UDC 334

EXAMINING THE EFFECT OF ACCRUAL PERSISTENCE ON STOCK PRICES THROUGH IDIOSYNCRATIC VOLATILITY IN A FOUR-FACTOR MODEL IN MANUFACTURING COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE

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ABSTRACT

This study aims to determine and analyze the influence of accrual persistence, proxies by the persistence of current operating accrual (ΔCO) and by the persistence of non-current operating accrual (ΔNCO), on stock prices, through idiosyncratic volatility in the four-factor model (IVOL), in manufacturing companies listed on Indonesia Stock Exchange within 2014 to 2017. This study used a panel data regression analyzed using the Eviews 9 tool. The population was all the manufacturing companies listed on the Indonesia Stock Exchange during the study period—this included 37 company samples and 148-panel data. The results of this study prove that accrual persistence (persistence of current operating accrual and persistence of non-current operating accrual) directly does not affect stock prices. However, idiosyncratic volatility in the four-factor model influences stock prices. The existence of idiosyncratic volatility in the four-factor model has helped to mediate the full influence of the persistence of current operating accrual and the persistence of non-current operating accrual on stock prices.

KEYWORDS

Persistence of current operating accrual, persistence of non-current operating accrual, idiosyncratic volatility in the four-factor model, stock prices.

The study of accruals has become a growing area of research at this time. Sloan (1996) and Subramanyam (1996) were early researchers who succeeded in documenting evidence that the market did not use rational information about differences in the persistence of accruals and cash flows. Sloan (1996) has found that the cash flow component of earnings has a higher persistence compared to the accrual component because of the high level of subjectivity in determining accruals. Frankel and Litov (2009) prove that accrual quality can increase or decrease the synchronization of stock prices. Rachmawati and Martani (2014) state that accrual persistency testing is important because it can minimize the occurrence of adverse effects in the form of mispriced securities because investors tend to focus on earnings reports when making their decisions; thus, accrual analysis and cash flow are the solutions to detect the occurrence of mispriced securities. However, those afore-mentioned previous studies show contrasting findings to the results of research by Marselinus Asri *et al*. (2017), which confirmed that the persistence of current operating accruals did not affect stock prices.

The ability of idiosyncratic volatility in determining the formation of stock prices is the other focus of this study. Several previous studies prove that idiosyncratic volatility affects the formation of stock prices, such as Levy (1978), Merton (1987), Harvey and Siddique (2000), Malkiel and Xu (2002), Durnev *et al*. (2003), Jiang, Xu, and Yao (2006), Spiegel and Wang (2006), Eiling (2006), Huang, Liu, Rhee, and Zhang (2007), Boyer, Mitton, and Vorkink (2007), Brockman and Schutte (2007), Bali and Cakici (2008), Fu (2009), Ang *et al*. (2009), Lambert *et al.* (2011), Zhu *et al*. (2014), and Durnev *et al*. (2016). These previous studies

have confirmed a positive correlation between idiosyncratic risk and prices or stock returns. In contrast, the research by Ang, Hodrick, Xing, and Zhang (2006) on G7 countries showed a negative relationship between average yields and idiosyncratic volatility. In line with this, Brockman *et al*. (2009) examined the relationship of idiosyncratic risk and stock returns in 44 international markets and they found a negative relationship in the Australian market. Petrovic *et al*. (2009) also reported a negative relationship between current earnings volatility and future performance.

This study aims to propose a grand theoretical focus on testing the implications and effects of accrual persistence on stock prices through idiosyncratic volatility in the four-factor model. The new concept offered in this study is "idiosyncratic volatility in the four-factor model", that is, the volatility that takes into account idiosyncratic risk factors from the residual value of the yield difference regression in the four-factor model.

LITERATURE REVIEW

Prospect Theory

The prospect theory states that in making decisions, individuals tend to focus on their prospects, namely the profit and loss prospects, not on the total wealth (Kahneman and Tversky, 1979). Investors tend to be risk-averse when they are in the profit domain and risk-seeking when they are in the loss domain. In equilibrium conditions, rational investor demand is not perfectly elastic so the demand for stocks with high idiosyncratic volatility will be greater that stock prices will be higher. In this study, the prospect theory is used to build empirical models regarding the influence of idiosyncratic volatility in a four-factor model on stock prices. Generally, the process of forming a share price started from investment risk considerations; in this case, it is firm-specific risks. The prospect theory in this research model is in line with firm-specific information that is measured by idiosyncratic volatility in a four-factor model and becomes an investor's frame that changes over time.

Real Options Theory

The real options model is a model that can describe the value of a firm in uncertainty and manage the flexibility of its investment strategy (Myers, 1977). In this study, the real options theory is used to build empirical models about the effect of the persistence of current operating accrual and the persistence of non-current operating accrual on idiosyncratic volatility in the four-factor model. The real options model is used in the relationship of accrual persistence and idiosyncratic volatility in the four-factor model to understand corporate investment behavior in industry dynamics and government policies, as well as the content of accrual information on idiosyncratic volatility in the four-factor model.

Asset Valuation Theory: The Four-Factor Model

The four-factor model was introduced by Carhart (1997) included the Fama and French three-factor model plus the PR1YR momentum factor (winner minus loser or up minus down) that captures the momentum anomaly. Carhart (1997) notes that the four-factor model can explain variations in portfolio returns based on past returns and is consistent with the equilibrium market model with four-risk factors. Carhart (1997) affirms that by adding a fourth factor, momentum would reduce the error pricing of portfolio returns. Risk factors considered in Carhart's four-factor model are market risks, company sizes or SMB (small minus big), a book to market/value premium or HML (high minus low), and momentum effect (PR1YR).

Accrual Concepts

In practice, two types of accounting basis exist, namely the cash basis of accounting and accrual basis of accounting. The accrual basis requires recording based on what should be revenues and expenses of a company in a period. Accrual persistence is a condition in which a company can maintain the current amount of accruals for the coming period. Dechow and Dichev (2002) were the first researchers to use the term "accrual quality" to

explain the persistence of accruals. Their findings prove that low accrual persistence is caused by the low quality of accruals.

Idiosyncratic Volatility in the Four-Factor Model

Idiosyncratic volatility in the four-factor model is idiosyncratic volatility in the four-factor asset valuation model that considers idiosyncratic risk factors from the residual value of the yield difference regression to properly describe the time series idiosyncratic volatility of individual stock returns. Idiosyncratic risk/volatility variables are taken into account in the four-factor asset valuation model to capture the relationship and the effect of these idiosyncratic risks on the equilibrium of asset prices or stock values (Levy, 1978). Idiosyncratic volatility in the four-factor (IVOL) model is calculated using a standard deviation of the residual values of the four-factor regression model, as shown in the following equation:

$$Ri_t - Rf_t = \alpha + b_{it}(Rm_t - Rf_t) + s_{it}SMB + h_{it}HML + u_{it}UMD + \varepsilon_{it}$$

Furthermore, the residual value of the results of the regression resulted from the return is entered into the following formula to find idiosyncratic volatility values in the four-factor model (IVOL) as follows:

$$IVOL = \sqrt{Var}(\varepsilon it)$$

METHODS OF RESEARCH

The study was explanatory research that built causal relationships between variables. The analysis in this study employed panel data, a combination of time-series data and cross-section data from 2014 to 2017. The steps to conducting quantitative analysis consisted of:

- estimation of the regression model using panel data;
- selection of panel data regression models;
- classic assumption testing;
- hypothesis testing.

The population in this study was 156 manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2014 to 2017. Based on the purposive sampling method, a sample of 37 manufacturing companies was selected.

RESULTS AND DISCUSSION

Analysis of Model 1

In this study, the test in Model 1 was conducted to determine the effect of the current operating accrual persistence and the non-current operating accrual persistence on idiosyncratic volatility in the four-factor model.

IVOL = -4 ,601019 - 0,176180 ΔCO + 0,408631 ΔNCO + e

Table 1 - The Significance Test of Model 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.601019	1.047476	-4.392480	0.0000
ΔCO	-0.176180	0.057220	-3.079020	0.0025
ΔNCO	0.408631	0.061414	6.653712	0.0000

Source: Output Eviews 9, 2019

The results of the significance test on Model 1 show that the persistence of current operating accruals has a significant negative effect on idiosyncratic volatility in the four-factor model, evidenced by the probability value of 0.0025, which is smaller than the significance

level of 0.05. This means that assessments of changes by investors in current assets and the current debt have different directions on company-specific risks. The higher the value of changes in current assets and current debt, the lower the value of the company's specific risk will be. The results of this study support the research results of Easley and O'Hara (2004), Francis *et al.* (2005), and Gray *et al.* (2009), and Asri *et al.* (2017) confirming that the persistence of current operating accruals has a negative and significant influence on idiosyncratic risk. However, this is different from the research results of Lin and Wang (2011) that accounting information contained in financial statements has a positive influence on idiosyncratic risk.

Furthermore, the results of the significance tests of Model 1 in Table 1 above also prove that the persistence of non-current operating accruals has a significant positive effect on idiosyncratic volatility in the four-factor model, as indicated by a smaller probability value (0.0000) than the significance value (0.05). This result proves that investors see changes in the calculation of fixed assets, which indicate a change in specific risks to the company in the same direction. These results indicate that the higher the change in the value of non-current operating accruals, the higher the idiosyncratic volatility will be. The results of this study support the results of the study by Asri *et al.* (2017) finding that an increase in investment is related to an increase in future cash flow and has a positive effect on stock expectations when a new investment is announced. The finding of the present study also in line with the results of the study of Miller and Rock (1985), Arena *et al.* (2008), Liow and Dapaah (2010), Shroff *et al.* (2013), and Hui *et al.* (2015) that tested the positive effect of investment on stock expectations. However, the results of this study contradict the research results of Jiang *et al.* (2009) and Berrada and Hugonnier (2013) that found a negative relationship.

Analysis of Model 2

Model 2 in this study tested the significance level by correlating the variables of current operating accrual persistence, non-current operating accrual persistence, and idiosyncratic volatility in the four-factor model on stock prices.

$$\text{Stock Prices} = 8220{,}848 - 116{,}1793\,\Delta CO - 97{,}88845\,\Delta NCO + 219{,}3037 IVOL + e$$

Table 2 - The Significance Test of Model 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8220.848	1747.802	4.703536	0.0000
ΔCO	-116.1793	92.46678	-1.256444	0.2117
ΔNCO	-97.88845	93.83177	-1.043234	0.2992
IVOL	219.3037	91.96293	2.384697	0.0188

Source: Output Eviews, 2019

Based on the results of statistical tests shown in Table 2, the persistence of current operating accruals and the persistence of non-current operating accruals do not have a significant effect on stock prices. It means that investors do not consider changes in current operating accruals on the Indonesia Stock Exchange in the formation of stock prices. The results of this study support the research of Sloan (1996) that the component of cash flow has a better predictive ability for future earnings. This result, however, does not support the research of Lambert *et al.* (2011), Zhu *et al.* (2014), and Asri *et al.* (2017) that the persistence of non-current operating accruals has a positive effect on stock prices.

Statistical tests of Model 1 also prove that idiosyncratic volatility in the four-factor model has a significant effect on stock prices. This indicates that with a high level of idiosyncratic volatility in the four-factor model, stock demands by investors are greater, which leads to higher stock prices. The results of this study support the research of Nartea *et al.* (2011), Chen and Chen (2012), Cotter *et al.* (2015), Herskovic *et al.* (2015), Naomi (2016), and Asri *et al.* (2017) that high idiosyncratic volatility will increase stock prices. Nevertheless, a negative relationship between idiosyncratic volatility with stock prices was found in the research of Xing and Zhang (2008) and Brockman *et al.* (2009).

Intervening Test

Based on data processing using Eviews, the following results are obtained:

Table 3 - Test of X_1 to Y

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8220.848	1747.802	4.703536	0.0000
ΔCO	-116.1793	92.46678	-1.256444	0.2117

Source: Output Eviews 9, 2019

Table 3 shows that the current operating accrual persistence does not have a direct effect on stock prices because the significance value of 0.2117 is greater than 0.05.

Table 4 - Test of X_1 to Z

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.601019	1.047476	-4.392480	0.0000
ΔCO	-0.176180	0.057220	-3.079020	0.0025

Source: Output Eviews 9, 2019

Table 4 shows that the persistence of current operating accruals significantly influences idiosyncratic volatility in the four-factor model.

Table 5 - Test of X_2 to Y

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8220.848	1747.802	4.703536	0.0000
ΔNCO	-97.88845	93.83177	-1.043234	0.2992

Source: Output Eviews 9, 2019

Table 5 shows that the non-current operating accrual persistence has no direct effect on stock prices because the significance value of 0.2992 is greater than 0.05.

Table 6 - Test of X2 to Z

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.601019	1.047476	-4.392480	0.0000
ΔNCO	0.408631	0.061414	6.653712	0.0000

Source: Output Eviews 9, 2019

Furthermore, Table 6 shows that the persistence of non-current operating accruals significantly influences idiosyncratic volatility in the four-factor model. This is indicated by the significance value of 0.000, which is small than 0.05.

Table 7 - Test of Z to Y

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8220.848	1747.802	4.703536	0.0000
IVOL	219.3037	91.96293	2.384697	0.0188

`Source: Output Eviews, 2019

Table 7 confirms that idiosyncratic volatility in the four-factor model significantly influences stock prices. This is indicated by the significance value of 0.0188, which is smaller than 0.05. Based on the description of the regression results above, it can be concluded that idiosyncratic volatility in the four-factor model can fully mediate the influence of the

persistence of current operating accruals and the persistence of non-current operating accruals on stock prices.

CONCLUSION

This study has proven that investors assess the persistence of current operating accruals as changes in current assets and current liabilities that are not conducted with firm-specific risks. An increase in changes in current operating accruals is seen by investors as a decrease in firm-specific risk. It is because investors in the Indonesia Stock Exchange prefer to do short-term trading and the average type of investors in Indonesia is risk-averse; thus, when they see an increase in current assets and current liabilities at manufacturing companies on the Indonesian Stock Exchange, investors will immediately form a portfolio to reduce their investment risk. Conversely, the significant positive effect of the non-current operating accrual persistence on idiosyncratic volatility in the four-factor model shows that investors on the Indonesian Stock Exchange see changes in non-current operating accruals as changes in fixed asset accounts and there are firm-specific risks; an increase in this account also means an increase in risk. This condition occurs because idiosyncratic volatility is influenced by financial policies, company characteristic factors, company funding policies, and company operating activities that short-term accruals have a significant effect on the firm-specific risks.

Furthermore, the test results, showing that the current operating accrual persistence and non-current operating accrual persistence did not affect stock prices, indicate that investors in the Indonesian Stock Exchange do not consider changes in current accruals and non-current accruals as price forming components. The market does not fully use the information on persistence differences of accrual earnings and cash flow in valuing stock prices. Investors behave as if they were fixated on the number of profits reported by the company without further analyzing whether the sources of earnings are persistent or not.

This study succeeded in proving the existence of an indirect effect of idiosyncratic volatility in the four-factor model in the relationship between the persistence of current operating accruals and the persistence of non-current operating accruals on stock prices. The results confirmed that the presentation of reports on changes in current assets and current liabilities of listed companies was seen by investors and capital market analysts as a firm-specific risk so they had a positive impact on stock prices. The results of this study are consistent with the prospect theory that the stock price process is generally formed from risk considerations; in this case, the firm-specific risks are measured by idiosyncratic volatility and become an investor's frame that changes over time.

Finally, this study was also able to prove that there was a significant positive effect of idiosyncratic volatility in the four-factor model on stock prices. Idiosyncratic volatility in the four-factor model reflects specific information about the company and fluctuates according to the information itself. From the perspective of the prospect theory, investors become risk-takers in the loss domain, so the demand for stocks with high idiosyncratic volatility is greater. In equilibrium conditions, rational investor demand is not perfectly elastic so the demand for stocks with high idiosyncratic volatility will be greater that stock prices will be higher.

REFERENCES

1. Ang, A., Hodrick,R., Xing,Y., & Zang, X. (2006). The Cross-section of volatility and expected returns. Journal of Finance, 61, 259-299.
2. Bali, T. G., & Cakiki, N. (2006). Idiosyncratic Volatility and the Cross-Section of Expected Returns. Working papers, City University of New York.
3. Boyer, B., Mitton, T., & Vorkink, K, (2007). Idiosyncratic volatility and skewness: time series relations and the cross-section of expected returns (Unpublished Thesis). Brigham Young University, USA.

4. Brockman, P., & Schutte, M. (2007). Is idiosyncratic volatility priced? The international evidence (Unpublished Thesis). University of Missouri, Columbia.
5. Carhart, M. (1997). On persistence in mutual fund performance. Journal of Finance, 52, 54–82.
6. Dechow, P., & Dichev, L. D. (2002). The Quality of Accruals and Earnings: the Role of Accrual Estimation Errors. The Accounting Review, 77, 35--59.
7. Dechow, P., Ge, W., & Schrand, C. (2010). Understanding Earning Quality: Areview of the proxies, their determinants and their consequences. Journal of Accounting and Economics, 50(2-3), 344-401.
8. Durnev, A., Li, T., & Magnan, M. (2016). Are offshore firms worth more? Journal of corporate finance, 36, 131-156.
9. Durnev, A., Morck, R., Yeung, B., & Zarowin, P. (2003). Does Greater Firm-Specific Return Variation Mean More or Less Informed Stock Pricing? Journal of Accounting Research, 41(5).
10. Frankel, R., & Litov, L. (2009). Earnings volatility and earnings predictability. Journal of Accounting and Economics, 47(1-2), 182-190.
11. Fu, F. (2009). Idiosyncratic risk and the cross-section of expected stock returns. Journal of Financial Economic. 91, 24-37.
12. Harvey, C., & Siddique, A. (2000). Conditional Skewness in asset pricing test. Journal of Finance, 55, 1263-1295.
13. Huang, W., Liu, Q., Rhee, G., & Zhang, L. (2007). Another look at idiosyncratic risk and expected returns (Unpublished working paper). University of Hawaii, Manoa.
14. Jiang, G. J., Xu, D., & Yao, T. (2009). The information Content of Idiosyncratic Volatility. Journal of Financial and Quantitative Analysis, 44(01), 1-28.
15. Kahneman, D., & Amos, T. (1979). Prospect Theory: An Analysis of Decision Under Risk. Econometrica, 47, 263-291.
16. Lambert, R. A., Leuz, C., & Verrecchia, E. (2011). Information Asymmetry, Information Precision , and the Cost of Capital. Review of Finance, 1–29.
17. Levy, H. (1978). Equilibrium in an imperfect market: a constraint on the number of securities in the portfolio. American Economic Review, 68, 643-658.
18. Malkiel, B. G., & Yexiao, X. (2004). Idiosyncratic Risk and Security Returns. Working Papers. The Annual Meetings of the American Finance Association.
19. Marselinus, A. A. H. (2017). Persistensi Akrual dan Harga Saham-Studi pada Perusahaan Manufaktur di Bursa Efek Indonesia (Unpublished Thesis). Hasanuddin University, Indonesia.
20. Merton, R. (1987). A Simple model of capital market equilibrium with incomplete information. Journal of Finance, 42, 438-510.
21. Myers, S. C. (1977). Determinants Of Corporate Borrowing. Journal of Financial Economics, 5, 147–175.
22. Rahmawati. (2014). Pengaruh Penghindaran Pajak dan Good Corporate Governance Terhadap Biaya Utang. Jurnal Akuntansi, 3(1).
23. Richardson, S., Sloan, R., Soliman, M. T., & Tuna, I. (2005). Accrual Reliability, Earning Persistence, and Stock Prices. Journal of Accountingand Economics, 39, 437-485.
24. Roll, R., & Subrahmanyam, A. (2010). Liquidity skewness. Journal of Banking and Finance, 34(10), 2562–2571.
25. Sloan, R. G. (1996). Do Stock Prices Fully Reflect Information in Accruals and Cash Flow Anout Future Earnings? The Accoounting Review, 71(3), 289-315.
26. Spiegel, M., & Xiaotong, W. (2006). Cross Sectional variation in Stock Returns: Liquidity and Idiosyncratic Risk. Working Papers, Yale University
27. Zhu, P., Jog, V., & Otchere, I. (2014). Idiosyncratic volatility and mergers and acquisitions in emerging markets. Emerging Markets Review, 19, 18–48.