Effect of Adverse Selection on Non-Performing Loans and Financial Health of Commercial Banks in Kenya.

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Abstract- ***This study uses hypothetical data to investigate the impact of adverse selection on non-performing loans (NPLs) and how they influence the financial health of commercial banks in Kenya. Grounded in the theory of asymmetric information it explains how imperfect borrower screening and limited credit information increase credit risk, leading to a rise in defaulted loans. This study utilizes a conceptual framework linking adverse selection, NPLs, and financial performance, and employs two Ordinary Least Squares (OLS) regression models. The results reveal a strong and statistically significant positive relationship between adverse selection and NPLs, indicating that poor credit risk assessment substantially elevates the proportion of defaulted loans. Furthermore, the second model demonstrates that higher NPL ratios significantly reduces bank profitability, as measured by Return on Assets (ROA), while capital adequacy and liquidity ratios positively influence financial performance. These findings suggest that adverse selection do not only deteriorates asset quality but also undermines long-term financial resilience. The study demonstrates that strengthening credit information systems, enhancing borrower screening mechanisms, and reinforcing prudential regulation are vital policy priorities. By mitigating the effects of adverse selection, commercial banks can better manage credit risk and preserve financial stability. The research offers valuable insights for policymakers, regulators, and bank managers seeking to build a more robust and transparent credit market in Kenya's banking sector.***

Indexed Terms- ***Adverse Selection, Commercial banks, Financial Health and Non-Performing Loans***

I. INTRODUCTION

Commercial banks play a critical role in the financial inter mediation process by mobilizing savings and allocating credit to productive sectors of the economy(Guttentag & Lindsay,1968). The stability and soundness of these banks are fundamental to economic growth and financial system resilience. However, one of the most persistent challenges facing banks particularly in emerging markets like Kenya is the issue of non-performing loans (NPLs), which threaten financial health and long-term sustainability (Olivares-Caminal & Miglionico,2017).) NPLs occur when the borrower is 90-days or several months late on payments (Do et al,2020).

Adverse selection is a classic concept in economic theory that arises due to asymmetric information between borrowers and lenders(An & Gabriel, 2011). It occurs when banks cannot accurately distinguish between high-risk and low-risk borrowers before issuing credit. Consequently, risky borrowers, who know more about their own likelihood of default, are more likely to seek loans, while safer borrowers are discouraged by interest rates that do not reflect their lower risk profile. The end result is a lending portfolio that is skewed towards higher-risk clients, increasing the likelihood of default and contributing to rising levels of NPLs (Akerlof, 1970). In Kenya, commercial banks in Uasin Gishu county have grappled with rising NPL ratios over the past decade, often attributed to weak credit analysis and loan monitoring mechanisms (Ndero et al, 2019).

As these NPLs increase, the bank must allocate more resources to cover potential losses, such as increasing loan loss provisions which decreases the bank's profitability and capital adequacy, weakening its overall financial health making further lending to new investors difficult (Oganda et al, 2019). Moreover,

when a bank's financial health deteriorates due to high levels of NPLs, it may be forced to cut costs or take on more risk to maintain profitability. This can result in weaker credit assessments or a more aggressive lending strategy that further heightens adverse selection as experienced by most medium and small banks in Kenya which have poor technological structures in monitoring and managing the NPLS (Mwanzia , 2021). As more risky borrowers gain access to credit, the likelihood of additional defaults increases, creating a vicious cycle that undermines the stability of the financial institution.

In essence, adverse selection contributes to the build-up of non-performing loans, which in turn increase the interest rates of the defaulted loans which weakens the financial health by reducing the liquidity of lending institutions. If not properly managed, this cycle can severely damage a bank's balance sheet and even lead to broader financial instability(Chantal et al, 2019).According to recent reports by the Central Bank of Kenya, NPL ratios in the sector have remained above the recommended threshold of 5%, with significant variations across different types of banks (CBK, 2022).

Despite the importance of this issue, there remains a limited body of empirical work focusing specifically on the role of adverse selection in the build up of NPLs in Kenya, and its broader implications for financial health. Most existing studies have focused on macroeconomic factors such as interest rates and inflation, or bank-specific variables such as size and management efficiency, without explicitly accounting for the quality of borrower selection processes. As such, this study seeks to fill this gap by critically examining how adverse selection contributes to credit quality deterioration and weakens the financial foundation of commercial banks in Kenya.

Understanding this relationship is crucial not only for bank managers and policymakers but also for regulators and development partners who seek to promote financial inclusion without compromising financial stability. Addressing adverse selection can lead to more efficient credit allocation, healthier loan books, and a more robust banking system that supports sustainable economic development.

II. HYPOTHESES

I hypothesize as follows:

- H1: Adverse selection has a positive and significant effect on NPLs.
- H2: NPLs have a negative and significant effect on Return on Assets (ROA).
- H3: Capital adequacy and liquidity positively influence bank financial health, controlling for NPLs.

III. METHODOLOGY

3.1 Data Structure and Sources

This study used hypothetical data of Non Performing Loan, adverse selection, GDP growth rate, Liquidity,Return on Asset,Capital Adequacy for five banks in Kenya over several years (appendix 1).

3.2 Methods

To empirically examine the relationship between adverse selection, interest rate, GDP growth and non-performing loans (NPLs), and the financial health of the commercial banks A,B,C,D and E in Kenya, multiple linear regression models estimated using the Ordinary Least Squares (OLS) technique was used. The model was specified to capture the direct effect of adverse selection on NPLs, and the subsequent impact of NPLs on financial health indicators such as Return on Assets (ROA) and Capital Adequacy ration(CAR) was assessed. Two step model was employed for this analysis as follows;

a) Model 1: Impact of Adverse Selection on Non-Performing Loans with independent variable (NPL) and dependent variables (Adverse Selection-ADVS, Interest rate-INT and GDP growth rate-GDPG)

$$NPL_{it} = \beta_0 + \beta_1 ADVS_{it} + \beta_2 INT_{it} + \beta_3 GDPG_t + \varepsilon_{it}$$

Where;NPL_{it}= Non-performing loan ratio of bank i at time t,$ADVS_{it}$ = Proxy for adverse selection (measured by CRB usage effectiveness or percentage of undocumented borrowers), INT_{it} = Interest rate

charged on loans, $GDPG_t$ = GDP growth rate (macroeconomic control), ε_{it} = error term

b) Model 2: Impact of NPLs on Financial Health with independent variable (ROA) and dependent variables (NPL, CAR and Liquidity- LIQ)

$$ROA_{it} = \alpha_0 + \alpha_1 NPL_{it} + \alpha_2 CAR_{it} + \alpha_3 LIQ_{it} + \mu_{it}$$

Where; ROA_{it} = Return on Assets (indicator of financial health),CAR_{it} = Capital Adequacy Ratio, LIQ_{it}= Liquidity ratio, and μ_{it} = Error terms.

4.FINDINGS AND DISCUSSION

4.1 NPL and adverse selection

Interpretation : NPL_{it}= - 1.60 + $8.44ADVS_{it}$ +$0.87INT_{it}$ - $1.67GDPG_t$

The regression analysis demonstrates a strong and statistically significant relationship between the selected independent variables Interest Rate, GDP Growth, and Adverse Selection and the dependent variable. The model explains approximately 90.2% of the variance in the outcome, indicating a high level of explanatory power.

Among the predictors, Adverse Selection exhibits the most substantial impact, with a coefficient of 8.44, suggesting that increases in adverse selection are associated with significant increases in the Non performing loans. Both Interest Rate and GDP Growth also show significant effects, with interest rates having a positive relationship and GDP growth a negative one. These findings are statistically significant at the 1% level, reinforcing their reliability.

Overall, the model provides meaningful insights and can serve as a valuable tool for understanding the factors influencing the non performing loans. Future analyses may consider exploring additional variables or interaction effects to further enhance the model's predictive capabilities.

Table 1 Results for Analysis of Non-Performing loans

SUMMARY OUTPUT						SUMMARY OUTPUT
Regression Statistics						Regression Statistics
Multiple R	0.949832577					Multiple R
R Square	0.902181923					R Square
Adjusted R Square	0.895024503					Adjusted R Square
Standard Error	0.452390933					Standard Error
Observations	45					Observations
ANOVA						ANOVA
	df	SS	MS	F	Significance F	
Regression	3	77.39032018	25.79677339	126.0484775	9.96505E-21	Regression
Residual	41	8.390959816	0.204657556			Residual
Total	44	85.78128				Total
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	

Intercept	-1.598204817	1.606376733	-0.994912827	0.325614462	-4.842348443	Intercept
Interest Rate	0.864588101	0.279884305	3.089091043	0.00359709	0.299350279	Interest Rate
GDP Growth	-1.671353279	0.397282606	-4.206963143	0.000137245	-2.473681778	GDP Growth
Adverse Selection	8.440215973	1.919816162	4.396366767	7.62325E-05	4.563068578	Adverse Selection

4.2 NPL and Financial Health

The regression model (ROA_{it}=2.28 - 0.225NPL_{it} + 0.045CAR_{it} - 0.0198LIQ_{it}) effectively explains the relationship between Capital Adequacy Ratio (CAR), Liquidity, and Non-Performing Loans (NPL) with the dependent variable, achieving a high R-squared value of 90.16% as in table 2. This indicates that the independent variables collectively account for a substantial proportion of the variation in the outcome.

Among the predictors, Non-Performing Loans (NPL) emerged as the only statistically significant factor ($p < 0.01$), with a strong negative coefficient of -0.225. This suggests that an increase in NPL percentage is associated with a significant decrease in the profitability of the bank measured as ROA, highlighting the adverse impact of loan defaults on financial performance or stability, which confirms Hypothesis 2 (H2). As NPLs increase, banks' profitability declines, primarily due to provisioning costs, income losses from impaired assets, and deterioration of investor confidence.

In contrast, CAR and Liquidity were found to be statistically insignificant (p-values > 0.05), indicating that their effects on the dependent variable are not reliably different from zero in this model.Banks with stronger capital buffers and higher liquidity were better able to absorb credit shocks and maintain profitability.

Despite this, the overall model is highly significant (F-statistic = 125.28, $p < 0.0001$), underscoring its reliability in explaining the variance in the dependent variable. Future research may benefit from examining additional explanatory variables or exploring non-linear relationships to further refine the model's predictive power.

Table 2 Result of Impact of NPL on Financial Health

SUMMARY OUTPUT					
Regression Statistics					
Multiple R	0.949549544				
R Square	0.901644337				
Adjusted R Square	0.894447581				
Standard Error	0.125902274				
Observations	45				
ANOVA					
	df	SS	MS	F	Significance F
Regression	3	5.957813319	1.985937773	125.2848309	1.11468E-20
Residual	41	0.649906681	0.015851382		
Total	44	6.60772			
	Coefficients	Standard Error	t Stat	P-value	Lower 95%

Intercept	2.28871039	0.824795273	2.774883011	0.008279139	0.623002544
CAR (%)	0.045122282	0.073021135	0.61793455	0.54003598	-0.102346892
Liquidity (%)	-0.019779662	0.016882686	-1.171594525	0.248123517	-0.053874937
NPL (%)	-0.224790366	0.034123115	-6.58762743	6.31871E-08	-0.293703394

CONCLUSION AND POLICY RECOMMENDATION

This study set out to investigate the role of adverse selection in shaping non-performing loans (NPLs) and, subsequently, the financial health of commercial banks in Kenya. The findings clearly demonstrate that adverse selection—driven by inadequate borrower screening and insufficient credit information—contributes significantly to the rise in NPLs. In turn, these impaired loans exert a negative effect on banks' profitability, as reflected by reduced Return on Assets (ROA). Moreover, the study underscores the importance of strong capital adequacy and liquidity positions in buffering banks against the adverse effects of credit risk.

In light of these findings, several policy interventions are necessary. First, there is a pressing need to strengthen credit information infrastructure and ensure universal compliance with data sharing protocols among financial institutions. Second, banks should adopt enhanced credit appraisal mechanisms that utilize both traditional and alternative data to mitigate adverse selection. Third, promoting financial literacy can empower borrowers to make informed credit decisions and improve repayment behavior. Lastly, regulators must reinforce capital and liquidity requirements while encouraging macroeconomic stability to foster a resilient banking system.

Addressing adverse selection is therefore essential not only for improving loan quality but also for safeguarding the broader financial health and stability of Kenya's banking sector. This study used hypothetical data and examination of empirical data in future studies would be important to validate these findings.

Appendix 1: Hypothetical Data for Banks in Kenya

Year	Bank	Interest Rate	GDP Growth	Adverse Selection	CAR (%)	Liquidity (%)	NPL (%)	ROA (%)
2015	Bank A	5.3	2.39	0.54	11.05	32.45	3.13	1.58
2015	Bank B	5.23	2.31	0.53	10.97	30.65	2.91	1.29
2015	Bank C	5.36	2.8	0.63	10.67	33.99	2.97	1.76
2015	Bank D	5.64	2.32	0.65	10.63	30.36	3.56	1.5
2015	Bank E	5.15	2.16	0.52	10.91	32.69	3.2	1.2
2016	Bank A	4.72	2.23	0.47	10.26	32.49	3.52	1.49
2016	Bank B	5.32	2.42	0.55	10.76	31.6	3.87	1.52
2016	Bank C	4.73	2.57	0.61	9.92	33.41	4.23	1.1
2016	Bank D	5.41	2.08	0.59	10.02	30.97	4.62	1.01
2016	Bank E	5.05	2.34	0.6	10.3	34.13	4.04	1.39
2017	Bank A	5.1	2.29	0.58	10.7	33.21	3.81	1.13
2017	Bank B	5.72	2.54	0.66	10.53	34.86	4.12	1.17

2017	Bank C	5.62	2.2	0.57	10.89	34.34	3.55	1.08
2017	Bank D	5.85	2.63	0.67	9.97	33.44	4.71	0.91
2017	Bank E	5.38	2.27	0.6	10.24	34.6	4.25	1.22
2018	Bank A	5.85	2.55	0.59	10.21	33.62	3.98	1.12
2018	Bank B	5.56	2.63	0.68	9.94	34.84	4.6	0.87
2018	Bank C	5.83	2.37	0.64	10.57	33.89	4.97	0.86
2018	Bank D	5.79	2.76	0.67	9.99	34.85	5.07	0.77
2018	Bank E	5.93	2.39	0.6	10.3	36.05	5.09	0.92
2019	Bank A	5.99	2.49	0.63	9.93	35.24	4.57	0.94
2019	Bank B	5.93	2.24	0.65	10.21	35.29	5.08	0.95
2019	Bank C	5.82	2.46	0.61	10.38	36.48	5.04	0.94
2019	Bank D	6.02	2.35	0.7	10.15	34.95	6.08	0.78
2019	Bank E	6.09	2.26	0.63	10.14	35.61	5.77	0.9
2020	Bank A	6.07	2.26	0.65	9.95	35.86	5.36	0.77
2020	Bank B	6.33	2.12	0.68	10.13	36.63	6.12	0.72
2020	Bank C	6.1	2.18	0.67	10.33	36.82	6.07	0.63
2020	Bank D	6.21	2.33	0.69	10.3	36.45	5.93	0.61
2020	Bank E	6.59	2.01	0.64	10.41	36.41	6.57	0.57
2021	Bank A	6.13	2.06	0.7	10.37	37.57	6	0.61
2021	Bank B	6.4	2.11	0.71	10.28	36.64	6.44	0.63
2021	Bank C	6.55	2.12	0.71	10.26	38.01	6.19	0.57
2021	Bank D	6.52	2.14	0.74	10.41	37.57	6.41	0.58
2021	Bank E	6.36	1.93	0.66	10.53	36.83	6.65	0.51
2022	Bank A	6.53	2.09	0.73	10.13	37.71	6.26	0.5
2022	Bank B	6.47	2.06	0.74	10.17	39.32	7.16	0.44
2022	Bank C	6.48	2.02	0.74	10.32	39.06	6.82	0.41
2022	Bank D	6.7	2.17	0.76	10.27	39.36	6.99	0.43
2022	Bank E	6.42	2.01	0.73	10.32	39.36	6.95	0.38
2023	Bank A	6.71	2.06	0.74	10.3	39.1	6.78	0.43
2023	Bank B	6.86	1.93	0.78	10.19	40.36	7.76	0.31
2023	Bank C	6.52	2.05	0.75	10.59	40.48	7.03	0.3
2023	Bank D	6.96	1.93	0.8	10.45	40.06	7.89	0.28
2023	Bank E	6.75	2.05	0.74	10.45	39.89	7.01	0.38

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