ISSN 2775-9237 (Online)

Asian Institute of Research Economics and Business Quarterly Reviews

Vol. 5, No.2 June 2022







Asian Institute of Research Economics and Business Quarterly Reviews Vol.5, No.2 June 2022

Table of Contents	i
Economics and Business Quarterly Reviews Editorial Board	iii
Cash Flow and Capital Account Liberalization on some Nigerian Firms' Investment Growth: The Sequel (Disaggregated Approach) Ewere F.O. Okungbowa, Anthony I. Monye-Emina, Aderoju S. Oyefusi	1
A Panel Data Analysis into the Impact of Regulations and Supervision on the African Banking Profitability and Risk Profile Nkhangweleni Masindi, Paul Singh	16
Remuneration, Organizational Commitment, and Job Satisfaction: The Effects on Lecturer Performance A Study at UPN Veteran Jawa Timur Kustini Kustini, Sugeng Purwanto, Daisy Marthina Rosyanti	31
Impact of News Related to Covid-19 on Stock Market Returns in Five Major ASEAN Countries Dadan Rahadian, Wina Nurfitriani	39
An Empirical Survey of the Relationship between Transformational Leadership and Staff Retention in the Context of Microfinance Institutions in Kenya Josphat K. Kariuki, Eunice N. Wandiga, Wilson O. Odiyo	39
The Macroeconomic-Based Systemic Risks and Bad Loans of Commercial Banks Listed in the Indonesian Capital Market Helmi Setiawan Muhammad, Erie Febrian, Bram Hadianto	70
Perceived Ease of Utilization, Usefulness, Security, and Trust in Mobile Banking Sherlen Tertia, Anny Nurbasari	76
The Effect of Intellectual, Emotional, and Spiritual Intelligence on the Ethical Behavior of Accounting Students Rachma Etika Dwi Yuniar, Nur Sayidah	83
Enterprise Risk Management and Bank Performance: A Study of the Indonesian Banking Industry Lauw Tjun Tjun, Yuswar Z. Basri, Yvonne Augustine	94
The Mediating Effect of Psychological Empowerment on the Relationship between Transformational Leadership and Staff Retention in Microfinance Institutions in Kenya	105

Josphat K. Kariuki, Eunice N. Wandiga, Wilson O. Odiyo

Economics and Business Quarterly Reviews ISSN 2775-9237 (Online)

Relationship between Socio-Economic Factors and Participation in Decision Making in Tourism Industry among Women in Zanzibar Fadhila Hassan Abdalla, Asnarulkhad Abuu Samah, Ahmad Hariza Hashim, Moh'd Roslan Rosnon	124
From Plato to e-Leaders: The Evolution of Leadership Theories and Styles Murillo de Oliveira Dias, Juliana Pan, Patrícia Vieira, Leonardo José Dias Pereira	133
Impact of Earnings Per Share on Stock Prices and Price to Earnings Ratio Khurshid Ali, Khalid Ashraf Chisti, Irshad Ahmad Malik	147
The Role of Financial Structural Factors in Retail Rate Adjustment: Evidence from Sri Lanka Antonette Fernando	153
Adaptation Level of Small Enterprises to the Covid-19 Pandemic in Lebak Regency, Banten Province, Indonesia Suherna, Gugun Gunawan	172
Application of Theory of Planned Behavior (TPB) in Cryptocurrency Investment Prediction: A Literature Review Muazila Norisnita, Fibria Indriati	181
Effects of Covid-19 Pandemic on Online Shopping Behavior in Iran Reza Ghaffari, Kequn Cheng	189
Corruption and Demography during the COVID-19 Pandemic in Indonesia Prima Naomi, Iqbal Akbar, Faris Budiman Annas	201
The Role of Organizational Commitment as a Mediator of Burnout Syndrome and Turnover Intention Nur Laily, Hening Widhi Oetomo, Juwita Sari, Wimba Respatia	214
An Empirical Test of The Financial Ratio Effect on Financial Distress in Indonesia (Study in Garment and Textile Industry) Dihin Septyanto, Nadia Figrita Welandasari, Nur Sayidah	222
Influence of Capital on Firm Value Through Enterprise Risk Management in Banking Dewi Kartikasari, Fatchan Ahyani, Zulfikar	231

Economics and Business Quarterly Reviews ISSN 2775-9237 (Online)

Economics and Business Quarterly Reviews Editorial Board

Editor-In-Chief

Prof. Alexandros Psychogios (United Kingdom)

Editorial Board

Prof. Dr. Vica Davidaviciene (Lithuania) Prof. Cosimo Magazzino (Italy) Prof. Dr Roselina Binti Ahmad Saufi (Malaysia) Assistant Prof. Ali Faruk Acikgoz (Turkey) Assoc. Prof. Kherchi Ishak (Algeria) Assoc. Prof. Dr. Juan Ignacio Pulido-Fernández (Spain) Dr. Joaquín Texeira Quirós (Spain) Dr. Maria Rosario Hernandes Justino (Portugal) Assistant Prof. Christian Rianero (Italy) Assistant Prof. Dr. İdil Göksel (Turkey) Asst. Prof. Dr.Kittipong Sophonthummapharn (Thailand) Assoc. Prof. Elf Akben Selcuk (Turkey) Dr. Emmanuel Senyo Fianu (Italy) Assistant Prof. Seyed Alireza Athari (Cyprus) Assistant Prof. Abderrazak Hassan Elkhladi (Tunisia) Assistant Prof. Ikechukwu Nwaka (Turkey) Muhammad Ishtiaq Ishaq, Ph.D. (Italy) Maria-Dolores Guillamon, Ph.D. (Spain) Prof. George Abuselidze (Georgia) Assoc. Prof. Mohammed Fellague (Algeria) Assoc. Prof. Haitham Nobanee (United Arab Emirates) Dr. Vasiliki Brinia (Greece) Teguh Sugiarto (Indonesia) Assistant Prof. Dr. Ahsan Riaz (Pakistan) Dr. Samar Rahi (Malaysia) Prof. Ravi Kumar Bommisetti (India)



Economics and Business Quarterly Reviews

Muhammad, H. S., Febrian, E., & Hadianto, B. (2022). The Macroeconomic-Based Systemic Risks and Bad Loans of Commercial Banks Listed in the Indonesian Capital Market. *Economics and Business Quarterly Reviews*, 5(2), 70-75.

ISSN 2775-9237

DOI: 10.31014/aior.1992.05.02.414

The online version of this article can be found at: https://www.asianinstituteofresearch.org/

Published by: The Asian Institute of Research

The *Journal of Economics and Business* is an Open Access publication. It may be read, copied, and distributed free of charge according to the conditions of the Creative Commons Attribution 4.0 International license.

The Asian Institute of Research *Journal of Economics and Business* is a peer-reviewed International Journal. The journal covers scholarly articles in the fields of Economics and Business, which includes, but is not limited to, Business Economics (Micro and Macro), Finance, Management, Marketing, Business Law, Entrepreneurship, Behavioral and Health Economics, Government Taxation and Regulations, Financial Markets, International Economics, Investment, and Economic Development. As the journal is Open Access, it ensures high visibility and the increase of citations for all research articles published. The *Journal of Economics and Business* aims to facilitate scholarly work on recent theoretical and practical aspects of Economics and Business.





The Macroeconomic-Based Systemic Risks and Bad Loans of Commercial Banks Listed in the Indonesian Capital Market

Helmi Setiawan Muhammad¹, Erie Febrian², Bram Hadianto³

¹ Graduate Student of the Master of Management Department, Faculty of Economics and Business at Padjadjaran University, Bandung, Indonesia

² Doctoral Management Science Department, Faculty of Economics and Business at Padjadjaran University, Bandung, Indonesia

³ Management Department, Faculty of Business at Maranatha Christian University, Bandung, Indonesia

Correspondence: Bram Hadianto, Management Department, Faculty of Business at Maranatha Christian University, Bandung, Email: tan han sin@hotmail.com

Abstract

The risk is the probability of uncertain situations with the changes. In banks, this circumstance happens when they distribute credits to the parties needing the cash. In performing this intermediary function, the systemic risks related to macroeconomics are available: inflation and exchange rate (ER) of IDR/USD. Hence, this research objective is to investigate and analyze the impact of these systemic risks on non-performing loans. The population originates from the commercial banks in the capital market in Indonesia from 2009 until 2017. We apply the Slovin formula and a simple random sampling method to calculate and acquire the total representative samples. After the archival technique collects the data, we use the regression with pooled data to analyze them. This study demonstrates that systemic risk from the inflation rate positively affects non-performing loans; however, the ER of IDR/USD shows no effect.

Keywords: Commercial Banks, Loan Risk, Systemic Macroeconomic Factors

1. Introduction

To perform the functional financial intermediary institution, the commercial banks are responsible for collecting the funds from society and distributing them back (Taswan, 2010). Furthermore, this collection and distribution of funds become the indicator of development for these banks (Kasmir, 2014). The fund distribution function of commercial banks contains credit risk coming from the incompetence of borrowers to pay the money on time to the banks. Hence, the banks have to consider their credit quality to minimize their default risk (Veithzal, Sudarto, Basir, & Rivai, 2013).

The previous study shows that uncollectible credit is becoming a bank issue. At a minimum, it is affected by two sources of macroeconomic factors, i.e., inflation and exchange rate. As a factor affecting NPL, inflation can depict a positive impact, as displayed by Farhan, Sattar, Chaudhry, and Khalil (2012), Ahmad and Bashir (2013), Benazic

Asian Institute of Research

and Radin (2015), or a negative effect, as demonstrated by Festic and Beko (2008) and Firmansyah (2014). Meanwhile, Warue (2013) and Wairimu and Gitundu (2017) do not prove the effect.

As the triggering factor of NPL, Festic and Beko (2008), Farhan et al. (2012), Benazic & Radin (2015), and Kamaludin et al. (2015) prove that the foreign exchange rate owns a positive influence. Conversely, Yam (2016) and Hernando, Miranda, Theodora, Kadarusman, and Ariyan (2020) confirm a negative effect. Meanwhile, Valahzaghard et al. (2012), Ahmad and Bashir (2013), as well as Wairimu and Gitundu (2017) cannot provide the influence.

By considering this heterogeneous evidence of the effect of inflation and exchange rate on bad loans, this research appears with the uniqueness, i.e., utilizing the systemic risk source as the non-performing loan determinant factor. According to DeBant et al. (2000) in Nabella, Maski, and Wahyudi (2020), the shock in the macroeconomy level becomes this risk source in a broad context. Because the risk is always connected with the terrible situation, we apply this framework when explaining the effect of systemic risk from macroeconomic factors, measured by the standard deviation of inflation and exchange rate, on bad loans. Also, to support this purpose, we utilize the listed banks in the Indonesian capital market between 2009 and 2017 as population and samples.

2. Literature Review and Hypothesis Development

2.1. The systematic risk from inflation and bad loans

Inflation demonstrates the commonly increasing price in society. It weakens public purchasing power to consume the products (Sukirno, 2016) and cuts company revenue (Sunariyah, 2011). This situation makes the companies unable to pay the banks for the debt principal and interest (Odusanya, Yinusa, & Ilo, 2018). Then, the banks will have a problem related to their distributed loans (Linda, Megawati, & Deflinawati, 2015). This illumination is confirmed by Farhan et al. (2012) and Ahmad and Bashir (2013) after investigating the banks in Pakistan by stating the higher inflation, the higher the loan risk. Likewise, Benazic and Radin (2015) support this positive tendency after studying and testing the Croatian banks and economy-related data. Therefore, the first hypothesis can be framed below.

H₁. The systemic risk from inflation affects bad loans positively.

2.1. The systematic risk from the exchange rate and bad loans

The supply and demand between the US dollars and the Indonesian rupiahs determine the exchange rate position. If the dollar request for global transactions is high, the IDR/USD position will be weak (Sukirno, 2016). Therefore, the Indonesian economy will be worse. In this situation, the companies cannot pay the debt to the banks; hence, the bank loans will be at risk (Kusmayadi, Firmansyah, & Badruzaman, 2017). This explanation gets supported by Festic and Beko (2008), Farhan et al. (2012), Benazic & Radin (2015), and Kamaludin et al. (2015), declaring a positive impact of the country-related exchange rate on the non-performing loan. Therefore, the second hypothesis can be framed below.

H₂. The systemic risk from the exchange rate of IDR/USD affects bad loans positively.

3. Research Method

The variables utilized are dependent and independent. The non-performing loan performs as the dependent variable. Meanwhile, the systemic macroeconomic risks of inflation and exchange rates become independent variables. Moreover, their definition and measurement are in Table 1.

Table 1: The variable definition and measurement

Variable	Definition	Indicator	Scale
The loan risk	The inability of debtors to pay for	The relative change in annual non-	Ratio
	their liabilities to the bank	performing loan	
The systemic risk	The increase in general price in the	The standard deviation of	Ratio
from inflation	economy of the country	quarterly inflation in a year	
The systemic risk of	The change in the currency exchange	The standard deviation of the	Ratio
exchange rate	rate	quarterly IDR/USD in a year	

The population of this study contains the commercial banks continually available in the Indonesian capital market between 2009 and 2017, and their total (TP) is 26. This information was obtained after tracing IDX Fact Books from 2008 to 2018. Furthermore, to determine the sample size (SS), we utilize the Slovin formula by employing a 5% border of fault (bf) (see equation one).

Based on this equation, the sample size $(SS) = \frac{26}{1+26(10\%)(10\%)} = \frac{26}{1.26} = 20.63 \approx 21$ banks. Then, these 21 banks are taken by the random sampling method from the population. Furthermore, their name is in this way.

- 1. AGRO: Bank Rakyat Indonesia Agroniaga Tbk.
- 2. BABP: Bank MNC Internasional Tbk.
- 3. BBCA: Bank Central Asia Tbk.
- 4. BBKP: Bank Bukopin Tbk.
- 5. BBNI: Bank Negara Indonesia (Persero) Tbk.
- 6. BBNP: Bank Nusantara Parahyangan Tbk.
- 7. BBRI: Bank Rakyat Indonesia (Persero) Tbk.
- 8. BCIC: Bank J-Trust Indonesia Tbk.
- 9. BDMN: Bank Danamon Indonesia Tbk.
- 10. BEKS: Bank Pembangunan Daerah Banten Tbk.
- 11. BMRI: Bank Mandiri (Persero) Tbk.
- 12. BBNA: Bank Bumi Arta Tbk.
- 13. BNGA: Bank CIMB Niaga Tbk.
- 14. BNII: Maybank Indonesia Tbk.
- 15. BVIC: Bank Victoria International Tbk.
- 16. INPC: Bank Artha Graha Internasional Tbk.
- 17. MAYA: Bank Mayapada Internasional Tbk.
- 18. MCOR: China Construction Bank Indonesia Tbk.
- 19. NISP: Bank OCBC NISP Tbk.
- 20. PNBN: Bank Pan Indonesia Tbk.
- 21. SDRA: Bank Woori Saudara Indonesia 1906 Tbk.

By indicating the variable scale in Table 1, we utilize the regression model with the pooling data and the t-statistics to investigate three hypotheses. Furthermore, this model is noticeable in equation two.

 $\Delta NPL_{it} = \beta_0 + \beta_1 SR_INF_t + \beta_2 SR_IDR/USD_t + \varepsilon_{it} \dots (2)$

In the regression model, the technique to estimate coefficients is based on an ordinary least square. Therefore, the classical assumptions: the normality of residuals, homoskedasticity, no multicollinearity, and no autocorrelation, must be proven to result in the best, most linear, and unbiased estimators. To confirm them, by denoting Ghozali (2016), we use the Kolmogorov-Smirnov Z-statistical test, White examination, variance inflation factor detection, and runs test, respectively.

4. Results and Discussion

4.1. Result

Table 2 exhibits the statistics, covering total observation (N), minimum, maximum, average, and standard deviation to describe the data. The data are associated with the measurement of the loan risk: the relative change in annual NPL; the systemic risk from inflation and exchange rate measured by the standard deviation of quarterly inflation and exchange rate of IDR/USD in a year, one to one.

Table 2: The statistics to describe the investigated variables					
Variable	Ν	Minimum	Maximum	Average	Standard
variable					Deviation
ΔNPL	189	0.2512	5.0286	1.121021	0.6019640
The systemic risk (SR) from INF	189	0.0877	0.5579	0.284211	0.1571639
The systemic risk (SR) from IDR/USD	189	4.64	6.83	5.6509	0.75553
G	TI 1 .		1.10		

Source: The data processed by IBM SPSS 19.

The regression will be an excellent empirical model if several tests related to classical assumptions are achieved (Ghozali, 2016), where the results are in Table 3:

- A. For the normality test, the asymptotic significance of the Z-statistic based on Kolmogorov-Smirnov is 0.000. This value goes under the 0.05 significance level (α). Consequently, the residual of the regression model does not follow the normal distribution. According to Bowerman and O'Connel (2003), denoting the central limit theorem, this situation can be allowed as long as this study involves the samples with numerous observations.
- B. For the homoskedasticity test, the probability of the Chi-Square statistic for observed R-squared is 0.2822. Because this value overdoes α of 0.05, the residual is not influenced by the squared SR_GDP, SR_INF, and SR_IDR/USD: Heteroskedasticity does not appear in this model.
- C. For multicollinearity detection, the variance inflation factor of SR_INF and SR_IDR/USD is the same, i.e., 1.507. This value is below ten as the cut-off point. Thus, multicollinearity is not present in this model.
- D. For the autocorrelation test, the asymptotic significance of the Z-statistic based on the average value of runs is 0.168. This value surpasses α of 0.05; hence, the residual of the regression model is random. This circumstance indicates no autocorrelation in this model.

fulle 5. The feath of the elastical assumption tests					
Classical assumption test	Statistical result	Meaning			
Normality: Kolmogorov-Smirnov test	Asymptotic significance of Z-	The residual of the regression model			
	statistic = 0.000^{a}	does not follow the normal distribution.			
Heteroskedasticity: White test	Probability of Chi-Square	Homoskedasticity exists in the			
$RESID^{2} = f(SR_INF^{2},$	statistic for Observed R-	regression model.			
SR_IDR/USD^2)	squared = 0.2570^{b}				
Multicollinearity detection	The variance inflation factor	The regression model is without a			
	of SR_INF and SR_IDR/USD	multicollinearity issue.			
	is 1.507 ^{a)}				
Autocorrelation: Runs test based on	Asymptotic significance of Z-	The autocorrelation does not occur in			
the average residual	statistic = 0.772^{a}	the regression model.			
~					

Table 3: The result of the classical assumption tests

Source: The output of IBM SPSS 19^{a} and E-Views 6^{b}

The fourth table displays the estimation result of the regression model with the probability of t-statistic for the explaining variables of non-performing loans:

a. The probability of the t-statistic for SR_INF is 0.0940 with a positive coefficient of 0.4572818. Because this probability is still below the relaxed significance level of 10%, the positive effect of SR_INF still exists.

b. The probability of the t-statistic for SR_IDR/USD is 0.424 with a negative coefficient of 0.045622. Because this probability is above the loosen significance level of 10%, this effect of SR_IDR/USD does not happen.

The affecting factors of the non-performing loans						
The explaining variable	Coefficient	Std. Error	t-Statistic	Probability		
С	0.298161	0.288112	1.034880	0.3021 ^{ns}		
SR_INF	0.472818	0.280859	1.683472	0.0940**		
SR_IDR/USD	-0.076112	0.058424	-1.302768	0.1943 ^{ns}		
Note:						
** = significant at 10% ns = not significant						

Table 4: The estimation result of the regression model:

Source: The data processed by E-Views 6

4.2. Discussion

This study points out some vital evidence related to inflation and IDR/USD exchange rate as the source of the macroeconomic systemic risk and their influence on the non-performing loans. Firstly, this study confirms that inflation positively affects uncollectible loans. By having a positive impact, this study affirms Farhan et al. (2012), Ahmad and Bashir (2013), and Benazic and Radin (2015). Inflation is the increase in prices of products because the aggregate demands are above its supplies. In this case, the government must control these prices by fiscal policy, such as adding subsidies for electricity and gasoline to enable the companies, especially for small and medium business scale, to create goods and services with affordable prices for society. If the goods and services are low-cost, these companies will be able to market them to obtain revenue and profits; hence, they can pay the debt, including principles and interest, to banks regularly.

Secondly, this study proves that the IDR/USD position does not affect the non-performing loans. It means that the banks can handle the IDR/USD fluctuation as one of the market risk parts by continuously measuring, monitoring, and controlling it without waiting for the lousy transmission from the business sector. Besides, the banks anticipate this risk by obeying the minimum capital adequacy rule set by the associated Indonesian central bank regulation. By having this evidence, this study supports Valahzaghard et al. (2012), Ahmad and Bashir (2013), as well as Wairimu and Gitundu (2017).

5. Conclusion

This investigation aims to prove and analyze the influence of systemic risk from inflation and the exchange rate of IDR/USD on the non-performing loan in commercial banks in the Indonesia stock exchange. After testing the hypotheses with the associated data between 2009 and 2017, this research shows that inflation positively induces uncollectible loans, but the exchange rate does not contribute to it.

This investigation is still weak, especially in the determinant numbers of bad loans and the bank scope. To overcome this first weakness, the subsequent scholars can combine two explaining variables in this study with macroeconomic determinants: economic growth, export, unemployment, interest rate, tax rate, foreign direct investment, and money supply. Then, to handle the second one, the following researchers are expected to unite the Indonesian listed and non-listed banks in their research model.

References

- Ahmad, F., & Bashir, T. (2013). The explanatory power of macroeconomic variables as determinants of nonperforming loans: Evidence from Pakistan. *World Applied Sciences Journal*, 22(2), 243-255.
- Benazic, M., & Radin, D. (2015). Macroeconomic determinants of the non-performing placements and off-balance sheet liabilities of Croatian Banks. *Organizacija*, 48(2), 75-87.

Bowerman, B. L., & O'Connell. (2003). Business Statistics in Practice. New York: McGraw-Hill.

- Farhan, M., Sattar, A., Chaudhry, A. H., & Khalil, F. (2012). Economic determinants of non-performing loans: Perception of Pakistani bankers. *European Journal of Business and Management*, 4(19), 87-99.
- Festic, M., & Beko, J. (2008). The banking sector and macroeconomic performance in central European economies. *Czech Journal of Economics and Finance*, 58(3-4), 131-151.

- Firmansyah, I. (2014). Determinant of non-performing loan: The case of Islamic Banks in Indonesia. *Bulletin of Monetary, Economics and Banking*, 17(2), 251-267.
- Ghozali, I. (2016). *Multivariate Analysis Application by IBM SPSS 23* (8 ed.). Semarang: Badan Penerbit Universitas Diponegoro.
- Hernando, A., Miranda, E., Theodora, L. L. A., Kadarusman, Y. B., & Ariyan, G. A. (2020). The effect of macroeconomics factors on non-performing loans exists in the Indonesian productive commercial credit. *Studi Akuntansi dan Keuangan Indonesia*, 3(1), 1-28.
- Kamaludin, K., Darmansyah, D., & Usman, B. (2015). The determinant of non-performing loan in the banking industry: Empirical evidence from the banks listed on the Indonesian capital market. *Jurnal Aplikasi Manajemen, 13*(4), 547-556.
- Kasmir, K. (2014). Bank and other financial institutions. Jakarta: PT RajaGrafindo Persada.
- Kusmayadi, D., Firmansyah, I., & Badruzaman, J. (2017). The impact of macroeconomic on non-performing loans: Comparison study at conventional and Islamic banking. *Iqtishadia: Jurnal Kajian Ekonomi dan Bisnis Islam*, *10*(2), 59-82.
- Linda, M. R., Megawati, M., & Deflinawati, D. (2015). The impact of inflation, exchange and interest rates on non-performing loan of PT Bank Tabungan Negara (Persero) Tbk in Padang. *Economica: Jurnal Program Studi Pendidikan Ekonomi STKIP PGRI Sumatera Barat*, 3(2), 137-144.
- Nabella, R. S., Maski, G., & Wahyudi, S. T. (2020). Systemic risk analysis using conditional value at tisk (CoVaR) model: Evidence in Indonesia. *Jurnal Ekonomi dan Studi Pembangunan*, 12(1), 57-67.
- Odusanya, I. A., Yinusa, O. G., & Ilo, B. M. (2018). Determinants of firm profitability in Nigeria: Evidence from dynamic panel models. *SPOUDAI Journal of Economics and Business*, 68(1), 43-58.
- Sukirno, S. (2016). Macroeconomics: The Introduction (3 ed.). Jakarta: Rajawali Press.

Sunariyah, S. (2011). Introduction to Capital Market Knowledge (6 ed.). Yogyakarta: UPP AMP YKPN.

- Taswan, T. (2010). Banking Management: Concepts and Their Application (2 ed.). Yogyakarta: STIE YKPN.
- Valahzaghard, M. K., Kashefi, M., Alikhani, A., & Hosseini, S. E. (2012). The effect of macroeconomic factors on credit risk in the banking system of Iran. *Management Science Letters*, 2, 1747–1754.
- Veithzal, A. P., Sudarto, S., Basir, S., & Rivai, V. (2013). Commercial Bank Management: Banking Management from Theory to Practice. Depok: RajaGrafindo Persada.
- Wairimu, M., & Gitundu, E. (2017). Macroeconomic determinants of non-performing loans in Kenya: 1998-2015. Research Journal of Finance and Accounting, 8(4), 98-105.
- Warue, B. N. (2013). The effects of bank-specific and macroeconomic factors on non-performing loans in commercial banks in Kenya: A Comparative panel data analysis. Advances in Management & Applied Economics, 3(2), 135-164.
- Yam, J. H. (2016). Impact of macroeconomics and bank specifics on non-performing loans and banking sustainability performance. *International Journal of Innovation and Applied Studies*, 18(4), 972-989.