces the purchasing power of the people. However, inflation is favourable for borrower in the time of loan repayment because they have to pay less amount of real value of money. Therefore, inflation helps to increase financial stability of bank during non-crisis period but inflation stimulates the economic recession during crisis period.

### **6.0 Conclusion**

Stable banking sector reflects the economic position of a country. Therefore, financial stability of banks is crying need for the development of the economy. Risk can be

minimized by diversifying the asset classification of the bank whereas, mortgage loan ratio protects the NPL of the bank which increases the financial stability. Moreover, mortgage property ensures that the lending amount will be covered by selling the property. In addition, mortgage lending growth includes the households which have also been functioning as financial inclusion. Hence, high mortgage lending ratio increases the financial stability in non-crisis period but it smoothens the economic recession during financial crisis. So, Banks should maintain optimum mortgage ratio and consistently update with economic condition.

Furthermore, Income diversity of bank endures the economic shock while liquidity improves the customer loyalty which increases the profitability of the bank. On the other hand, optimum leverage helps profitability but high leverage may put the bank in financial distress. Large size banks have more market share than small size bank which increases the profitability. Again, inflation is not always desired by the economy because it reduces the value of money. Inflation helps to maintain financial stability of bank at a certain level. During inflation, borrowers have to repay less real value and for that the NPL rate is low.

Finally, it has found from the study that mortgage loan ratio has positive impact on maintaining the financial stability of the bank. Banks, regulators and policy makers should provide more emphasis on mortgage loan for reducing the financial scandal and maintain the financial stability. Further research can be done on the impact of mortgage loan on financial stability during crisis period.

## References

- Adasme, O., Majnoni, G. & Uribe, M. (2006). Access and Risk: Friends or Foes? Lessons from Chile. World Bank Policy Research Working Paper 4003. Washington, DC: World Bank.
- Bordo, M. & Jeanne, O. (2002). Monetary Policy and Asset Prices: Does “Benign Neglect” Make Sense. IMF Working Paper WP/02/225. Washington, DC: International Monetary Fund. [www.imf.org/external/pubs/ft/wp/2002/wp02225.pdf](http://www.imf.org/external/pubs/ft/wp/2002/wp02225.pdf) [Accessed 6 Jan. 2019].
- Cacnio, F. (2014). *Mortgage Finance and Consumer Credit: Implications on Financial Stability in SEACEN Economies*. Kuala Lumpur, Malaysia: SEACEN Centre.
- Cecchetti, S., Flores-Lagunes A. & Krause, S. (2004). Has Monetary Policy Become More Efficient? A Cross Country Analysis. NBER Working Papers, No. 10973.
- Cecchetti, S., Mohanty, M. S. & Zampolli, F. (2011). The Real Effects of Debt. BIS Working Papers, No. 352.
- Claessens, S., Kose, M. & Terrones, M. (2008). What Happens during Recessions, Crunches and Busts? IMF Working Paper WP/08/274. Washington, DC: International Monetary Fund. [www.imf.org/external/pubs/ft/wp/2008/wp08274.pdf](http://www.imf.org/external/pubs/ft/wp/2008/wp08274.pdf) [Accessed 6 Jan. 2019].

- Crowe, C., Igan D., Dell'Aricecia G. & Rabanal P. (2011). *Policies for Macroeconomic Stability: Options to Deal with Real Estate Booms*. IMF Staff Discussion Notes 11/02. Washington: IMF, March 1.
- Dell'Aricecia, G., Igan, D. & Laeven, L. (2008). Credit Booms and Lending Standards: Evidence from the Subprime Mortgage Market. IMF Working Paper WP/08/106. Washington, DC: International Monetary Fund. [www.imf.org/external/pubs/ft/wp/2008/wp08106.pdf](http://www.imf.org/external/pubs/ft/wp/2008/wp08106.pdf) [Accessed 11 Jan. 2019].
- Fang, H. J. (2010). *Household Indebtedness and Its Implications to Financial Stability in Taiwan*. SEACEN Research Paper, No. 80, August.
- Gerlach, S. (2012). Housing Markets and Financial Stability. Speech at the National University of Ireland, Galway. Dublin: Bank of Ireland. 20 April.
- Hsu, P. C. & Yu, Y. (2014). Chapter 13 in *Mortgage Finance and Consumer Credit: Implications on Financial Stability in SEACEN Economies*, edited by F. Cacnio. Kuala Lumpur, Malaysia: SEACEN Centre. pp. 341–371.
- International Monetary Fund (IMF). (2006). Household Credit Growth in Emerging Market Countries. In *Global Financial Stability Report: Market Developments and Issues*. Washington, DC: International Monetary Fund. September. pp. 46–73.
- IMF. (2011). Housing Finance and Financial Stability—Back to Basics? In *Global Financial Stability Report: Durable Financial Stability: Getting There from Here*. Washington, DC: International Monetary Fund. April. pp. 111–157. [www.imf.org/external/pubs/ft/gfsr/2011/01/pdf/chap3.pdf](http://www.imf.org/external/pubs/ft/gfsr/2011/01/pdf/chap3.pdf) [Accessed 10 Jan. 2019].
- Kumar, R. (2014). Mortgage Finance and Consumer Credit: Implications on Financial Stability. In *Mortgage Finance and Consumer Credit: Implications on Financial Stability in SEACEN Economies*, edited by F. Cacnio. Kuala Lumpur, Malaysia: SEACEN Centre. pp. 69–88.
- Mian, A. & Sufi, A. (2011). House Prices, Home Equity-Based Borrowing, and the US Household Leverage Crisis. *American Economic Review*, 101( 5), pp. 2132-56.
- Mian, A. & Sufi, A. (2009). The Consequences of Mortgage Credit Expansion: Evidence from the US Mortgage Default Crisis. *Quarterly Journal of Economics*, 124(4), pp. 1449–1496.
- Reinhart, C. & Rogoff, K. (2009). *This Time Is Different: Eight Centuries of Financial Folly*. Princeton, New Jersey, and Oxford, UK: Princeton University Press.
- Tsai, B. H. (2010). Gauging Bank Efficiency During Card Insolvency Crisis: The Case of the Taiwanese Banks. *Journal of Developing Areas*, Fall.
- Tsai, I. C. & Peng, C. W. (2011). Bubbles in the Taiwan Housing Market: The Determinants and Effects. *Habitat International*, 35.