International Journal of Scientific Research in Science and Technology
Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)
doi : https://doi.org/10.32628/IJSRST52310276

Analyzing Relationship Between ROA and Beta and The Influence of Multi Factors on ROA – A Case of Vietinbank in Vietnam

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ARTICLEINFO

Article History:

Accepted: 01 April 2023
Published: 12 April 2023

Publication Issue
Volume 10, Issue 2
March-April-2023

Page Number
552-561

ABSTRACT

In emerging markets such as Vietnam, banking markets has been developing with fast growth and implies risk, hence, we need to focus on building strategies for improving ROA and profitability of banks.

Hossain and Khalid (2018) found that bank specific factors and market specific factors have influenced the bank profitability. One of this study's purposes is to state formulation of weighted beta capm index,

By using VAR (vector auto-regression model) which is a reliable method, our research results tell that there are management and policy implications: Ministry of Finance, State bank of Vietnam and relevant agencies need to control GDP better in medium term to help increasing bank ROA.Beside, the bank may increase lending rate in long term to support ROA. Also, the bank consider to mange cost better in medium term to increase ROA. Last but not least, bank management can consider to reduce lending rate in short term in order to reduce risk or beta.

Therefore, our study can be expanded for other markets.

Keywords : VAR model, Vietinbank, ROA, multifactors

JEL: M21, G30, G32, G38

I. INTRODUCTION

First, we recognize the importance of profitability analysis in banking also increase to a new level in recent years.

Then, Gazi et al (2021) presented result of study reveals that both firms' specific variables (i.e. Equity to Asset Ratio, Deposit to Asset ratio, Debt to Equity Ratio, Loan to Deposit Ratio) and macroeconomic variable (GDP growth rate) have statistically significant impact on the profitability, represented by Return on Asset (ROA) and Return on Equity (ROE). All the research findings are very useful to the investors, shareholders, bank's authority, policy makers, and government for the improvement of the performance in the banking sector of Bangladesh.

Moreover, Aydemir and Ovenc (2016) pointed that interest rate has a significant impact on the banks' profitability.

Next, We emphasize that the role of reliable internet data increasing in recent years. There is evidence in banking sector showing that internet data serving better for building information system for better bank management.

Therefore In this paper authors will choose the topic "Analyzing Relation Between ROA and Beta AND THE INFLUENCE OF MULTI FACTORS ON ROA of Vietinbank in Vietnam".

Research questions:

Question 1: What are VAR model results for ROA-Vietinbank case?

Question 2: What are policy and management implications for the bank?

II. LITERATURE REVIEW

First, Noman et al (2015) showed that actual interest rates have a negative effect on the profitability whereas inflation rate, size and capital adequacy affect positively in case Bangladesh banks.

Scond, Trivelas and Satouridis (2013) stated that in Greece a) the externally focused Management Information System (MIS) effectiveness archetypes (OS, RM) reflecting innovation, creativity, goal setting and planning enhance task productivity b) the Internal process (IP) model of MIS effectiveness influences negatively task productivity.

Third, HT Hanh et al (2021) pointed we could improve Accounting Management VIA Measuring Effects of Cost and Revenue Factors on Accounting Net Profit.

Fourth, PTH Nhung et al. (2021) mention relation between Internal Control Procedures, Cost Estimation and Internal Audit.

Then, We summarize previous studies as follows:

Table 1 – Summary of previous studies

Authors	Year	Contents, results
Karim, A.J	2011	Management Information Systems (MIS) is the key factor to facilitate and attain efficient decision making in an organization.
Avegrou, C.	2008	Information system (IS) in emerging markets research has expanded the IS research agenda and developed new understanding of IS innovation phenomena, mainly through its attention to social context and strategic concerns associated with socio-economic development. As it encounters questions on policy and practice of development, it is confronted with critical issues associated with the role of Information and Communication Technology (ICT) in the transformation of social relations and macro-level institutions.
Patrick	2017	also interested in identifying the impact of capital structure on

		profitability, particularly in oil marketing companies in Ghana. The study employed multiple regressions with short-term debt and long-term debt as independent variables representing capital structure and ROA, ROE and net profit margin (NPM) as dependent variables
Giebe et al	2019	a progressive tool for providing customer-oriented services and products, in the banking sector, is currently defined as "Big Data & Analytics".
Van Hau et al	2021	The results via Ordinary Least Squares (OLS) regression method show the impacts of internal factors with the following observed variables: the ratio of short-term debt to total liabilities (CS1) and total assets (S2) have an opposite impact (–) on ROA and ROE; debt-to-total assets ratio (CS2) has an opposite effect (–) on ROA; growth of total assets (G2) of the growth factor positively affects (+) ROA and ROE, the remaining factors do not affect ROA and ROE; and internal factors do not influence ROS. Based on the findings, some recommendations have been proposed to help the F&B firms listed on the Hanoi Stock Exchange improving their firm performance in the future
Men & Hieu	2021	show that there are four factors that have an impact on ROA, namely, leverage, government ownership, dividend, and exchange rate. Whereas leverage and exchange rate have negative influence on ROA, government ownership and dividend payment have a positive effect. The findings of this study suggest that high debt ratio in capital structure and the negative effect of exchange rate on their companies' efficiency can adversely affect the profit of enterprises. Also, plausible extent of

		government ownership and dividend payment could also be considered to optimize corporate performance.

III. METHODS AND MATERIAL

Method and Data

This study mainly use combination of quantitative methods and qualitative methods including synthesis, inductive and explanatory methods. And it emphasizes again important roles of internet data in setting strategies and building models for improving ROA of banks.

For quantitative analysis, the study is supported with vector auto-regression model (VAR).

Data is collected from reliable internet sources and websites such as SBV, banks, GSO, Bureau of statistics, etc.

IV. RESULTS AND DISCUSSION

Main results

4.1 OLS Regression results

Authors conduct VAR model in below procedures:

First because the condition of VAR model require all variables have unit root, we perform:

Step 1: Results of Unit root test:

D(Beta_CTG) has a unit root (Fig 1)

D(G) also has a unit root (Fig 2)

Figure 1 - Unit root test Variable D(Beta_CTG)

Augmented Dickey-Fuller Unit Root Test on D(BETA_CTG)

Null Hypothesis: D(BETA_CTG) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on SIC, MAXLAG=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.900442	0.0054
Test critical values:	1% level	-4.571559	
	5% level	-3.690814	
	10% level	-3.286909	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 18

(source: authors analysis with Eview)

Figure 2 - Unit root test Variable D(G)

Augmented Dickey-Fuller Unit Root Test on D(G)

Null Hypothesis: D(G) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on SIC, MAXLAG=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.960108	0.0001
Test critical values:	1% level	-4.571559	
	5% level	-3.690814	
	10% level	-3.286909	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 18

(source: authors analysis with Eview)

Then performing same functions we get results below:
Unit root test for ROA : Accept with D(ROA,2)
Unit root test for Operating cost: Accept with D(Operating_cost)
Unit root test for R (lending rate): Accept with D(Lendingrate)
(with P-value <0.05)
So, We derive VAR model equation as follows:
D(ROA,2) D(Operating_cost) D(Lendingrate) D(G) D(Beta_CTG)

Step 2: Estimate VAR with Eview

Choose lag length = 2 with minimum AIC

Figure 3 - VAR Lag length

VAR Lag Order Selection Criteria
Endogenous variables: D(ROA,2) D(OPERATING_COST) D(R) D(G) D(BETA_CTG)
Exogenous variables: C
Date: 02/22/12 Time: 21:46
Sample: 1 20
Included observations: 16

Lag	LogL	LR	FPE	AIC	SC	HQ
0	20.15626	NA	1.04e-07	-1.894533	-1.653099	-1.882170
1	53.11600	41.19967*	4.64e-08	-2.889500	-1.440896	-2.815320
2	106.5168	33.37549	5.21e-09*	-6.439598*	-3.783824*	-6.303600*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

(source: authors analysis with Eview)

Figure 4 - Estimate VAR results

Vector Autoregression Estimates

Vector Autoregression Estimates
Date: 02/22/12 Time: 21:45
Sample (adjusted): 5 20
Included observations: 16 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	D(ROA,2)	D(OPERAT...	D(R)	D(G)	D(BETA_C...
D(ROA(-1),2)	-1.309824	8954.308	-0.938794	1.829866	129.9241
	(0.35952)	(243714.)	(4.30031)	(4.03050)	(244.283)
	[-3.64322]	[0.03674]	[-0.21831]	[0.45400]	[0.53186]
D(ROA(-2),2)	-0.404787	-100998.3	-2.315159	-6.420904	-1.279846
	(0.32827)	(222531.)	(3.92653)	(3.68017)	(223.051)
	[-1.23307]	[-0.45386]	[-0.58962]	[-1.74473]	[-0.00574]
D(OPERATING_COST...	5.28E-07	0.430006	7.63E-06	5.22E-06	0.000609
	(6.7E-07)	(0.45706)	(8.1E-06)	(7.6E-06)	(0.00046)
	[0.78374]	[0.94081]	[0.94664]	[0.69073]	[1.32883]
D(OPERATING_COST...	-1.91E-06	-0.159334	2.12E-06	1.67E-06	0.000758
	(7.0E-07)	(0.47207)	(8.3E-06)	(7.8E-06)	(0.00047)
	[-2.73815]	[-0.33752]	[0.25419]	[0.21451]	[1.60130]
D(R(-1))	0.016105	-19835.69	-0.851888	0.389496	-23.91777
	(0.02961)	(20075.0)	(0.35422)	(0.33200)	(20.1219)
	[0.54382]	[-0.98808]	[-2.40496]	[1.17319]	[-1.18864]
D(R(-2))	0.069970	20191.56	0.303711	-0.004888	-9.435818
	(0.02755)	(18673.0)	(0.32948)	(0.30881)	(18.7165)
	[2.54010]	[1.08133]	[0.92178]	[-0.01583]	[-0.50414]

(source: authors analysis with Eview)

Step 3: Check resid unit root test, we see P-value < 0.05 then results acceptable

Figure 5 - Resid Unit root test

ADF Fisher Unit Root Test on UNTITLED

Null Hypothesis: Unit root (individual unit root process)
Date: 02/22/12 Time: 21:48
Sample: 1 20
Series: RESID01, RESID02, RESID03, RESID04, RESID05
Exogenous variables: Individual effects, individual linear trends
User specified maximum lags
Automatic selection of lags based on SIC: 1 to 2
Total number of observations: 68
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	32.1892	0.0004
ADF - Choi Z-stat	-3.65262	0.0001

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

(source: authors analysis with Eview)

Step 4: Test variance decomposition Choelesky

Figure 6 - Variance decomposition D(ROA,2)

Variance Decomposition of D(ROA,2):

Period	S.E.	D(ROA,2)	D(OPERA...	D(R)	D(G)	D(BETA_...
1	0.001079	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.001738	92.06648	6.487812	0.477814	0.954656	0.013241
3	0.002895	52.57090	41.62715	5.129688	0.357294	0.314963
4	0.003660	47.67394	46.81193	4.561064	0.749573	0.203496
5	0.004479	42.33133	50.01902	3.201465	4.145319	0.302861
6	0.005514	41.17528	50.82896	4.081383	3.696898	0.217485
7	0.007287	44.59207	46.21162	5.368250	3.663923	0.164141
8	0.009589	48.30994	41.65096	6.886999	2.933468	0.218635
9	0.012917	47.19686	41.92902	7.562416	3.111977	0.199730
10	0.016782	47.10242	41.83475	8.068073	2.840036	0.154720

Variance Decomposition of D(OPERATING_COST):

Period	S.E.	D(ROA,2)	D(OPERA...	D(R)	D(G)	D(BETA_...
1	731.2124	17.22654	82.77346	0.000000	0.000000	0.000000
2	906.8776	11.43450	75.24847	12.59196	0.342991	0.382073
3	1065.414	9.472412	55.17623	23.69694	10.29604	1.358377
4	1108.356	8.988926	51.61748	22.19109	15.78281	1.419695
5	1200.895	17.25857	45.25557	19.43940	16.63278	1.413662
6	1230.457	18.39080	43.52356	18.71771	17.94473	1.423196
7	1435.190	14.80008	50.90101	13.96979	19.17143	1.157688
8	1462.386	14.73622	49.23164	13.66634	21.09432	1.271473
9	1760.170	14.42398	50.15962	9.681757	24.69913	1.035509

(source: authors analysis with Eview)

Next result:

Figure 7 - Variance decomposition D(R), D(G)

Variance Decomposition of D(R):

Period	S.E.	D(ROA,2)	D(OPERA...	D(R)	D(G)	D(BETA_...
1	0.012902	17.09576	3.923038	78.98120	0.000000	0.000000
2	0.016206	10.87899	7.506792	73.98822	7.485688	0.140310
3	0.021613	8.288030	19.95614	67.03940	4.269167	0.447268
4	0.024471	6.771298	15.66345	68.90735	7.566466	1.091438
5	0.026497	5.778266	17.55680	65.71374	9.932362	1.018831
6	0.028783	6.183200	18.97457	61.63423	12.30582	0.902180
7	0.030077	5.675040	18.68609	59.03338	15.77918	0.826313
8	0.034285	4.562562	24.02746	50.26358	20.22788	0.918511
9	0.036129	4.323554	24.34980	47.47484	22.88065	0.971155
10	0.041755	4.288763	29.32229	37.96862	27.47939	0.940950

Variance Decomposition of D(G):

Period	S.E.	D(ROA,2)	D(OPERA...	D(R)	D(G)	D(BETA_...
1	0.012093	11.28183	19.84480	1.791336	67.08203	0.000000
2	0.016154	22.64277	12.48258	17.73036	46.18116	0.963135
3	0.028295	37.99979	23.73405	9.665553	28.02413	0.576482
4	0.034694	45.87104	17.08903	14.20149	21.94365	0.894796
5	0.053900	35.64166	38.12389	8.917172	16.91693	0.400347
6	0.061396	40.26534	33.65239	11.42898	14.29541	0.357879
7	0.088355	34.05689	43.58808	7.490100	14.69133	0.173598
8	0.102592	39.91358	37.63801	10.57247	11.66044	0.215502
9	0.147264	36.89303	43.33357	7.818526	11.82921	0.125660
10	0.174293	42.81615	37.71543	10.53388	8.729946	0.204596

(source: authors analysis with Eview)

Final Results for:

Figure 8 - Variance decomposition D(Beta_CTG)

Variance Decomposition of D(BETA_CTG):

Period	S.E.	D(ROA,2)	D(OPERA...	D(R)	D(G)	D(BETA_...
1	0.732920	24.23009	28.27862	31.84372	4.967992	10.67957
2	0.893364	41.95549	22.72623	21.62366	4.745348	8.949277
3	1.023954	32.16134	26.85994	19.49752	13.85850	7.622696
4	1.087530	29.12628	33.48770	17.35954	12.30827	7.718199
5	1.293955	37.23293	32.36788	12.26622	12.55520	5.577775
6	1.608678	47.76254	28.38435	11.64157	8.183990	4.027555
7	2.272477	45.47205	36.34334	9.989333	5.816068	2.379215
8	2.725219	47.63765	37.00113	9.368850	4.296144	1.696227
9	3.560141	41.78945	43.80368	6.970594	6.421907	1.014368
10	4.358639	44.34850	42.52905	7.921831	4.520403	0.680211

Cholesky Ordering: D(ROA,2) D(OPERATING_COST) D(R) D(G) D(BETA_CTG)

(source: authors analysis with Eview)

Discussion

First, Figure 6 tell us that: in period 1, all variables have no impact. Then, D(Operating_cost) has high impact values on D(ROA,2) in periods 4-5-6 (46.8, 50, 50.8 values accordingly). Also, D(G) has high impact in period 5 and D(R) has high impact in period 10.

Second, From Figure 7 we see: D(ROA,2) has high impact on D(G) in periods 4-6, and high impact values on D(R) in period 2-3.

Third, From figure 8 we see that: D(ROA,2) has higher impact value on D(Beta) in period 2 (41.9) and then decline then increase in periods 6-10. We also recognize that D(Operating_cost) has high impact value on D(Beta) in period 9-10 (43.8 and 42.5 values). Whereas D(R) has high impact value on D(Beta) in period 2-3.

And NN Thach et al (202) stated relation between market risk (beta) and risk management of banks.

V. CONCLUSION

Because results of variance decomposition above show us that:

D(Operating_cost) has high impact values on D(ROA,2) in periods 4-5-6 (46.8, 50, 50.8 values

accordingly). Also, D(G) has high impact in period 5 and D(R) has high impact in period 10.

We would recommend that:

Ministry of Finance, State bank of Vietnam and relevant agencies need to control GDP better in medium term to help increasing bank ROA.

Management implications:

Beside, the bank may increase lending rate in long term to support ROA.

Also, the bank consider to mange cost better in medium term to increase ROA (see fig 6).

Last but not least, bank management can consider to reduce lending rate in short term in order to reduce risk or beta (figure 8).

Limitation of research

We can expand our research model for other industries and other markets.

Acknowledgement

Thank you editors, friends to assist this publication.

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Cite this article as :

Nguyen Huu Luan, Dinh Tran Ngoc Huy, Le Ngoc Nuong , "Analyzing Relationship Between ROA and Beta and The Influence of Multi Factors on ROA – A Case of Vietinbank in Vietnam ", International Journal of Scientific Research in Science and Technology (IJSRST), Online ISSN : 2395-602X, Print ISSN : 2395-6011, Volume 10 Issue 2, pp. 552-561, March-April 2023. Available at doi : https://doi.org/10.32628/IJSRST52310276
Journal URL : https://ijsrst.com/IJSRST52310276