

CYCLICALITY OF NON-PERFORMING ASSETS: EVIDENCE FROM INDIAN BANKING INDUSTRY

Payal Goel*

Abstract

Purpose: The paper aims to discern the cyclical appearance of the Non-Performing Assets with special emphasis to the Indian Banking Industry. It further aims to determine what factors cause such behaviour of the Non-Performing Assets. Also, an attempt has been made to make a comparison in between Public sector, private sector and foreign sector banks.

Design/Methodology/Approach: Descriptive research is employed to fulfill the said objectives. Both external (macro-economic variables such as business cycle shocks, current state of the economy, expected and unexpected growth of the economy) and internal (bank specific variables such as loan interest rates, proportion of unsecured loans to total loans, size, leverage, term loans, cost conditions, credit to deposit ratio, secured and unsecured lending) variables are regressed on the net performing assets of Indian public sector, private sector and foreign banks. Panel data regression has been applied on three categories of banks for a period of thirteen years from 2004-05 to 2016-17.

Practical Implications: The study helps the regulators in estimating that how the macro-economical variables such as business cycle events can change the conduct of NPAs. It also helps banks in determining the important factors that may cause the cyclical behaviour of their non-performing assets and adopt the strategies to mitigate the problem of NPAs accordingly.

Research Limitations: The study is restricted to the Indian sector only. A comparison with other emerging nations can also be made. The scope of the study is restricted to limited variables for a specific period of time.

Originality/Value: The paper brings the most recent empirical results related to Indian banking industry. The behaviour of NPAs is examined and possible reasons for such conduct is discerned. Additionally, complete banking industry of India including all types of scheduled commercial banks have been taken bringing the most comprehensive picture of the present situation.

Keywords: Non-Performing Assets, Business Cycle, Macro-Economy, Bank Loans

INTRODUCTION

The economic position of a country largely depends on the Banking sector. The commercial banks play a pivotal role in regulating the flow of funds throughout the economy. The banks primary function is to accept the deposits from general public and lend advances. The main source of income for the banks is the interest due on advances due to which loans and advances become the assets of the bank. It becomes imperative to keep an eye on maintaining the quality of such assets. However, the credit given by banks is not free of any risks. One of the major credit risk suffered by banks and financial institutions is when borrowers fail to pay back the principal component and interest due on loans. Such assets are known as Non-Performing Assets (NPAs).

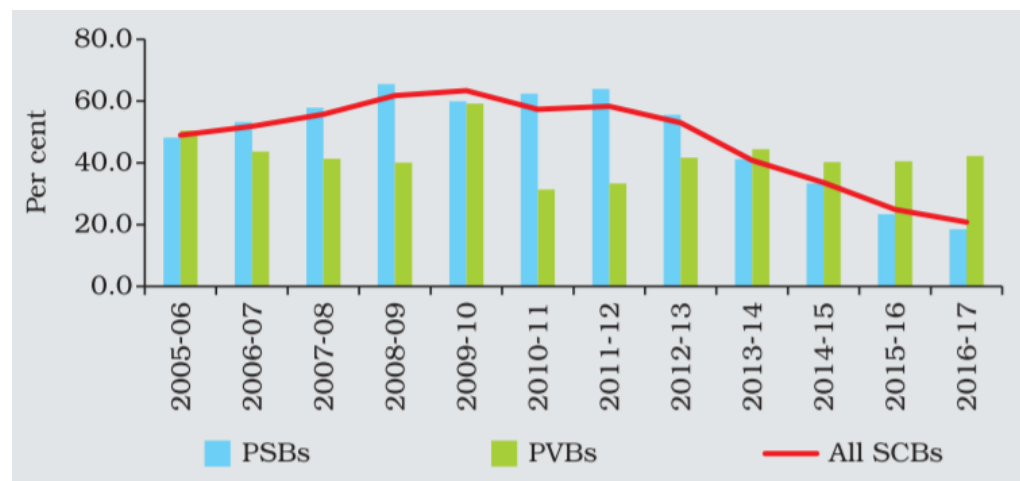
NPAs are considered as foremost indicator of poor asset quality of banks. Poor asset quality affects profitability, solvency and liquidity position consequently disturbing the financial health of the banks (Balasubramaniam, 2012, Durafe and Singh, 2016). As on 31st March, 2017, the gross non performing assets of Indian banks stand at an alarming level of 9.3% of total advances amounting to 7,91,800 crore Rupees¹. The abysmal verity is that such non performing assets can never be eliminated completely. As a result, recovery of NPAs has brought serious attention of the Government of India leading to the enactment of Corporate Debt Restructuring, Joint Lender's forum, amendment

1 Source: Statistical Tables Relating to Banks in India, 2017. Retrieved from <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications#!4>

* Junior Research Fellow, University Business School, Panjab University, Chandigarh, India. Email: payalgoel.ubs@gmail.com

to SARFAESI Act, 2002, strategic debt restructuring and sustainable structuring of stressed assets. In spite of taking such measures, the non performing assets could not be recovered up to a satisfactory level. As it can be seen in Figure 1, the recovery of GNPA's is declining consistently from past thirteen years. If the same situation persists for a long period of time, it may hamper the growth of the banks.

When the non performing assets exceed a threshold level, it gives a negative implication on the capital adequacy reserve requirements leading to a diminished willingness of bank to lend advances (Tracey, 2011). As a result, it hampers the economic activity of a nation specially during times of financial distress (Messai and Jouini, 2013).



Source: Report on Trend and Progress of Banking in India

Fig. 1: Recovery of Gross Non-Performing Assets

The banking sector of India has witnessed to be a major victim of the recent financial crisis of 2007-2008 (Mohan, 2008). The reduced lending due to financial crisis leads to the slowdown of the monetary expansion of the economy both on demand as well as on supply side (O'Brien and Browne, 1992). The financial crisis highlighted the cyclical behaviour of the banking industry (Gonzales, 2009). During the period of expansion, banks tend to be optimistic regarding the reduction of non performing assets due to which they keep less loan loss provisions and lend more advances. Inversely, the pessimistic behaviour of banks during periods of economic downturns make them highly skeptical about the borrowers willingness to pay back the loan due to which they expect higher NPAs and lend less advances (Samantaraya, 2007). The present study aims to examine the cyclical behaviour of banks related to the non performing assets with respect to the economic cycles. The remaining paper is organised into four sections. The second section briefly describes the literature review of past studies and entails the research gap, third section explains the research methodology, fourth section describes the empirical results obtained from applying the econometric model and fifth section concludes.

REVIEW OF LITERATURE

The economic growth of a nation is largely determined by the progress of its financial sector (Singh, 2005). The

advancement of the banks and financial institutions acts as a boost for a country prosperity, rather both are complimentary to each other (Rajan and Zingales, 1998; Koivu, 2002). Empirical studies support the notion that a stability in the financial sector is required for the economic development (Levine, 1997, 2005; Amaral and Quintin, 2007; Rajeev and Mahesh, 2010). The banks and financial institutions can be regarded as financially stable only when they are able to induce mobility of financial resources from surplus units to deficit units, manage the predictable financial risks, and has the capacity to absorb the real economic shocks (Swamy, 2012). Banks comprise the major portion of the financial sector of a country and performance of such banks is determined by their asset quality. Several macro-economic variables such as inflation, foreign exchange rate, capital flows etc. affect the asset quality of banks (Lis *et al.*, 2000).

One of the imperative macro economic indicator is the state of economy or business cycle. During upswings of the economy, the balance sheets of banks tend to be strong leading to increased supply of money by way of loans and advances and vice versa during downturns (Bock and Demyanets, 2012). As a result it leads to increased severity of non performing assets. Business cycles are considered as the foremost reason for the increase in non performing loans (Sergio, 1996). Similarly weak markets, prolonged recessions, inflation levels and negative growth of per capita income induces the cyclicity in the non performing assets

of the banks (Salas and Saurina, 2001; Swamy, 2012). Similar results were obtained in major economies of world such as Australia (Gizycki, 2001), Eurozone (Makri et al., 2014).

However, the increase in NPAs as a result of economic conditions alone was not empirically established. The banks lending practices, unguaranteed loans, inadequate loan loss provisions are also responsible for increased bad debts (Bloem and Gorter, 2001). Additionally, bank specific indicators also give a significant impact on the non performing assets. Larger banks tend to bear smaller NPAs as compared to small size banks (Ranjan and Dahl, 2003). Empirical evidences support the notion that if banks preserve high capital adequacy ratio then the probability of suffering from non performing assets may reduce (Das and Ghosh, 2007). In contrast, return on assets give a significant positive effect on the non performing assets (Vatansever and Hepsen, 2013). The banks by adopting the countercyclical measures can curb the problem of cyclicality and maintain a stable growth rate.

RESEARCH METHODOLOGY

Sample Selection and Data Sources

An attempt has been made to cover the complete banking industry in India. Due to which, data for all public sector banks, private sector banks and foreign banks have been taken. The banks for which the data was not available and that ceased to exist before 2017 were deleted. Therefore, 27 public sector banks comprising of 338 observations, 18 private sector banks making 234 observations and 12 foreign sector banks making comprising 156 observations constitutes the sample of the study.

The data is analysed for a period of thirteen years ranging from 2004-05 to 2016-17. This period is imperative to analyse as major banking sector reforms have been taken place under such period. The Indian economy has witnessed major upswings and downturns over last decade. Also, a huge growth in the Gross Domestic Product of India has been observed. From once being known for sluggish growth rate now India is known to be the fastest growing economy of the world. Thus, it becomes crucial to analyse the cyclical conditions of the economy and its impact on the non performing assets of the banks. Further, official websites of commercial banks and Reserve Bank of India constitute the main data source for the study.

Variable Description and Selection

Dependent Variable

The non performing assets of a bank is the one that ceases to generate income for the banks. The assets of a bank are divided into four categories. Standard assets are those on which both interest and principal amount is received before 90 days. Sub-standard assets are those on which remain NPA for a period of less than or equal to twelve months. Doubtful assets are those which remain sub-standard asset for a period of 12 months. Loss assets is the one whose loss is being identified by either an internal or external auditor. For empirical analysis, Gross NPA to Advances ratio serves as a proxy to measure NPA. Table 1 gives a glance of non performing assets of Indian Banking industry.

Table 1: Classification of NPAs

(Amount in ₹ billion)

Bank Group	Year	Standard Assets		Sub-Standard Assets		Doubtful Assets		Loss Assets	
		Amount	Per cent*	Amount	Per cent*	Amount	Per cent*	Amount	Per cent*
PSBs#	2016	52,875	90.7	2,005	3.4	3,232	5.5	163	0.3
	2017	51,816	88.3	1,731	3.0	4,904	8.4	213	0.4
PVBs	2016	19,184	97.2	186	0.9	311	1.6	62	0.3
	2017	21,748	95.9	310	1.4	519	2.3	90	0.4
FBs	2016	3,606	95.8	62	1.6	60	1.6	36	0.9
	2017	3,304	96.0	40	1.2	83	2.4	14	0.4
All SCBs	2016	75,666	92.5	2,252	2.8	3,603	4.4	260	0.3
	2017	76,868	90.7	2,081	2.5	5,505	6.5	316	0.4

Notes: 1. Constituent items may not add up to the total due to rounding-off.
2. *: As per cent to gross advances.
3. #: Includes IDBI Bank Ltd. and Bharatiya Mahila Bank.

Source: Report on Trend and Progress of Banking in India

Independent Variables

External factors

To examine the cyclicity of non-performing assets, economic cycle is used as the key variable. To enhance the results four alternate measures of economic cycle is considered (Misra and Dhal, 2012):

Business Cycle: Business cycle refers to the economy wide fluctuations. The period wise fluctuations in the aggregate economic activity is collectively known as business cycle. Detrended Gross Domestic Product using Hodrick Prescott filter serves as the proxy to measure business cycle.

GDP: The current Gross Domestic Product is also taken as an independent variable in the study. During expansionary phases as measured by increasing GDP, the borrower's ability to pay off the loans and advances increased leading to reduced NPAs.

Expected Growth: The expected growth of the economy as measured by one period lag of gross domestic product has an inverse relationship with non performing assets of the banks.

Unexpected growth: The another alternative measure of business cycle is the unexpected growth of the economy. It is measured as the difference between actual GDP and expected growth of GDP.

Internal factors

The factors specific to the banks is also regressed on the gross NPAs. If banks give more credit as compared to the deposits being accepted, the chances of facing the NPAs increases. Therefore, the credit to deposit ratio has a positive impact on NPAs. Past literature exert that as the size of bank increases the tendency to suffer from non performing assets decreases. The size of the bank is measured as the total assets as on the last day of the financial year. Additionally, the banks that maintain higher capital adequacy ratio in order to preserve themselves from future bad debts are found to be significantly safer to the credit risk. Therefore, capital adequacy ratio has a negative relationship with non performing assets. Further, additional measures are also taken into account such as borrowings, intermittent cost conditions, interest and non interest income, nature of lending such as secured or priority sector lending, the extent of long term advances given by the banks and the capital structure of banks as measured through leverage.

Econometric Model

Both internal and external factors have been regressed on the gross non-performing assets to advances ratio for

public, private and foreign sector banks respectively. Panel regression has been applied based on the following econometric model.

$$GNPA = \alpha + \beta_1 BC + \beta_2 GDP + \beta_3 EG + \beta_4 UEG + \beta_5 CDR + \beta_6 Size + \beta_7 CAR + \beta_8 BOR + \beta_9 CC + \beta_{10} IC + \beta_{11} NIC + \beta_{12} PL + \beta_{13} SL + \beta_{14} TL + \beta_{15} LEV$$

where,

GNPA = Gross non performing assets to advances ratio

BC = Business cycle

GDP = Actual gross domestic product

EG = Expected growth of GDP

UEG = Unexpected growth of GDP

CDR = Credit to deposit ratio

Size = Bank size

CAR = Capital adequacy ratio

BOR = Borrowings other than from RBI

CC = Cost condition

IC = Interest income

NIC = Non-interest income

PL = Priority sector lending

SL = Secured lending

TL = Term loans

LEV = Leverage

EMPIRICAL RESULTS

Table 2 depicts the regression results of public sector banks. The results suggests that if the economic cycle is measured through gross domestic product, the cyclical appearance of non-performing assets can be observed. However, it cannot be observed through other measures of business cycle. In case of internal factors, the results are contradictory to the previous results. Borrowings, cost conditions, non interest income, secured lending and term loans positively affect the gross NPAs whereas capital adequacy ratio, credit to deposit ratio, interest income significantly give a negative impact on NPAs. Additionally, the NPAs are larger in case of small banks and smaller for large banks thus consistent with the past studies.

Table 2: Results of Multiple Regression of Public Sector Banks

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.095711	0.034061	2.809999	0.0053
BUSINESSCYCLE	-1.44E-06	2.46E-07	-5.864706	0.0000
GDP	2.15E-06	2.07E-07	10.39937	0.0000
EG	-9.01E-07	1.87E-07	-4.826137	0.0000
UNEG	-7.59E-07	2.47E-07	-3.075238	0.0023
BOR	5.09E-08	1.77E-08	2.882660	0.0042
CC	0.022591	0.004886	4.624060	0.0000
CAR	-0.004348	0.001362	-3.191411	0.0016
CD	-0.000408	0.000100	-4.073825	0.0001
IC	-0.026276	0.002114	-12.43073	0.0000
LEV	1.16E-05	0.001427	0.008143	0.9935
NIC	0.001732	0.005530	0.313127	0.7544
PL	0.001514	0.000350	4.322253	0.0000
SL	0.000845	0.000272	3.103813	0.0021
TL	-1.98E-06	0.000168	-0.011792	0.9906
SIZE	-6.51E-09	1.90E-09	-3.426281	0.0007
R-squared	0.720562	Mean dependent var		0.039266
Adjusted R-squared	0.707545	S.D. dependent var		0.044178
S.E. of regression	0.023890	Sum squared resid		0.183771
F-statistic	55.35428	Durbin-Watson stat		1.428426
Prob(F-statistic)	0.000000			

Table 3 depicts the regression results of private sector banks. The results suggests that if the economic cycle is measured through gross domestic product, the cyclical appearance of non-performing assets can be observed. It suggests that NPAs of private sector banks move in tandem with the state of the economy. The results of private sector banks are

similar to public sector banks. Capital adequacy ratio, credit to deposit ratio, interest and non interest income, leverage negatively affects the NPAs. However, other variables such as priority sector lending and cost conditions are positively related to NPAs.

Table 3: Results of Multiple Regression of Private Sector Banks

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.147102	0.035058	4.195981	0.0000
BUSINESSCYCLE	3.81E-07	2.88E-07	1.324244	0.1868
GDP	5.81E-07	2.62E-07	2.222274	0.0273
EG	-5.04E-07	2.35E-07	-2.142297	0.0333
UNEG	-3.54E-07	2.99E-07	-1.183102	0.2381
BOR	8.05E-08	1.68E-08	4.791361	0.0000
CC	0.016959	0.004138	4.098764	0.0001
CAR	-3.38E-06	0.000395	-0.008566	0.9932
CD	-0.000955	0.000237	-4.036176	0.0001
IC	-0.002885	0.002175	-1.326201	0.1862
LEV	-0.000443	0.000226	-1.965175	0.0507
NIC	-0.013358	0.004768	-2.801737	0.0055
PL	0.000541	0.000326	1.659096	0.0985
SL	-0.000540	0.000273	-1.980975	0.0489
TL	-0.000335	0.000162	-2.068330	0.0398

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SIZE	-6.11E-09	2.90E-09	-2.109338	0.0361
R-squared	0.335935	Mean dependent var		0.020755
Adjusted R-squared	0.290242	S.D. dependent var		0.028855
S.E. of regression	0.024309	Sum squared resid		0.128825
F-statistic	7.352063	Durbin-Watson stat		1.107137
Prob(F-statistic)	0.000000			

Table 4 depicts the regression results of foreign sector banks. The results suggests that if the economic cycle is measured through gross domestic product, the cyclical appearance of non-performing assets can be observed. The NPAs of foreign banks in India are also affected by the business cycle shocks of India. Contrary to public and private sector banks,

if the size of foreign banks in India is large, the probability of suffering from credit risk as measured through NPAs also increases. Majority of the factors give a significant positive effect on the NPAs. It suggests that the foreign banks are more prone to the adverse effects of business cycle shocks.

Table 4: Results of Multiple Regression of Foreign Sector Banks

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.011348	0.041478	-0.273599	0.7848
BUSINESSCYCLE	5.22E-06	1.23E-06	4.252327	0.0000
GDP	-2.13E-06	1.21E-06	-1.758376	0.0809
EG	1.19E-06	1.05E-06	1.130316	0.2603
UNEG	-1.13E-06	1.31E-06	-0.857441	0.3927
BOR	6.13E-07	1.22E-06	0.501281	0.6170
CC	1.13E-07	2.32E-07	0.485643	0.6280
CD	-0.000389	0.000344	-1.130645	0.2601
IC	-0.002739	0.004081	-0.671100	0.5033
LEV	0.001701	0.000638	2.667368	0.0085
NIC	0.000508	0.000287	1.771335	0.0787
PL	0.001807	0.000348	5.193322	0.0000
SL	0.002313	0.000763	3.030906	0.0029
TL	-0.001973	0.001701	-1.160038	0.2480
SIZE	6.77E-08	1.08E-07	0.624878	0.5331
R-squared	0.394172	Mean dependent var		0.062587
Adjusted R-squared	0.334019	S.D. dependent var		0.112692
S.E. of regression	0.091966	Akaike info criterion		-1.843592
Sum squared resid	1.192533	Schwarz criterion		-1.550336
Log likelihood	158.8002	Hannan-Quinn criter.		-1.724484
F-statistic	6.552815	Durbin-Watson stat		0.570223
Prob(F-statistic)	0.000000			

CONCLUDING REMARKS

It is not wrong to imply that banking industry is prone to the adverse effects of the business cycle shocks. The asset quality of a bank measures the soundness of its financial health. All other measures such as liquidity, profitability and solvency position of the bank is affected by the asset quality. Non-performing assets are a serious problem for the banks and from last decade, the NPAs are increasing

at an alarming rate. Thus, it becomes crucial for the banks to keep a surveillance check on the credit risk to mitigate the problem of NPAs. Though, NPAs move in tandem with the state of the economy. If the economy is in expansionary phase, banks tend to get optimistic, they lend more and their chance of getting hit by default risk increases. Inversely, during economic downturns, because banks tend to get pessimistic, they lend less and the NPAs are also reduced. This situation may not be fully in control of the banks.

However, they should control the bank specific variables. By maintaining high capital adequacy ratio, keeping high leverage and earning more net interest income can improve their position regarding NPAs. Also, the banks should rely less on long term loans and should prefer secured lending in order to avoid NPAs.

Though, a large number of variables have been considered in the present study but there could be other factors that affect the NPAs of banks. As it is observed that the problem of NPAs cannot be eliminated completely, the future research must exert the efforts on devising the measures to minimise the credit risk and suggest strategies to ensure faster recovery from NPAs.

REFERENCES

- Amaral, P. S., & Quintin, E. (2007). Financial intermediation and economic development: A quantitative assessment. Conference on Latin America's Total Factor Productivity Puzzle.
- Balasubramaniam, C. S. (2012). Non-performing assets and profitability of commercial banks in India: Assessment and emerging issues. *National Monthly Refereed Journal of Research in Commerce & Management*, June(1), 41-52.
- Bloem, A. M., & Goerter, C. N. (2001). The macroeconomic statistical treatment of non-performing loans. In *Statistics Department of the International Monetary Fund Discussion Paper*.
- Das, A., & Ghosh, S. (2007). Determinants of credit risk in Indian state-owned banks: An empirical investigation. *Econ Issue*, 12, 48-66.
- De Bock, R., & Demyanets, M. A. (2012). *Bank asset quality in emerging markets: Determinants and spillovers* (No. 12-71). International Monetary Fund.
- De Lis, S. F., Pagés, J. M., & Salas, J. S. (2000). *Credit growth, problem loans and credit risk provisioning in Spain*. Banco de España, Servicio de Estudios.
- Durafe, A., & Singh, M. (2016). Cyclical Behavior of public and private sector banks: A comparative study of non-performing assets. *Journal of Business and Management Research*, 1(1), 14-25.
- Gonzales, J. E. (2009). The fundamentals of procyclicality of the financial system. *BSP Economic Newsletter*, 3, 1-5.
- Koivu, T. (2002). Do efficient banking sectors accelerate economic growth in transition countries.
- Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature*, 35(2), 688-726.
- Levine, R. (2005). Finance and growth: Theory and evidence. *Handbook of Economic Growth*, 1, 865-934.
- Makri, V., Tsagkanos, A., & Bellas, A. (2014). Determinants of non-performing loans: The case of Eurozone. *Panoeconomicus*, 61(2), 193.
- Messai, A. S., & Jouini, F. (2013). Micro and macro determinants of non-performing loans. *International journal of economics and financial issues*, 3(4), 852.
- Mohan, R. (2008). Global financial crisis and key risks: impact on India and Asia. *RBI Bulletin*, 2003-2022.
- O'Brien, P. F., & Browne, F. (1992). *A "Credit Crunch?": The Recent Slowdown in Bank Lending and Its Implications for Monetary Policy* (Vol. 107). Paris: OECD.
- Rajan, R., & Dhal, S. C. (2003). Non-performing loans and terms of credit of public sector banks in India: An empirical assessment. *Occasional Papers*, 24(3), 81-121.
- Rajan, R., & Zingales, L. (1998). Financial development and growth. *The American Economic Review*, 88(3), 559-586.
- Rajeev, M., & Mahesh, H. P. (2010). Banking sector reforms and NPA: A study of Indian commercial banks. The Institute for Social and Economic Change, Working Paper 252, ISBN 978-81-7791-108-4
- Samantaraya, A. (2007). *An empirical analysis of procyclicality of bank credit in India: Role of Basel prudential norms*. Paper presented at the 43rd annual conference of the Indian Econometric Society, IIT, Mumbai. Retrieved from <https://rbidocs.rbi.org.in/rdocs/content/pdfs/sssy280509.pdf>
- Sergio, M. (1996). Non-performing bank loans: Cyclical patterns and sectoral risk. *Review of Economic Conditions in Italy*. Rome: Jan-Jun 1996, Issue. 1
- Singh, C. (2004). Financial sector reforms and state of Indian economy. *Indian Journal of Economics and Business*, 3, 215-239.
- Swamy, V. (2012). Impact of macroeconomic and endogenous factors on non performing bank assets. *International Journal of Banking and Finance*, 9(1).
- Tracey, M. (2011, September). The Impact of Non-performing Loans on Loan Growth: An econometric case study of Jamaica and Trinidad and Tobago. In *Bank of Jamaica Applied research Conference in Jamaica September*.
- Vatanserver, M., & Hepsen, A. (2013). Determining impacts on non-performing loan ratio in turkey. *Journal of Finance and Investment Analysis*, 2(4) 119-129.