

Causality tests for vector error correction modeling economics essay

[Economics](#)



4. 1 Introduction

Having specified the model for this study in the preceding chapter, this chapter focuses on the presentation, estimation and analysis of data and the interpretation of results. The Johansen's co-integration test was used to estimate the long run relationship between the dividend per share, market capitalization and share prices.

4. 2 Descriptive Analysis

Table 4. 2. 1

DSVDPSMPSMean0. 76375016. 88146Median0. 79000016. 27500Maximum1. 20000045. 75000Minimum0. 0200006. 380000Standard Deviation0.

3393309. 888385Jarque-Bera0. 96624610. 65727Probability0. 6168540.

004851Source: Computed using Eviews 5. 1The first two descriptive statistics (the mean and median) are measures of central tendency for all the variables above. Standard deviation is used to express deviation from the mean. Market price per share has the higher standard deviation while Dividend per share (DPS) has the lower standard deviation. The Jacque-Bera test is a test for normality of the distribution. The null hypothesis of the Jacque-Bera test is that the distribution of the data is a normal one.

Therefore, if the probability value of the Jacque-Bera test is significant, then the null hypothesis is rejected and an alternative hypothesis is accepted.

This alternative hypothesis says that the sample is not normally distributed.

For a variable to be statistically significant, it must reflect a zero probability.

By virtue of this, if each of the variables above is statistically significant, then the series is not normally distributed. Hence, the farther the probability

statistic of a variable is to zero, the lower the value of its Jacque-Bera statistic and the more normally distributed it is (and vice versa). From the results given in the table 4. 2. 1, the Jacque-Bera test shows that the null hypothesis is strongly accepted for all the distribution. Hence, the variables can be described to be normally distributed in the following order (from the higher to the lower); Market price per share, Dividend per share.

4. 3 Unit root test

The characteristics of the data gathered on the variables in the model have to be examined before estimation. Testing the stationary nature of economic time series data is important since standard econometric methodologies assume stationarity in the time series while they are in the real sense non-stationary. Hence the usual statistical tests are likely to be inappropriate and the deductions made are likely to be erroneous and misleading. For example, the ordinary least squares (OLS) estimation of regressions in the presence of non-stationary variables gives rise to spurious regressions if the variables are not co integrated (Dauda 2009). Test for stationary nature of the variables was carried out using Augmented Dickey-Fuller (ADF) test. The results of the unit root tests are presented in tables 4. 3. 1 and 4. 3. 2. The result in Table 4. 3. 1 shows that all the variables are not stationary at levels. Table 4. 3. 2 shows that the variables are stationary at first difference.

Test for Stationary at levels

Table 4. 3. 1

ADF (Augmented Dickey Fuller test)

SERIES

Intercept with no trend

Order of Integration

DPS0. 412691I(0)MPS-2. 190322I(0)

Critical Values at 5% level of significance

Level

-3. 175352

Test for Stationary at 1st difference

Table 4. 3. 2

ADF (Augmented Dickey Fuller test)

SERIES

Intercept with no trend

Order of Integration

DPS-4. 488270I(1)MPS-4. 227162I(1)

Critical Values at 5% level of significance

Level

-3. 098896

4. 4 Dividend and Market prices per share

When variables produce a stationary series $I(1)$, co-integration among them in the long run is feasible. To establish the existence of long run relationship among variables, a co-integration test is performed using the Johansen's co-integration test.

Johansen Co-integration test

Dividend per share and Market price per share

Table 4. 4. 1

Hypothesized	No. of CE(s)	Eigen value	Trace Statistics	0. 05 Critical Value
Prob**	Max-Eigen Statistic	0. 05 Critical Value	Prob**	None*0. 83565023.
5240015. 494710. 002523. 4748114. 264600. 0014	At most 10. 0037770.	0491903. 8414660. 82450. 0491903. 8414660. 8245	Trace test indicates 1	
co-integrating eqn(s) at the 0. 05 level* denotes rejection of the hypothesis at the 0. 05 level**MacKinnon-Haug-Michelis (1999) p-values				
From table 4. 4. 1 above, the Trace statistics, Max-Eigen value and Mackinnon-Haug-Michelis (1999) p-values show that the null hypothesis of no co-integration was rejected in favour of the alternative hypothesis at 0. 05 level. Their values as indicated in the tables are greater than the critical values at 0. 05 level. This means that there exists long run relationship among the variables. The Trace test as well as the Max-Eigen test indicates one co-integrating equation and this is followed in this study. In order to study the relationship between the independent variable MPS and the dependent variable DPS, it is show below that there is one co-integrating equation in the series. Long run Normalized Co-integration Estimates				
Log likelihood	-26. 38760	Normalized co-integration coefficients	DPS	MPS
1. 000000	-0. 264047(0. 03905)	[6. 761766]	Standard error	

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(), t-statistics []The equation above shows that Market price per share is directly related to Dividend per share. This implies that in the long run, market price per share has a positive impact on dividend per share. The result states that a 1% change in market price per share would cause a 0.26% change in dividend per share.

Market price per share and Dividend per share

Table 4. 4. 2HypothesizedNo. of CE(s)Eigen valueTrace Statistics0. 05 Critical ValueProb**Max-Eigen Statistic0. 05 Critical ValueProb**None*0. 83565023. 5240015. 494710. 002523. 4748114. 264600. 0014At most 10. 0037770. 0491903. 8414660. 82450. 0491903. 8414660. 8245Trace indicates 1 co-integrating eqn(s) at the 0. 05 level; Max-Eigen value test also indicates 1 co-integrating eqn(s) at the 0. 05 level*denotes rejection of the hypothesis at the 0. 05 level** MacKinnon-Haug-Michelis (1999) p-valuesFrom table 4. 4. 1 above, the Trace statistics, Max-Eigen value and Mackinnon-Haug-Michelis (1999) p-values show that the null hypothesis of no co-integration was rejected in favour of the alternative hypothesis at 0. 05 level. Their values as indicated in the tables are greater than the critical values at 0. 05 level. This means that there exists long run relationship among the variables. The Trace test as well as the Max-Eigen test indicates one co-integrating equation and this is followed in this study. In order to study the relationship between the independent variable DPS and the dependent variable MPS, it is show below that there is one co-integrating equation in the series.

Long run Normalized Co-integration Estimates

Log likelihood -26.38760 Normalized co-integration coefficients MPSPS1.
000000-3.787199(3.10514)[1.219654] Standard error (), t-statistics []
The equation above shows that Dividend per share is directly related to Market price per share. This implies that in the long run, dividend per share has a positive impact on market price per share. The result states that a 1% change in dividend per share would cause a 3.78% change in market price per share.

4.5 Causality tests for Vector Error Correction Modeling

This study examined the short run dynamics between the variables in the co-integrating equations by estimating the error correction model. This estimation is presented in the Tables below. Essentially, variable Y is said to be Granger-caused by variable X if X helps in predicting Y. However, this is so if the coefficients of the lagged Xs are statistically significant at a given level- 0.05 level. The ECM coefficient is known as the speed adjustment factor, it tells how fast the system adjusts to restore equilibrium. It captures the reconciliation of the variables over time from the position of disequilibrium to the period of equilibrium. The results of the VECMs are shown below:

Dividend per share and Market price per share

Variable DPS MPSECM 0.060141[0.62427]-4.043269[-2.28343] t-statistics in []
The significance of the error correction mechanism supports co-integration and suggests that there exists long run steady-state equilibrium between Dividend per share and Market price per share of First Bank. The ECM

indicates a feedback of approximately 6% of the previous year's disequilibrium from long run elasticity of the explanatory variable. That is, the coefficient of the error correction term, measures the speed at which Dividend per share adjusts to changes in the Market price per share in an effort to achieve long run static equilibrium. It can be said therefore that the speed of adjustment is low.

Market price per share and Dividend per share

VariableMPSPDSECM-0. 776543[-2. 31916]-0. 061930[-0. 20682]t-stastics in []The significance of the error correction mechanism supports co-integration and suggests that there exists long run steady-state equilibrium between Dividend per share and Market price per share of First Bank. The ECM indicates a feedback of approximately 77% of the previous year's disequilibrium from long run elasticity of the explanatory variable. That is, the coefficient of the error correction term measures the speed at which Market price per share adjusts to changes in the Dividend per share in an effort to achieve long run static equilibrium. It can be said therefore that the speed of adjustment is high.

4. 6 Discussions of findings

The result of the maximum likelihood normalized to the DPS, shows that the elasticity coefficient of market price per share (MPS) is positive. This is in line with a priori expectation. This indicates that 1% change in market price per share will lead to a 26% change in dividend per share. As indicated by the t-statistic, the market price per share is statistically significant. The result of the maximum likelihood normalized to the MPS, shows that the elasticity

coefficient of dividend per share (DPS) is positive. This is in line with a priori expectation. It indicates that 1% change in the dividend per share will lead to a 3.783% change in market share price. As indicated by the t-statistic, the dividend per share is statistically insignificant.

Dividends per share

First Bank Union Bank UBA Bank AVERAGE
 0.700.250.170.370.700.500.
 330.510.560.550.100.401.000.700.300.671.001.050.580.881.250.
 000.850.701.301.500.251.021.301.250.300.951.501.350.451.101.
 551.400.601.181.601.400.601.200.001.001.000.671.001.001.201.
 071.201.000.750.981.410.000.100.500.000.000.050.02

Market prices per share

First Union Bank Bank UBA Bank AVERAGE
 9.565.887.287.5733337.106.
 006.056.3812.6013.006.2510.629.509.308.008.9311.6911.058.
 4210.3923.8026.9913.8121.5323.5524.9111.5019.9921.0521.335.
 7916.0620.0025.0110.3918.4723.6021.009.0517.8832.0025.4813.
 0023.4933.5022.9125.3127.2444.7043.0649.5045.7521.1115.2013.
 1516.4914.056.0010.8010.2813.734.209.159.03

Johansen Co-integration test result

DPS and MPS Date: 04/23/13 Time: 14:26 Sample (adjusted): 1998

2010 Included observations: 13 after adjustments Trend assumption: Linear
 deterministic trend Series: DPS MPS Lags interval (in first differences): 1 to

1 Unrestricted Co-integration Rank Test (Trace) Hypothesized Trace 0.05 No. of

CE(s) Eigen value Statistic Critical Value Prob.** None * 0.83565023.5240015.

494710.0025 At most 10.0037770.0491903.8414660.8245 Trace test

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indicates 1 co-integrating eqn(s) at the 0.05 level* denotes rejection of the hypothesis at the 0.05 level**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05	No. of CE(s)	Eigen-value	Statistic	Critical Value	Prob.
None	*	0.83565	0.23	4.7481	11.4264	6.0014	At most 10.

0.0037770.0491903.8414660.8245

Max-eigen-value test indicates 1 co-integrating eqn(s) at the 0.05 level* denotes rejection of the hypothesis at the 0.05 level**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Co-integrating Coefficients (normalized by b'S11*b= I): LOGDPS DMPS-0.6727120.1776283.6847320.016485

Unrestricted Adjustment Coefficients (alpha): D(LOGDPS)0.690249-0.022439D(DMPS)-5.651404-0.562785

1 Co-integrating Equation(s): Log likelihood-53.96520

Normalized co-integrating coefficients (standard error in parentheses) LOGDPS DMPS 1.000000-0.264047(0.03905)

Adjustment coefficients (standard error in parentheses) D(LOGDPS)-0.464339(0.10684) D(DMPS) 3.801765(2.12901)

MPS and DPS Date: 04/23/13 Time: 14:29 Sample (adjusted): 1998 2010

Included observations: 13 after adjustments Trend assumption: Linear deterministic trend Series: MPS DPS Lags interval (in first differences): 1 to 1

Unrestricted Co-integration Rank Test (Trace)

Hypothesized	Trace	0.05	No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.
None	*	0.83565	0.23	5.2400	15.4947	10.0025	At most 10.

0.0037770.0491903.8414660.8245

Trace test indicates 1 co-integrating eqn(s) at the 0.05 level* denotes rejection of the hypothesis at the 0.05 level**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05	No. of CE(s)	Eigen value	Statistic	Critical Value
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ValueProb.**None *0. 83565023. 4748114. 264600. 0014At most 10.
 0037770. 0491903. 8414660. 8245Max-eigen value test indicates 1 co-
 integrating eqn(s) at the 0. 05 level* denotes rejection of the hypothesis at
 the 0. 05 level**MacKinnon-Haug-Michelis (1999) p-valuesUnrestricted Co-
 integrating Coefficients (normalized by $b'S_{11}b = I$): DMPSLOGDPS-0.
 1776280. 672712-0. 016485-3. 684732Unrestricted Adjustment Coefficients
 (alpha): D(DMPS)5. 6514040. 562785D(LOGDPS)-0. 6902490. 0224391 Co-
 integrating Equation(s): Log likelihood-53. 96520Normalized co-integrating
 coefficients (standard error in parentheses)DMPSLOGDPS1. 000000-3.
 787199(3. 10514)Adjustment coefficients (standard error in
 parentheses)D(DMPS)-1. 003846(0. 56216)D(LOGDPS)0. 122607(0. 02821)

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSION

5. 1 Summary

This study has considered the relationship between dividends per share and market prices per share of selected deposit money banks in three Nigeria, namely First Bank, Union Bank and the United Bank of Africa (UBA). The specified model was estimated using the co-integration technique. In general, the result shows that there is a long run relationship between dividend per share and market price per share of the three banks. This proves that dividend policy does affect the stock prices of firms. The study indicates a positive relationship between dividend per share and market price per share. It shows that a 1% change in dividend per share will lead to a 3. 783% change in market price per share. The study also shows that a 1% <https://assignbuster.com/causality-tests-for-vector-error-correction-modeling-economics-essay/>

change in market price per share will lead to a 26% change in dividend per share. The study reflects the important place of a firm's dividend policy in the determination of its stock price. Such policies that will affect the value of a firm's dividend to shareholders have to be made with caution as they could affect the stock prices of the firm and ultimately, its market capitalization.

5. 2 Conclusion

In this study, an attempt has been made at articulating the issues of dividend policy on the value of selected deposit money banks in Nigeria. The findings of this study, reveals that an increase in dividend will lead to an increase in market price per share which concludes that a relationship exists between dividend per share and market price per share of firms. The study also concludes that the dividend policy of firms affect their stock prices and therefore, their value.

5. 3 Recommendations

Based on the results of this study, the following recommendations are made: The study recommends that more attention be paid by firms to the formulation of their dividend policies as this impact their share prices and their value. The more is paid to shareholders, the more attractive the stock of the firm is. This increases the demand for portions of the firm's equity and the result is an upward pressure on the share price of the firm. This also increases the firm's value.

5. 4 Suggestions for further studies

Further research could expand the study beyond the banking industry and make it cut across other industries such as oil and gas, telecommunications,

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etc, to examine if there is an industry bias in the impact of a firm's dividend policy on its stock price.