

SENTIMENT, RETURN AND VOLATILITY ON BANKS IN INDONESIA

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Abstract. We study the effect of sentiment with returns and volatility. We predict that sentiment has a large effect on securities valuation, which makes it difficult to arbitrage. A research uses a multiple linear regression analysis. Consistent with these predictions, the results of this study find that returns have a significant negative effect on sentiment while volatility has a significant positive effect. The results of this study indicate that sentiment with returns has a correlation inversely, if the sentiment rises then the return has decreased or vice versa. Another proof of this research is that sentiment moves in the direction of volatility.

Keywords: Sentiment, Return, Volatility

1. INTRODUCTION

Standard financial theory defines that securities returns reflect company-specific fundamentals, assuming investors think rationally and markets are in efficient conditions. On the contrary, theory of behavioral finance, as a new era of financial theory, argues that behavior and cognitive psychology theories are implemented to explain irrational behavior in making investment. Sentiment is the main concept in behavioral financial theory, thus it motivated researchers to prove. Sentiment, commonly referred to as investor sentiment or market sentiment, can be defined as all investor behaviors regarding securities or financial market conditions.

Proof of sentiment discovers that sentiment affects market aggregates and cross-section returns. Literature has noted that various proxies can be used to measure sentiment, however there is no suitable proxy agreement to date. The sentiment proxy can be classified into two types; direct and indirect. Direct measurement of sentiment is carried out by investor response survey regarding market fluctuations and economic aggregates used in sentiment index. In contrast to indirect measurement, the sentiment index can occupy one of the selected market statistics measures. There are six most famous sentiment indices proposed by Baker & Wurgler (2006) based on measurement of market statistics. Some proxies of indirect sentiment indexes are put/call ratio, changes in the trade money, natural logarithms of stock trading volume and so on.

This study examined the effect of sentiment on returns and volatility in Indonesia. The research sample chosen was banking, because it was the financial services company that was most attractive to investors, reflected in the number of banks included in the LQ45 index. To prove the study, it selected daily data on Indonesian stock exchanges from 2015-2017. The argument established in this study was based on empirical evidence which had a negative effect on securities returns (Baker & Wurgler, 2006, 2007; Cliff & Brown, 2005). Furthermore, current studies discovered that sentiment affected market volatility (Sadaqat & Butt, 2016; Yang & Copeland, 2014).

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2. LITERATURE REVIEW

2.1. Literature Reviews

2.1.1. Sentiment

The researchers believe that sentiment is significantly affected on economy. However it is still abstract since there is no fixed definition of sentiment in the literature. According to capital.com, sentiment is the general mood of investors on certain markets or assets. Another general definition of sentiment is belief or personal judgment which is not based on evidence or certainty (www.vocabulary.com/dictionary/sentiment). Cambridge English Dictionary states that Sentiment is: 'a thought, opinion, or idea based on feeling about a situation'. In investment context, it can be broadly interpreted as fluctuations in risk tolerance or prediction of cash flow which is too optimistic or pessimistic (Chau, Deesomsak, and Koutmos, 2016).

2.1.2. Sentiment Proxy

The research development on sentiment for the past two decades presents no agreement on the best method for measuring it. There are several proxies used to measure sentiment. Theoretically, measurement of sentiment has two categories, which are based on surveys and market conditions. An index based on a survey conducted through an opinion questionnaire or investor opinion can also be obtained through gathering news in the mass media. In contrast, market based indices take indirectly the financial statistics on the market as proxies.

2.1.3. Sentiment on financial markets

Baker, Wurgler, & Yuan (2009) conducted a test on global markets based on the Baker & Wurgler (2006) methodology. Researchers tested local and global factors which affected sentiment in various countries. Supporting to previous studies, empirical results support the theory of the difficulty on arbitration due to sentiment.

Chau et al. (2016) examine the role of sentiment and manifestations of investor behavior in the United States. This study explores the effects of investors and their behavior which affecting fluctuation in stock prices. In general, empirical evidence supports the opinion that stock buying and selling is affected by sentiment, so sentiment is an important determinant of the variation in stock prices. Specifically the results of the study prove; (1) sentiment is an important factor, even some groups of investors are encouraged to trade so that stock prices fluctuate, (2) investors are more interested in trading based on survey information than using market statistical indicators, (3) investors who do trading in stocks trust more to the results of individual investor surveys than institutional investors, (4) sentiment is asymmetrically related with reducing (increasing) sentiment in the market.

Frijns, Verschoor, & Zwinkels (2017) had noted the increasing international market correlation, thereby reducing the usefulness of international diversification. This study occupies long-term data by dividing the return component from fundamental and non-fundamental factors. The results of the observation indicate that the increase in returns caused by non-fundamental factors is not a fundamental factor. The next proof is to put the sentiment into the test, the result describes that the increase in returns from non-fundamental factors is driven by sentiment.

Research on sentiment is not only conducted in developed markets but also in emerging markets. Mehrani, Rahnamay, & Nekomaram (2016) conducted sentiment testing on returns, excess returns, and volatility in Tehran. Their research analyzed contrarian and momentum strategies related to optimistic (pessimistic) conditions and compared them with neutral market conditions.

To evaluate the sentiment, Arms index was implemented. The results of the analysis illustrated that the formation of short-term portfolios (1-3 months) in optimism and pessimism did not provide additional returns and even experienced loss. In addition, by adding a period of neutral sentiment to behavioral financial strategies, it could improve performance and found more effective contrarian strategies than momentum.

2.2 Research Hypothesis

Baker & Wurgler (2006) proved that sentiments cause mispricing, thus making it difficult for shares to be traded. Cliff & Brown's (2005) argued that sentiment was a persistent effect so prices occurred in the market was biased and continued to be mispricing. Not all researchers can prove the effect of sentiment on return. There were several other studies discovered that sentiments presented no effect on stock returns (Derrien and Kecskes, 2009; Paudel and Laux, 2010). To confirm the sentiment and return correlation, it is necessary to have a re-test. This study referred to sentiment empirical evidence which had a negative effect on returns (Baker & Wurgler, 2006, 2007; Cliff & Brown, 2005). We examined the correlation between sentiment and the stock return of banks in Indonesia, the hypothesis proposed was:

Hypothesis 1: Sentiment had a significant negative effect on stock returns.

Studies on sentiment are now growing. The new findings proved that sentiment also affect market performance. The market performance is observed through fluctuations in stock prices, the higher the fluctuations in stock prices in the market, the higher the level of risk faced by investors. The movement of stock prices is proxied by volatility. Sadaqat & Butt (2016) proved that the condition of bullish (bearish) sentiment caused market volatility to increase (decrease). Another empirical evidence with cross-section testing proved that the short term and long term stock prices had a significant negative correlation with volatility (Yang & Copeland, 2014). The analysis in this study was based on sentiment arguments which had a positive effect on volatility, so the hypothesis proposed is:

Hypothesis 2: Sentiment had a significant positive effect on stock returns.

Theory of Behavioral finance focuses more on market emotions than rational thinking. Thus, sentiment has a role in affecting market performance. This study analyzed the role of sentiment on market performance in Indonesia, including emerging markets. It was interesting to observe because Indonesia was intensively introducing the stock market to the public by launching "Menabung Saham" program in 2015. The program was successful considering the increase to the number of investors into 106% in 2016. The study expected to fill the gap by exploring the role of sentiment in the market based on arguments established by Baker & Wurgler (2006) and Sadaqat & Butt (2016).

3. DATA AND METHODOLOGY

The research obtained data from daily stock trading data of 14 banking companies in Indonesia. Hypothesis testing period was from 2015-2017, with 780 days of trading days. Trade data was collected from *www.yahoofinance.com*.

Sentiment proxies were measured through models from (Ryu, Kim, & Yang, 2016). This sentiment proxy was selected to facilitate the analysis since not all market information was published in emerging market. Information on trading volume was easily obtained by all market companies, so it was suitable to be used as a proxy for sentiment in emerging market which experienced limited market information.

$$LTV_{i,t} = \text{Ln} (V_{i,t}) \quad (1)$$

$V_{i,t}$ = trading volume of stock i at time t

Return was analyzed by closing price and open price to eliminate stock price fluctuations in one trading period. The formula was:

$$R_{i,t} = \frac{P_{closing} - P_{open}}{P_{open}} \times 100 \% \quad (2)$$

The volatility formula utilized a range-based model (Alizadeh, Brandt, & Diebold, 2002). Measuring the volatility through range-based was able to overcome market microstructure, and was more normally distributed than other volatilities measurement (Blau & Whitby, 2017)

$$\text{Vol}_{i,t} = \text{Ln} (H_{g_{i,t}}) - \text{Ln} (L_{w_{i,t}}) \quad (3)$$

$H_{g_{i,t}}$ = High price of stock i at time t

$L_{w_{i,t}}$ = Low price of stock i at time t

Sentiments test was conducted based on the regression equation below:

$$LTV_{i,t} = a_0 + b_1R_{i,t} + b_2\text{Vol}_{i,t} + \varepsilon_{i,t} \quad (4)$$

4. EMPIRICAL EVIDENCE

Table 1 contained the descriptive data of the research variables. Positive mean and median variables were only on LTV whose values were very high. Standard deviation of returns and volatility were smaller than $\alpha_{0.05}$, on the other hand LTV was bigger than $\alpha_{0.05}$ or equal to 2.089134. The minimum score of volatility was 0.0% and the maximum was 29.4508%, indicating that there was a neutral period of market volatility as reflected by the score of 0%. The maximum return score was 0.298051 and minimum was -0.339408, which gave an illustration to investors to get a maximum profit of 29.80% and experience a greater loss of 33.94% during the study period.

Table 1: Descriptive Data of Research Variable

	LTV	RETURN	VOL
Mean	15.57261	0.003387	0.029733
Median	15.93753	0.005650	0.024491
Maximum	20.15470	0.298051	0.294508
Minimum	1.386294	-0.339408	0.000000
Std. Dev.	2.089134	0.026855	0.021896

Table 2 presents the correlation between variables to test multicollinearity. The results of the correlation test in table 2 illustrated a correlation which was smaller than 0.6, so that there was no multicollinearity between independent variables.

Table 2: Multicollinearity Test

	Return	Vol
Return	0.000721103	0.000117233
Vol	0.000117233	0.000479365

Heteroscedasticity test illustrated that all independent variables had a greater significance than 0.05, it proved that there was no indication of heteroscedasticity. For more information can be seen in the table 3 as follows.

Table 3: Result of Heteroscedasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.17E-09	0.026443	4.41E-08	1.0000
X1	9.63E-09	0.579375	1.66E-08	1.0000
X2	-4.27E-08	0.710600	-6.01E-08	1.0000

R-squared	0.000000	F-statistic	0.000000
Adjusted R-squared	-0.000200	Prob(F-statistic)	1.000000
		Durbin-Watson stat	0.482814

The results of the test presented that the Durbin-Watson value was 0.482814, then a correction was made with the Cochrane-Orcutt model. Correction of autocorrelation could be resolved with just only one treatment. The correction results of autocorrelation with the Cochrane-Orcutt method can be seen in the table below:

Table 4: The Result of Autocorrelation test with Cochrane-Orcutt Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.00595	0.081805	183.4353	0.0000
Return	-0.817652	0.301509	-2.711867	0.0067
Vol	19.12690	0.489515	39.07317	0.0000
AR(1)	0.872831	0.004886	178.6285	0.0000
R-squared	0.760827	F-statistic		10581.30
Adjusted R-squared	0.760755	Prob(F-statistic)		0.000000
		Durbin-Watson stat		2.616909

The regression equation is as follows:

$$LTV = 15.00595 - 0.817652\text{Return} + 19.12690\text{Vol} + [\text{AR}(1) = 0.872831, \text{UNCOND}]$$

The results of the analysis discovered an empirical evidence that sentiments and returns presented a significant negative correlation, it corresponded to the arguments of (Baker & Wurgler, 2006). The negative correlation between sentiment and return provided a belief that returns could decrease if sentiment was high. Investors would hold for trading securities if sentiment conditions were high. On the contrary, if sentiment was low, investors did the transactions to obtain a certain level of profit.

Another empirical evidence from this study was that sentiment and volatility had a significant positive correlation, it corresponded to the opinions of (Sadaqat & Butt, 2016). A positive correlation indicated that sentiment and volatility were in line, if sentiment was high then volatility was also high. This study proved that volatility as a risk would increase as sentiment in the market increased. This condition provided an illustration for investors to pay more attention on the sentiment conditions in the market in order to avoid the risk of losses.

5. CONCLUSIONS

Sentiment measurement can be done through various indices which there are no consensus between researchers and literature to date. Sentiment measurement based on market-based can be done through a sentiment proxy whose data is easily obtained from market statistics, especially from emerging market. This study confirmed the opinion (Baker & Wurgler, 2006) and (Sadaqat & Butt, 2016). The results of this study provide information to investors to trade stocks when sentiment is low to avoid the risk of losses.

REFERENCE

- Alizadeh, S., Brandt, M. W., & Diebold, F. X. (2002). Range-Based Estimation of Stochastic Volatility Models. *Journal of Finance*, LVII(3), 1047–1091.
- Baker, M., & Wurgler, J. (2006). Investor sentiment and the cross-section of stock returns. *Journal of Finance*, 61(4), 1645–1680. <https://doi.org/10.1111/j.1540-6261.2006.00885.x>
- Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of Economic Perspectives*, 21(2), 129–151. <https://doi.org/10.1257/jep.21.2.129>
- Baker, M., Wurgler, J., & Yuan, Y. (2009). Global, Local and Contagion Investor Sentiment. Retrieved from <http://www.dallasfed.org/assets/documents/institute/wpapers/2009/0037.pdf%0AGlobal>,
- Blau, B. M., & Whitby, R. J. (2017). Range-based volatility, expected stock returns, and the low volatility anomaly. *PLoS ONE*, 12(11), 1–19. <https://doi.org/10.1371/journal.pone.0188517>
- Chau, F., Deesomsak, R., & Koutmos, D. (2016). Does investor sentiment really matter? *International Review of Financial Analysis*, 48, 221–232. <https://doi.org/10.1016/j.irfa.2016.10.003>
- Cliff, M. T., & Brown, G. W. (2005). Investor Sentiment and Asset Valuation. *Jstor*, 78(2), 405–440. <https://doi.org/10.2139/ssrn.292139>
- Derrien, F., & Kecskes, A. (2009). How Much Does Investor Sentiment Really Matter for Equity Issuance Activity? *European Financial Management*, 15(4), 787–813. <https://doi.org/10.1111/j.1468-036X.2008.00476.x>
- Frijns, B., Verschoor, W. F. C., & Zwinkels, R. C. J. (2017). Excess stock return comovements and the role of investor sentiment. *Journal of International Financial Markets, Institutions & Money*, 2(5). <https://doi.org/10.1016/j.intfin.2017.02.005>
- Mehrani, K., Rahnamay, F., & Nekomaram, H. (2016). Behavioral trading strategies and investor sentiment: Empirical research in Tehran Stock Exchange (TSE). *Indonesian Capital Market Review*, 8, 94–109.
- Paudel, J., & Laux, J. (2010). A Behavioral Approach to Stock Pricing. *Journal of Applied Business Research*, 26(3), 99–105.
- Ryu, D., Kim, H., & Yang, H. (2016). Investor sentiment , trading behavior and stock returns. *Applied Economics Letters*, 00(00), 1–5. <https://doi.org/10.1080/13504851.2016.1231890>
- Sadaqat, M., & Butt, H. N. (2016). Modeling Sentiment, Temporal Volatility and Excess Returns: Empirical Evidence From Segmented Stock Market. *Journal of Business & Economic*, 8(2), 202–228.
- Yang, Y., & Copeland, L. (2014). The effects of Sentiment on Market Return and Volatility and The Cross-Sectional Risk Premium of Sentiment-affected volatility (Cardiff Economics Working Papers No. E2014/12).