

# 8. The Impact of Conservation Information on Average Abnormal Return Time Series Analysis

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## **The Impact of Conservation Information on Average Abnormal Return: Time Series Analysis**

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### **Abstract**

The aims of this research are to examine the impact of conservation-based information to average abnormal return of firms. The data which used in this research are all of the news regarding corporate action especially conservation-based information that gathered from *Bisnis Indonesia* from July 2016 through August 2017. All of the firm which also listed in *Sri Kehati Index*. The order of the examination within this research are (1) stationery test (2) ARCH or GARCH test (3) Dummy test (Least Square Dummy Variable) and (4) Hypothesis test). The results show that the change in AAR is not influenced by conservation publication made by *Bisnis Indonesia*. It means that the average AAR difference occurs only in the sample yet the result cannot be generalized in capital market in Indonesia.

**Key words:** Abnormal return, conservation-based information, Times Series Analysis.

### ***Dampak Informasi Konservasi Pada Rata-rata Abnormal Return: Sebuah Analisis Time Series***

#### *Abstrak*

*Penelitian ini bertujuan untuk mengetahui dampak informasi konservasi terhadap perbedaan rata-rata abnormal return. Data sekunder yang dipergunakan dalam penelitian ini adalah berita atau informasi "positif" atau "negatif" dari emiten yang termasuk dalam indeks Sri Kehati dan dimuat dalam Harian Bisnis Indonesia periode Juli 2016 sampai dengan Agustus 2017. Tahapan analisis data adalah (1) uji stasioner (2) Uji Arch / Garch, karena tidak mengandung heterokedastisitas maka menggunakan model Arch (3) Uji Dummy (LSDV) dan (4) Uji Hipotesis. Hasil penelitian menunjukkan bahwa tidak terdapat perbedaan rata-rata abnormal return di sekitar informasi "positif" atau "negative" mengenai konservasi. Hal ini terjadi karena informasi tersebut tidak mempunyai kandungan ekonomis bagi investor maupun perusahaan.*

**Kata kunci:** Abnormal return, Informasi konservasi, Analisis Time Series.



## INTRODUCTION

The information used by investors in making decisions can be classified into quantitative information (numerical, such as financial statements, balance sheet) and qualitative information (textual, such as news in newspaper, magazine). Qualitative (textual) information explains more to and makes it easier for investors in understanding risks (Shang, et al., 2014; Visscherrs et al., 2009) compared to the quantitative one such as that in financial statements. Even managers prefer qualitative information about the market whenever possible (Schleicher and Walker, 2010; Guillanmon-Saorin et al., 2012). Many studies have recently developed the use of information qualitative to predict future risks the company may encounter (Davis, et al, 2006; Li, 2006). The qualitative information takes the form of textual analysis by dividing information into negative and positive tones. The information in negative tone description has more effective relationship with financial variable, including corporate risks (Loughran and McDonald, 2011). Even a positive sentence made in negative tone is more effective than the positive tone itself. For example, such tone as “does not experience any sales turnover decrease” is more effective than “experiences sales increase”. Shang et al., (2014) explain that in addition to negative tone, also imposing negative influence on adjusted return are positive tone and uncertainty. In addition to tone in textual information, information coverage also taken into account in textual analysis (Shang, et al., 2014). Tetlock et al., (2008) conduct research by combining data from Wall Street Journal (WSJ) and Dow Jones News Service (DJNS) and reveal that there is actually negative relationship between negative tone and earning prediction and company’s return is influenced by the effectiveness of media coverage. Therefore, this research uses Bisnis Indonesia mass media, with its national coverage and its information is frequently used by investor in making decisions.

What the society recently demands from the current government and companies is “conservation” corporation. The government through Law on Limited Liability Company number 40 year 2007 article 74 paragraph (1) explains that companies should pay some attention to the environment and social life. Additionally, the demand for “conservation”

corporation is also stated in Law Number 32 Year 2009 concerning Environmental Protection and Management.

This research aims at (a) discovering the average abnormal return prior to any publication of conservation information (b) figuring out the average abnormal return after the publication of conservation information (c) finding out the impact of positive and “negative” “conservation” textual information on average abnormal return ?

## LITERATURE REVIEW

Fama (1970) defines an efficient market as a place where a price always fully illustrates the entire available information. Formally, an efficient capital market is defined as the market where the price of its securities has reflected all relevant information. The faster the new information is reflected on the security price, the more efficient the capital market would be. The speed at which a market respond to this new information becomes less meaningful when the market fail to respond to such information accurately.

For this reason, rational investors should have used all relevant information in making decisions, bot the decisions to purchase and to sell shares. Information is a determinant factor of share price change and it becomes a central issue in the capital market efficiency concept. The prices of new shares will be different when new information appears. Therefore, capital market efficiency is frequently called also as informational efficiency. Hence, in this research it is assumed that the capital market in Indonesia is an efficient capital market since this research wants to test textual information on conservation and reflect it into investment risks for companies.

Information plays an important role in share market, because information will influence investor’s perceived risks which, in turn, will affect the share price. Most previous studies rely more on quantitative information (numeric) to explain the risks for investors. However, it is quite frequent that quantitative information is multi-interpreted and find it hard to explain risks. In addition, not everyone can interpret these numeric data, making it easier to understand qualitative information (Visscherrs et



al., 2009). Li (2006) reveals that the words “risk” and “uncertain” in a company’s annual report predicts negative annual return and stock return. Davis., et al.(2006) suggest a finding which confirms Li (2006) regarding the use of tone (qualitative information) and its ability to predict earning, and share return.

Tetlock et al. (2008) integrate studies in WSJ and Dow Jones News Service (DJNS), focusing on the impact of negative sentences and find its impact on earning and share return. Furthermore, this research finds that negative sentence when it is published in mass media would be the one which influence the share price performance effectiveness. The research uses risks as a dependent variable because the volatility (variance) of earning and share return are influenced by business risks, which can be proxied with adjusted return (Shang et al, 2014).

CSR report that released by company contain information about conservation activities that company do. Company believe that with CSR disclosures, the consumer’s perception of firm about ethical and integrity standard, promote social and economic development and also improve environment will enhanced (Hsu et al., 2013). Argenti and Druckenmiller (2004) propose the idea about CSR as tools to create reputation effect, which suggest that firms aiming to build and maintain good reputations must be enthusiastic about CSR activities. Those arguments believe that firm with higher CSR or conservation based-activities tend to have a higher financial performance (Lee et al., 2011; Liang & Huang, 2013).

Previous studies in this field of qualitative (textual) information can be divided into two categories, namely in regard to media coverage and the tone in such information. This research is conducted in two categories, namely information in mass media, in this case the selected one is *Bisnis Indonesia* (Business newspaper with Indonesia-wide coverage) and the sentences contained in these news. Thus, the hypothesis in this research is that will textual information (tone) on either “negative” or “positive” conservation delivered by the mass media have some impact on average abnormal return.

**METHODS**

This research uses quantitative approach and it is of explanatory type aiming at testing semi-strong market form hypothesis.

The data in this research are the secondary ones in the form of closing share prices in 5 days before and 6 days after announcement or publication of conservation. The data on price are taken from securities and conservation information is taken from *Bisnis Indonesia*. The data are collected using documentation instrument.

The measurement of variables in this research develops the model from Shank et al (2012) as can be seen in table below.

**Table 1. Variable Measurement**

Variable	Measurement	Data and Data Source
Positive Words (POS)	Total numbers of positive words regarding conservation information to total number of words	<i>Bisnis Indonesia</i> from July 2016 through August 2017
Negative Words (NEG)	Total numbers of negative words regarding conservation information to total number of words	<i>Bisnis Indonesia</i> from July 2016 through August 2017
Abnormal Return	Average abnormal return	Daily stock return within 12 days observation windows on consevation-related news

The equation in this research model is:

$$AAR = \alpha + \beta \text{ Dummy} + e$$

The dummy category is labelled as 0 if it is the news contain negative words and labelled as 1 if otherwise. The analysis to be used in this research is GARCH model (p,q) from the data deriving from daily abnormal return of the research sample issuer’s share. Upon acquisition of data on such daily share return, the next phase will be done.

**Stationery Test**

The analysis done is level-wide root test through Augmented Dickey-Fuller (ADF) test. The aim is to determine the length of lag in a time series model.

**ARCH & GARCH Test**

The ARCH test is used to discover whether or not the residue in the data has heteroscedasticity as a requirement of GARCH (p,q) modelling. If the data are not in heteroscedasticity state, the test is continued for OLS model. If the chi square is greater

than 5%, then the model does not contain any heteroscedasticity and hence it is followed with OLS model. However, if the chi square is less than 5%, it means heteroscedasticity occurs and it should be continued in GARCH model.

In OLS model, the homoscedaticity assumption should be fulfilled, however when it happens, then the modelling can be done with GARCH model. This GARCH model assumes that data variance is fluctuating and influenced by a number of p of prior data variance and a number of q of prior data volatility. Thus, this model accommodate the heteroscedasticity which should be fulfilled in OLS.

The hypothesis testing is done after a conclusion is drawn regarding whether to use ARCH or GARCH models. The hypothesis tested in this research is capital market in Indonesia is a semi-strong form, therefore both positive and negative information (tone) will have some impact on average abnormal return.

## RESULTS AND DISCUSSION

The descriptive statistic shows that the average abnormal return in three companies for 5 days prior to and 6 days after conservation activity announcement (12-day observation) is 0.03%. Additionally, it is found that the Jarque-Bera probability is 0.806, which is greater than alpha (0.05). It is therefore can be interpreted that the residual data are distributed normally.

**Table 2. Descriptive Statistics Average Abnormal Return**

	AAR
Mean	0.000347
Median	-0.000359
Maximum	0.023297
Minimum	-0.020202
Std. Dev.	0.013545
Skewness	0.298502
Kurtosis	2.289802
Jarque-Bera	0.430397
Probability	0.806381
Observations	12

**Table 3. Unit Root Test**

Variable	Unit Root
AAR	-5.05***

**Table 4. Augmented-Dickey Fuller Unit Root Tets**

Variable	ADF
C	-0.0011 (-0.3263)
AAR (-1)	-1.363*** (-5.052)
R2	0.739
Adj. R2	0.710
F. Stat	25.532
Prob (F.Stat)	0.000

$H_0 : \delta = 0$  (there is a unit root, unstationary)  
 $H_1 : \delta \neq 0$  (there is no unit root, stationary)

From the results of unit root testing in table 3, it is found that the t stat value in ADF is greater than the t critical value 1% 5% 10%, thus it can be interpreted that  $H_0$  is rejected and  $H_1$  is confirmed. This result shows that there is no unit root.

From the result of ADF unit root testing in table 4 found that AAR (average abnormal return) data are stationary at level rate. Stationary data are the ones showing that the mean, variance and autocovariance (in lag variance) remain the same at all time when the data are formed or used, meaning that with stationary data, a time series model can be said as more stable.

Based on the result on stationary test, it is found that statistically the AAR data change for a period of 5 days prior to publication and 6 days after conservation publication made by the mass media is stationary at level rate (0.0028 < 0.05). It can then be interpreted that the mean, variance, covariance data are not influenced by time.

**Table 5. ARCH Test**

Variable	ARCH
C	-0.000 (-0.1084)



Continued of Table 5. ARCH Test

Variance Equation	
C	7.05 (1.004)
Resid (-1)	-0.420 (-1.349)
GARCH (-1)	0.955 (2.728)
R2	0.031
Adj. R2	0.033

ARCH test shows that the data do not contain heteroscedasticity, hence ARCH model can be used, as follows. ARCH model assumes that the change of time series residual data variance is not only influenced by the independent variable, but also influenced by the residual variable under investigation. The testing result indicates (table 5) that the residual data variance does not experience any heteroscedasticity or it has been homogeneous. The implication is that rather than being followed by GARCH modeling, OLS will be used instead.

### Hypothesis Testing

The objective of this dummy analysis is to calculate the average of AAR (average abnormal return), as in the following table 6. From the dummy analysis result, it is found that the Average Abnormal Return value is insignificantly influenced by publication event (insignificant with probability value greater than 5%).

Table 6. Hypothesis Testing

	AAR
C	0.001 (0.1652)
Dummy	-0.001 (-0.144)
R2	0.002
Adj. R2	0.009
F. Stat	0.0209
Prob (F.Stat)	0.8878

If after the conservation announcement or publication the D1 is 1 and prior to it is 0, then the said equation can be interpreted that the average AAR after conservation publication is  $0.0010 - 0.0012 = -0.0002$  while the average AAR prior to conservation publication is 0.0010. This indicates that the average

AAR prior to conservation publication is greater than before. This finding shows that prior to conservation information in Bisnis Indonesia, the market has more positive response than after it.

Based on the dummy testing, the hypothesis testing shows that the change in AAR is not influenced by conservation publication made by Bisnis Indonesia. It means that the average AAR difference occurs only in the sample yet the result cannot be generalized in capital market in Indonesia.

### CONCLUSION

The stationary testing shows that the movement of share prices resulting in abnormal return is random and it is not influenced by prior prices or, in other words, it is independent. Therefore, thanks to this stationary the data can proceed for the testing of AAR difference caused by conservation information published in Bisnis Indonesia.

Fama (1991) develops EMH- Efficient market hypothesis, Fama (1970) who is initially in weak, semi-strong and strong forms turn into a testing of return estimation, event study and testing of corporate information. An efficient market, i.e. equilibrium price in market, is caused by the existence of information regarding companies. This information can take a form of past information (historic, public or private).

Information on conservation activities which constitute a social and environmental responsibility of Limited Liability Company as set out in Law on Limited Liability Company Number 40 year 2007 based on the efficient, semi-strong form hypothesis should have corrected share prices. Yet, the research finds that statistically it does not show abnormal AAR.

All public information on conservation does not reflect or correct share prices which will result in abnormal return. Conservation information in both positive and negative tones does not have any influence on abnormal return. The results of previous study (Shang et al., (2014) is rejected, i.e. positive tone in public information will give positive abnormal and negative tone in public information will give negative abnormal.

Information or publication on conservation cannot be



used to obtain abnormal return, neither the positive nor the negative conservation information. This is because the conservation information published in *Bisnis Indonesia* has not been any information with “economic” content for investors in Indonesia capital market. It means the awareness of conservation information has not been an added value for market actors in general or the market appreciates non-conservation information in financial or macro economic form better, as explained by Dodd (1992) that in US capital market, abnormal return occurs after a merger is announced. Hadi (2003) concludes that in India capital market, financial information will have some influence on abnormal return. Liu, Smith and Syed (1990) suggest that the price existing in market will change or is influenced by disclosure of news in “*Heard on the Street*” column in *Wall Street Journal*. Rizkianto and Surya (2014) explain that share price will experience volatility as a result of macro economic conditions (inflation, exchange rate, IHSG, crude oil price).

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