MACROECONOMIC DETERMINANTS OF BANK PROFITABILITY: EVIDENCE FROM GEORGIA

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Abstract
This paper examines macroeconomic impact on the profitability of Georgian banking sector during 2003-2017 years. The bank profitability variable is Return on Assets and as for macroeconomic variables they include gross domestic product, inflation, unemployment, foreign direct investment and exchange rate. Correlation analyses and regression analyses were done. Based on this, our results suggests that macro variables have week relationship with banks profitability variable.

Key words: *Macroeconomic, Bank, profitability, Correlation, Regression;*

JEL Code: *G01, G21, G30, C12, O50*

I. INTRODUCTION

Commercial banks profitability has become one of the core subject to study and all bank stakeholders, such as bank management, central bank regulatory authorities, researchers from all over the world pays a lot of attention to it. It should be noticed, that the latest research papers suggest the study of relationship between macroeconomic and bank profitability. From year to year research results of scientists differ. Some of the researchers suggest that macro variables play crucial role on bank profitability, but many researchers conclude that macro variables have no or weak relationship with profitability (literature review is in section 2). After having some literature survey, we suggest showing the results for Georgian case and in section 4 we have analyzed relationship between bank profitability and macro variables. Bank profitability and macro variables are studied and correlation analyze and regression analyze are given. To sum up our research results, we suggest conclusion in the end of the paper.

II. LITERATURE REVIEW

Ifuero Osad Osamwonyi and Chijuka Ify Michael (2014) studied the relationship between macro variables and bank profitability. They suggested that the higher risk associated with the macroeconomic variables, the lower the return on banks profitability is. Authors attempted to empirically examine the effects of macroeconomic variables on banks profitability in Nigeria. The results showed, that according to the t-values, all the other variables were statistically significant except inflation. Based on this, authors recommended banks to reduce their lending rate and explore strategies that will lead to lower operational cost of deposit attraction and also diversifying their sources of deposits. Results showed a positive relationship of gross domestic product (GDP) with return on equity (ROE). Interest rate and inflation rate have a negative relationship with return on equity (ROE). Gross domestic product have a significant positive effect on Return on equity(ROE) while interest rate have a significant negative effect on return on equity(ROE) but inflation is not significant at all levels of significance. Martinho and Oliviera (2017), support the idea and suggest in their research that positive relationship exists between GDP and bank profitability. Lery Alfani and Irvan Rustandar (2013) concluded that the independent variables simultaneously exchange rate of U.S. $ and inflation rates significantly influence the national private banking profitability on the ROA form. According to their They recommendation bank management should take notice of macro variables.

Yong Aaron Tan and Christos Floros (2012), here is a negative relationship between GDP growth and bank profitability. Moreover, the results of Tan and Floros showed that bank profitability in the Chinese banking industry is significantly affected by the level of non-performing loans, and (2) Chinese banks with higher levels of capital have lower profitability. The empirical findings of Sara Kanwal and Muhammad Nadeem (2013) indicate a strong positive relationship of real interest rate with ROA, ROE and EM. According to their research results, real GDP is found to have an insignificant positive effect on ROA, but an insignificant negative impact on ROE and EM. After using POLS regression, authors concluded, that macroeconomic factors do not contribute noticeably to the profits of banks, so in order to maximize the risk-adjusted returns banks have to focus more on other external factors or devise policies to improve the internal factors. Ovamba Evans and Evans Kiganda (2014) research results indicated that macroeconomic factors such as real GDP, inflation and exchange rate have insignificant effect on bank profitability in Kenya. Based on which they concluded that macroeconomic factors

do not affect bank profitability in Kenya. According to their research, banks external factors do not determine bank profitability, they support internal factors, in their opinion internal factors related to bank management significantly determine bank profitability in Kenya.

Syaza Laila Dinson (2017), used regression and bivariate correlation analyses and as a result, GDP and leverage performance has no significant and low impact to the CIMB Bank Profitability. Aini Rafiqah Rosli (2017) research results demonstrated that the inflation do not have significant effect on bank profitability but authors still considers inflation to have a relationship with ROA since it is affected in a certain part in financial statement.

III. METHODS

Bank profitability and macroeconomic variables are studied in our research. According to common opinion macroeconomic variables and bank profitability have some relationship. Our research attempts to find out the existence of the relationship on the example of Georgian banking industry. The data are collected from the National Bank of Georgia and The National Statistics Office of Georgia over the 2003-2017 years period. We suggest the following hypothesis:

H0: Macroeconomic variables are not significantly associated with bank profitability.
H1: Profitability has strong relationship with GDP
H2: H2: Profitability has strong relationship with Inflation
H3: Profitability has strong relationship with Unemployment
H4: Profitability has strong relationship with FDI
H5: Profitability has strong relationship with exchange rate

In order to reject or accept the above mentioned hypothesis, we use correlation matrix and tested the hypothesis with regression analyses. Macro variables are Gross Domestic Product, Inflation rate, Unemployment rate, Foreign Direct Investments and Exchange rate. They are used as independent variables. As for bank profitability, variable is Return on Assets.

IV. RESEARCH RESULTS

Profitability has weak relationship with macro variables. As we see from correlation matrix (table 1), ROA has weak relationship with GDP, Unemployment and Inflation. ROA has weak negative relationship with gross domestic product, correlation coefficient is -0.005. Inflation has negative relationship with profitability, correlation coefficient is -0.43 for ROA. Unemployment has also negative relationship with profitability, correlation coefficient is -0.22 for ROA. Profitability has positive relationship with foreign direct investment. It should be noted, that relationship is extremely insignificant. Coefficient is 0.1 for ROA, this means that FDI growth causes profitability growth slightly. As for Exchange rate correlation is weak negative, -0.01 for ROA.

Table 1.

	1	2	3	4	5	6
1. ROA % change	1					
2. Gross Domestic Product % change	-0.00574	1				
3. Inflation % change	-0.43594	0.575442	1			
4. Unemployment Rate % change	-0.2256	-0.18901	-0.01727	1		
5. FDI % change	0.102991	0.638764	0.419455	-0.13537	1	
6. Exchange Rate ($) % change	-0.01943	-0.47998	-0.1413	-0.31888	-0.27762	1

In order to test our hypotheses, we make regression analyses, where bank profitability is independent variable and macro variables are dependent. We took only ROA as an independent variable in all cases of the research.

We have made regression for Return on Assets ratio percent change and Gross Domestic Product percent change, where ROA is dependent variable and GDP is independent variable. As the multiple R is 0.0057, there is a linear relationship. From table 2, we can see, that Coefficient of Determination R square is 0%. T statistics for intercept is -0.60689 and is less than p-value, which is 0.554377. We do not reject the null hypothesis at level .05 since the p-value is greater than 0.05. Also, significance F is 0.983791032131857. Coefficient is -0.0844284670451566 for GDP. y = -0.0844x-0.3426.

Table 2.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.00574399
R Square	3.2993E-05
Adjusted R Square	-0.0768875
Standard Error	1.16248048
Observations	15

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.00058	0.00058	0.00043	0.983791
Residual	13	17.56769	1.351361		
Total	14	17.56827			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.3426173	0.564548	-0.60689	0.55438	-1.56225	0.8770149	-1.5622495	0.8770149
Gross Domestic Product % change	-0.0844285	4.076585	-0.02071	0.98379	-8.89136	8.7224986	-8.8913555	8.7224986

We have made regression for Return on Assets ratio percent change and exchange rate, where ROA is dependent variable and exchange rate is independent variable. As the multiple R is 0.01943, there is a linear relationship. From table 3, we can see, that Coefficient of Determination R square is 0%. T statistics for intercept is -1.15 and is less than p-value, which is 0.26. We do not reject the null hypothesis at level .05 since the p-value is greater than 0.05. Also, significance F is 0.945204. Coefficient is -0.21681 for exchange rate. y = -0.21681x-0.34964.

Table 3.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.0194305
R Square	0.0003775
Adjusted R Square	-0.0765165
Standard Error	1.1622802
Observations	15

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.0066328	0.0066328	0.0049099	0.9452037
Residual	13	17.561638	1.3508952		
Total	14	17.568271			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.3496354	0.30291	-1.1542551	0.269174	-1.0040325	0.3047618	-1.0040325	0.3047618
Exchange Rate ($) % change	-0.2168079	3.0941226	-0.0700709	0.9452037	-6.9012535	6.4676376	-6.9012535	6.4676376

As the multiple R is 0.2295, there is a linear relationship. From table 4, we can see, that Coefficient of Determination R square is 5%. T statistics for intercept is 1.09 and is less than p-value, which is 0.29. We do not reject the null hypothesis at level .05 since the p-value is greater than 0.05. Also, significance F is 0.410528. Coefficient is -2.5356 for unemployment rate. y = -2.5356x-0.3227.

Table 4.

SUMMARY OUTPUT					
Regression Statistics					
Multiple R	0.229543				
R Square	0.05269				
Adjusted R Square	-0.02018				
Standard Error	1.1314592				
Observations	15				
ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.9256717	0.9256717	0.7230681	0.4105277
Residual	13	16.642599	1.2801999		
Total	14	17.568271			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.3226977	0.2942391	-1.0967192	0.2926646	-0.9583627	0.3129673	-0.9583627	0.3129673
Unemployment Rate % change	-2.5356488	2.9819441	-0.8503341	0.4105277	-8.9777474	3.9064498	-8.9777474	3.9064498

As the multiple R is 0.435938, there is a linear relationship. From table 5, we can see, that Coefficient of Determination R square is 19%. T statistics for intercept is 0.73 and is greater than p-value, which is 0.47. We do not reject the null hypothesis at level .05 since the p-value is greater than 0.05. Also, significance F is 0.104295009834479. Coefficient is -0.135303878742443 for inflation rate. y = -0.1353x-0.3561

Table 5.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.4359382
R Square	0.1900421
Adjusted R Square	0.1277376
Standard Error	1.0462225
Observations	15

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	3.3387109	3.3387109	3.0502167	0.104295
Residual	13	14.22956	1.0945815		
Total	14	17.568271			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.3561314	0.4874544	0.7305942	0.4779882	-0.6969499	1.4092126	-0.6969499	1.4092126
Inflation % change	-0.1353039	0.077472	-1.746487	0.104295	-0.302672	0.0320643	-0.302672	0.0320643

As the multiple R is 0.102991, there is a linear relationship. From table 6, we can see, that Coefficient of Determination R square is 1.06%. T statistics for intercept is -1.21 and is less than p-value, which is 0.24. We do not reject the null hypothesis at level .05 since the p-value is greater than 0.05. Also, significance F is 0.714924. Coefficient is 0.21 for FDI. y = 0.211149x-0.41187

Table 6.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.1029911
R Square	0.0106072
Adjusted R Square	-0.0655
Standard Error	1.1563178
Observations	15

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.1863494	0.1863494	0.1393714	0.7149237
Residual	13	17.381921	1.3370709		
Total	14	17.568271			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.4118668	0.3382439	-1.217662	0.2449934	-1.1425984	0.3188648	-1.1425984	0.3188648

FDI % change	0.2111488	0.56559	0.3733248	0.7149237	-1.0107342	1.4330317	-1.0107342	1.4330317

V. CONCLUSION

In summary, our research goal was to study the relationship between bank profitability and macroeconomic variables. Based on literature review, we find out that, macro variables have positive relationship with return on assets, but some researchers contradict this opinion. Based on our research results, we conclude that relationship between bank profitability and macro variables does not exist. Our research suggested the null hypothesis, that macroeconomic variables are not significantly associated with bank profitability.

As the research has demonstrated we reject all Hypothesis except null hypothesis, according to which macroeconomic variables are not significantly associated with bank profitability.

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