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ASYMMETRIC INFORMATION AND FIRM VALUE DURING PANDEMIC COVID-19

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Abstract

The purpose of this study is to investigate the relationship between fundamental factors, asymmetric information, and firm value during the 2020 pandemic by taking samples of 457 non-financial companies listed on the Indonesian Stock Exchange. Two-stage least square testing by controlling the firm's and industrial characteristics proves that asymmetric information does not have a dominant role in explaining firm value changes during the COVID-19 pandemic. This study also confirms that (1) the disclosure of information through corporate financial reports and foreign investors' presence still has a dominant role in mitigating information gaps among traders; (2) foreign investors' trading behavior indirectly provides information through their shares' trading flow, which causes a decrease in asymmetric information. This comprehensive empirical testing provides additional evidence regarding asymmetric information and firm value in developing markets during the pandemic.

Keywords: *Asymmetric information, firm value, firm characteristics, pandemic, COVID-19, emerging markets.*

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1. INTRODUCTION

Economic and financial uncertainty during the pandemic period has become an important issue, especially regarding firm shares valuation. Investors who should be rational in designing trading strategies based on expectations of the firm's future cash flows can act irrationally in stock trading because of uncertainty, especially news related to disease (Donadelli et al., 2017). Stock trading is triggered by sentiment, which is the dominant determinant of variation in the firm value (Ahmed, 2020). Recent empirical evidence (Al-Awadhi et al., 2020) suggests that the COVID-19 pandemic harms corporate stock returns.

Under normal conditions, firms' valuation uncertainty can be caused by information asymmetry (Jindra and Moeller, 2020). This problem arises because there are informed traders who can benefit from this private information. Several previous studies document the impact of asymmetric information on changes in firm value. Information asymmetry was found to harm firm value in the UK (Fosu et al., 2016) and in Vietnam (Huynh et al., 2020). However, there is no consensus regarding the impact of asymmetric information on firm value, especially during the pandemic. Information gaps between traders can also cause stocks to be considered too expensive (Miller, 1987).

This study discusses the relationship of asymmetric information on firm value changes in developing countries by considering several firm’s characteristics. This study takes the object of companies in Indonesia, considering that this country tends to have a higher vulnerability than other Asian stock markets. Indonesia is a country that is considered to have economic instability and exposure, especially during the Asian and global financial crises (Thampanya et al., 2020). Shares in developing companies also tend to be disproportionately sensitive to broad investor sentiment (Baker and Wurgler, 2007).

There are at least three significant contributions of this study to literature. *First*, this study adds to the literature by expanding the research area in the emerging markets during a pandemic. *Second*, this study documents empirical evidence of the association between firm characteristics, asymmetric information, and firm value. *Third*, this study provides an additional illustration indirectly related to the rational and irrational behavior of investors in shaping the price of equity in companies.

The rest of this article is divided into several parts. The second part reviews the literature and theoretical concepts that underlie the examination of asymmetric information and firm value changes. The third part describes the data and the estimation model. The fourth section

contains the analysis of test results. The fifth section presents a discussion of the results. Finally, the sixth section concludes the results of this study.

2. LITERATURE REVIEW

The presence of information related to economics and finance on the capital market as a whole will be an indicator for traders in determining a fair price for firm equity. At least two types of information can affect stock prices, namely public information and private information (French and Roll, 1986). Public information can be known simultaneously by all traders, who can then influence stock prices. In contrast, private information is only owned by informed traders.

Private information has become an important issue in determining share prices among traders in the capital market, and this problem has been documented for half a century ago (Bagehot, 1971). The presence of this problem causes some parties to benefit from private information and not for other parties. In this case, there is an adverse selection of informed and uninformed traders because more informed traders in the capital market can affect price formation (Bagehot, 1971). This argument becomes logical because market participants closely related to the firm will have better information about the firm and then trade it.

Information gaps between traders indicate a problem with asymmetric information. This problem then becomes the cause of errors in the formation of equity prices in each firm. Empirical evidence at the initial public offering shows that companies' uncertainty of valuation is due to information asymmetry (Jindra and Moeller, 2020). In this case, price volatility can be due to price errors during trading (French and Roll, 1986). In experimental laboratory testing, it has also been shown that informed players will make adjustments to their strategy when historical information is obtained so that an informed trader will buy or sell shares at the time of releasing private information (Wen, 2018). Information asymmetry was found to have a negative impact on firm value (Fosu et al., 2016; Huynh et al., 2020), but it can also be the cause of stock prices being overvalued (Miller, 1987). The overall description regarding asymmetric information shows that the existence of information gaps among traders can be a cause of mistake in determining a fair price for firm equity. Asymmetric information, on the one hand, can cause the firm to be less valuable. Still, on the other hand, it can also be the cause of an overvaluation of the firm's stock price. Considering pandemic conditions with high uncertainty, this study draws the following first hypothesis: Asymmetric information cannot predict changes in value at the firm during a pandemic.

To mitigate the problem of asymmetric information, companies can make voluntary disclosures that contain firm-specific information. This voluntary disclosure has a positive effect on the quality of information because it reduces asymmetric information, and investors can respond to this disclosure (Nugroho et al., 2015). Market traders perceive good quality as a result of increased positive perceptions of the firm. This disclosure can then positively affect firm value (Uyar and Kiliç, 2012). If asymmetric information is reflected in the bid-ask spread, which shows differences in information between informed and uninformed traders (Bagehot, 1971), empirical evidence also indicates that the disclosure of information has a close association with the bid-ask spread (Healy and Palepu, 2001).

The question that then arises is, what information can reduce information inequality? In normal economic and financial conditions, fundamental information plays an important role in the quality of information. Fundamental factors play an essential role in influencing stock market volatility in Malaysia, Thailand, and Singapore (Thampanya et al., 2020). In some of the literature, this fundamental indicator is viewed in terms of leverage (Chong and Kim, 2018; Huang et al., 2018; Huynh et al., 2020) and profitability (Harris, 2016). Although it has limited capabilities, leverage is still considered important in reducing asymmetric information in developing countries in Vietnam (Huynh et al., 2020). The volatility of the capital structure, in this case, represents a price puzzle in the stock market (Chong and Kim, 2018). The short-term debt component can substitute for corporate governance because of a disciplinary role in management (Huang et al., 2018). Information related to earnings also has an important role related to asymmetric information. Earning announcements can reduce asymmetric information between informed traders and market markers (Harris, 2016).

Apart from public disclosure of information, there is still private information that market players cannot fully capture. Traders who are not informed in this regard can capture information through changing foreign investment flows. Previous empirical evidence (Wang, 2014) shows that foreign parties' investment has a strong impact because these parties have an advantage in terms of information. Foreign institutional investors are also more sophisticated investors because they are the first to understand news announcements' information content, and these investors act quickly on negative events (Booth et al., 2011). Foreign investors have a higher impact on stock volatility (Al-Awadhi et al., 2020).

Foreign investors have an essential role in changing the quality of information on the emerging markets, especially during the pandemic period, with some logic. *First,* investor

sentiment can influence investment decisions and stock price valuations (Ichev and Marinč, 2018). *Second*, the consideration that foreign parties control companies in Indonesia shows an increase (Setiawan et al., 2016). *Third*, the consideration of returns is negatively affected by the deteriorating financial market conditions (Chong and Kim, 2018). Shares trading triggered by sentiment is an essential determinant of stock price variations (Ahmed, 2020). Shares in developing companies will be disproportionately sensitive to broad investor sentiment (Baker and Wurgler, 2007).

Based on the overall logic, the hypothesis related to the delivery of fundamental information related to the firm and information extracted from foreign investors' trading patterns in relation to asymmetric information is: Fundamental firm information and foreign investor trading can mitigate asymmetric information.

3. RESEARCH METHOD

3.1. Data

Testing on all non-financial companies on the Indonesia Stock Exchange (IDX). Financial firms are not used because companies with these industries have different financial and regulatory characteristics. Non-financial companies are used as samples with data availability considerations. The final sample used was 457 non-financial companies. The data used in this study are the financial statements of the end of 2019, published in 2020, to investigate asymmetric information and investor reactions during the COVID-19 pandemic. Data on stock prices, bid-ask spread, and market size are determined precisely based on the release of financial reports of each firm in the IDX in 2020.

3.2. Firm Value

The dependent variable in this study is firm value as measured by Tobin's Q. The use of this indicator takes into account the wide use of this ratio in previous studies (for example (Fosu et al., 2016; Huynh et al., 2020; Wang and Zhao, 2020)). To ensure robust test results, firm value is also proxied by different indicators, namely the market to book value (MBV) (Miller, 1994; Siagian et al., 2013). The determination of stock prices in this study is carried out carefully and thoroughly by considering the day and time of submission of financial information on the IDX website. Suppose the issuance of financial statements occurs during or after the end of trading hours for shares at IDX. In that case, the share price determination is determined based on the following trading day. This determination ensures that traders have known financial information and reflect it on each firm's bid-ask spread and stock price.

3.3. Asymmetric Information

Asymmetric information is an endogenous variable in this study. Referring to the microstructure theory, asymmetric information is reflected in the bid-ask spread (Bagehot, 1971; Copeland and Galai, 1983; Glosten, 1987; Glosten and Milgrom, 1985). The use of the bid-ask spread with the consideration that some parties have private information and not others. The presence of a superiorly informed trader leads to a positive bid-ask spread (Glosten and Milgrom, 1985).

3.4. Instrumental Variables

Fundamental factors in the financial reports and trading patterns of foreign investors are instrumental variables in this study. Fundamental information with consideration of leverage (Chong and Kim, 2018; Huang et al., 2018; Huynh et al., 2020) and firm business sustainability with profitability indicators (Ng and Rezaee, 2020). Given private information, this study uses the foreign investor trading indicator, which is proxied by selling trading volume. The consideration of using this indicator in the investigation of this study is by considering this investor's sophistication in understanding the information content (Booth et al., 2011).

3.5. Control Variables

Asymmetric information investigations on changes in firm value are carried out by involving control variables. A study that considers the firm's size and age reflects its characteristics, which in some literature is deemed an essential role in firm value. Firm size is positively related to firm value (Siagian et al., 2013) because it has a higher reputation and a lower risk of bankruptcy (Chen and Chen, 2011). Potential investors consider firm size as an indicator of reputation (Yasser and Mamun, 2015). Apart from size, the firm's age also has a bearing on the value of the firm. Young companies will have a larger beta than usual due to a lack of familiarity (Chincarini et al., 2020). Companies with lower market capitalization and younger age will have an extreme sensitivity to investor sentiment (Baker and Wurgler, 2007).

Testing is also carried out by considering the effect of the industry on each firm (Dhochak and Sharma, 2015). This consideration is relevant, considering that testing was carried out during a pandemic. This argument is confirmed in previous literature on SARS (Chen et al., 2007) and the Ebola outbreak (Ichev and Marinč, 2018). Certain sectors have performed well during the pandemic but not other sectors (Al-Awadhi et al., 2020).

3.6. Research Model

Testing with two-stages least squares to consider the issue of endogeneity in the regression model. The test is carried out with the following models:

$$SPREAD_{i,t} = \beta_0 + \beta_1 SPREAD_{i,t-1} + \beta_2 PROFIT_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 FOREIGN_{i,t-1} + \varepsilon_{i,t}$$

$$FV_{i,t} = \beta_0 + \beta_1 FV_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 AGE_{i,t-1} + \beta_4 SPREAD_{i,t} + \varepsilon_{i,t}$$

where FV refers to the value of the firm as measured by Tobin's Q and MBV, with the control variables market size (SIZE) and firm age (AGE). Tobin's Q is measured based on the sum of the market value of equity and book value of debt, then compared with the book value of total assets. MBV is obtained by comparing the share price with the book value per share. SIZE is determined based on the price and number of shares outstanding. AGE is determined based on the length of time since the firm is registered to IDX. This firm age measurement is based on its testing on the value of public companies in Indonesia.

The endogenous variable is asymmetric information (SPREAD), which is proxied by the bid-ask spread measured by the difference between the ask and the bid price, which is then divided by the average ask and bid price (Glosten, 1987; Harris, 2016). Instrumental variables, namely the firm's fundamental factors (profitability and leverage) and foreign sell. Profitability (PROFIT) is determined based on comparing net profit after tax with the firm's total assets. Leverage (LEV) is measured by comparing total debt to total assets (Fosu et al., 2016). Foreign sell (FOREIGN) is based on the natural logarithm of sales trading volume by foreign parties.

4. ANALYSIS

Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Q1	Q2	Q3
MBV_t	0.6721	105.0953	-1769.9640	1372.0360	0.3922	0.7773	1.5969
Q_t	6.4026	72.9426	0.1170	1114.4000	0.7195	0.9176	1.4455
$Spread_t$	0.6149	0.9606	-2.0000	2.0000	0.0080	0.0375	2.0000
Size	27.6816	1.8805	22.9205	34.3464	26.3021	27.6236	28.8622
Age	15.4273	10.8289	1.0568	69.9959	6.0342	13.6181	25.2430
Profit	-0.0015	0.3042	-4.7987	0.6070	-0.0067	0.0196	0.0586
Lev	2.8376	45.7497	0.0018	973.4065	0.2780	0.4614	0.6321
Foreign	4.0568	6.1243	0.0000	18.4555	0.0000	0.0000	10.5160

Tables 1 and 2 provide descriptive information on all variables in this study. Table 2 shows correlation analysis in the variable which is used in the estimation model in research. Pearson Correlation Testing results are a significant level of 5%. The results show that firm value measured by MBV and Tobins' Q has a significant associations of 0.4346. These results indicate that these two proxies have the same meaning in reflecting firm value. There is a strong correlation founded in instrumental and control variables. To ensure that multicollinearity problems do not occur, all test models are tested using the variance inflation factor (VIF). The test results show that all models in this research produce a VIF value of less than 5, which means it is no multicollinearity problems.

Table 2. Correlation Matrix

	MBV_t	Q_t	$Spread_t$	Size	Age	Profit	Lev	Foreign
MBV_t	1							
Q_t	0.4346*	1						
$Spread_t$	0.0650	0.0652	1					
Size	0.0394	0.1292*	-0.2032*	1				
Age	0.0102	-0.0511	-0.0398	0.0431	1			
Profit	0.0061	0.0082	-0.0966*	0.2221*	0.0279	1		
Lev	-0.0007	0.6999*	-0.0177	0.0072	-0.0088	0.0019	1	
Foreign	-0.0410	-0.0463	-0.2888*	0.5363*	0.0523	0.1221*	-0.0343	1

Table 3 presents the test results for all non-financial companies in Indonesia that have published financial reports since January 2020. This test is carried out as an initial step to detect changes in information quality and firm value due to disclosure of information through financial reports. The argument for conducting testing in this period is considering that COVID-19 has started at the end of 2019.The test was carried out with two models, namely OLS, by controlling the standard error and 2SLS. The whole test was carried out by considering the industry effect with the logic that the COVID-19 pandemic will have a different impact on each industry. The whole test was carried out with a lag on each dependent variable with the consideration of heterogeneity.

Table 3. Full Model Results

Variables	$Spread_t$	MBV_t	Q_t
$Spread_{t-1}$	0.6522***		
	(0.0445)		
MBV_{t-1}		0.9577***	
		(0.0056)	
Q_{t-1}			0.9945***
			(0.0032)
$Spread_t$		1.1043	0.2889
		(0.9884)	(0.2670)
Profit	-0.3536*		
	(0.2115)		
Lev	-0.0229**		
	(0.0113)		
Foreign	-0.0216***		
	(0.0061)		
Size		0.7832**	0.1652*
		(0.3528)	(0.0974)
Age		-0.0431	-0.0099
		(0.0596)	(0.0161)
Constant	0.3457***	-23.7369**	-5.1531*
	(0.0827)	(10.0084)	(2.7592)
Kleibergen-Paaprk LM Statistics (p-value)		0.0000	0.0000
Cragg-Donald Wald F Statistics		86.1630	86.9010
Hansen J Statistics (p-value)		0.9833	0.9285
Endogeneity test(p-value)		0.0272	0.0083
Hettest (p-value)		0.5503	0.9192
Industry Effect	Yes	Yes	Yes
R-squared	0.4914	0.9860	0.9959

Note: The values in parentheses after presenting the coefficients are robust standard errors. The significance level uses the eccentric symbols ***, **, and *, which are equal to the significance levels of 0.01, 0.05, and 0.1, respectively.

Post-test estimation for 2SLS is done with the under-identification test (Kleibergen-Paaprk LM Statistics), weak identification test (Cragg-Donald Wald F Statistics), overidentification test (Hansen J Statistics), and endogeneity test. The under-identification test results show that the overall p-value is 0.000, while the overidentification test is 0.9833 and 0.9285. Weak identification test results were shown with the values of 86.1630 and 86.9010. The tests showed that there were no under-identification, overidentification, and weak identification problems. The endogeneity test shows the p-value of 0.0272 and 0.0083, which

shows that asymmetric information is an endogenous variable. All test results show that the homoscedastic assumption has been fulfilled, indicated by the p-value in the heteroscedasticity test 0.5503 and 0.9192.

The testing on the first equation of this research shows that the firm's asymmetric information on the previous day has a significant role in explaining asymmetric information on the next trading day, which is indicated by a significant coefficient of 0.6522 at the 0.01 level. The presentation of the firm's financial performance in this research is represented by profitability and leverage. The test results for the association of profitability and bid-ask spread are -0.3536, significant at the 0.1 level. Furthermore, the directional coefficient on leverage is -0.0229, significant at the 0.05 levels. These results indicate that the release of public information in submitting financial reports will reduce asymmetric information. Private information that appears on the release of information by foreign parties also has a role in lowering asymmetric information on non-financial firms in Indonesia during the pandemic period (β= -0.0216; SE= 0.0061).

The second equation test shows that the firm's value with the MBV_{t-1} and Q_{t-1} indicators has a coefficient of 0.9577 and 0.9945, all significant at the 0.01 level. These results indicate that the firm's value on the previous trading day can explain its value changes the following day. Furthermore, the firms' characteristics with the market size indicator have a coefficient of 0.7832 on the MBV, while its association with the Tobins Q indicator is shown by a direction coefficient of 0.1652. The market size association with the MBV and Tobin's Q indicator values is significant at the 0.05 and 0.1 levels, which means the larger the firm's market size, the more likely it is to have a higher firm value. Furthermore, age and asymmetric information on firms did not significantly impact the firm's value during the COVID-19 pandemic. All test results support the hypothesis in this study.

To ensure consistency of test results, Table 4 restates the test results in this study in a sub-sample of companies with published financial reports on the Indonesia Stock Exchange as of March 2, 2020. The use of this data is based on the announcement of the first COVID-19 case in Indonesia. Tests with OLS regression modeling, the results still show consistency, as shown in Table 3 that disclosure of financial information that appears on profitability and leverage has a role in minimizing information inequality. Trading by foreign parties at the time of releasing financial information also has a role in reducing asymmetric information.

Table 4. Robustness Checks

Variables	$Spread_t$	MBV_t	Q_t
$Spread_{t-1}$	0.6522***		
	(0.0445)		
MBV_{t-1}		0.9577***	
		(0.0056)	
Q_{t-1}			0.9945***
			(0.0032)
$Spread_t$		1.1027	0.2884
		(0.9894)	(0.2672)
Profit	-0.3572*		
	(0.2151)		
Lev	-0.0231**		
	(0.0115)		
Foreign	-0.0217***		
	(0.0061)		
Size		0.7851**	0.1656*
		(0.3542)	(0.0978)
Age		-0.0427	-0.0098
		(0.0599)	(0.0162)
Constant	0.3462***	-23.7946**	-5.1672*
	(0.0828)	(10.0527)	(2.7715)
Kleibergen-Paaprk LM Statistics (p-value)		0.0000	0.0000
Cragg-Donald Wald F Statistics		85.9810	86.7220
Hansen J Statistics (p-value)		0.9830	0.9271
Endogeneity test(p-value)		0.0275	0.0084
Hettest (p-value)		0.5523	0.9197
Industry Effect	Yes	Yes	Yes
R-squared	0.4910	0.9860	0.9959

Note: The values in parentheses after presenting the coefficients are robust standard errors. The significance level uses the eccentric symbols ***, **, and *, which are equal to the significance levels of 0.01, 0.05, and 0.1, respectively.

The post-estimation on the 2SLS test on the firm value with the MBV indicator shows the under-identification test and the overidentification test, respectively, showing a p-value of 0.0000 and 0.9830. Furthermore, testing the firm value with the Tobins Q indicator shows the p-value of 0.0000 and 0.9271, respectively. The overall test results indicate that there are no under-identification and overidentification problems in this sub-sample test. The overall results also showed no heteroscedasticity and weak identification problems in this test.

The 2SLS test also shows the consistency of the results shown in the previous Table 3, namely that firm characteristics with firm size indicators are the best predictors of explaining changes in firm value in Indonesia during the pandemic period. The irrational behavior of traders during the COVID-19 pandemic is indicated by the absence of the impact of information gaps among traders on changes in the value of companies in Indonesia.

5. DISCUSSION

The initial test in this research investigates the role of public information and the flow of foreign information on the bid-ask spread. The test results on the entire sample and categorization into the sub-sample by considering when the first case of COVID-19 was detected in Indonesia shows that the delivery of public information through the publication of financial reports to the public can narrow the bid-ask spread, which means suppressing asymmetric information. Information related to the firm's ability to generate profits can reduce the information gap among traders in obtaining an overview of management performance in managing firm finances.

Information regarding firm leverage also narrows the bid-ask spread. The use of debt greater than other firms in similar industries can cause higher financial risk. However, the debt component can serve as a substitute for corporate governance because of a disciplinary role in management (Huang et al., 2018). The results of this test support a number of previous studies (Chong and Kim, 2018; Harris, 2016; Huynh et al., 2020), which state the vital role of debt in mitigating asymmetric information.

The trading behavior of foreign investors, which in some literature is considered a sophisticated type of trader (Booth et al., 2011), is also proven in this research. The test results confirm a negative association of share sales transactions by foreign investors on asymmetric information. This evidence is an early indication that uninformed parties can extract private information from sales flows by foreign parties.

Subsequent empirical evidence in this research shows that although there is a positive coefficient on asymmetric information testing on firm value, this association is not significant. Asymmetric information cannot be a predictor that explains changes in Indonesia's firm value during the COVID-19 pandemic. The characteristics of the firm's shares, with market size indicator, become investors' consideration in determining firm value. These results confirm previous findings (Baker and Wurgler, 2007; Chen and Chen, 2011; Siagian et al., 2013).

6. CONCLUSION

This study sheds light related to asymmetric information associations in firm value changes during the COVID-19 pandemic. The analysis is done by considering the firm's fundamental information and foreign's trading patterns in developing countries by taking samples from Indonesia. This research can be used as a reference for future research during pandemics and financial crises in developing countries.

This research indicates that public information conveyed through financial reports will reduce the information gap between traders. Private information that appears on foreign investors' trading flows also has a negative association with asymmetric information. However, asymmetric information during a pandemic has no role in explaining changes in firm value. Big firms are considered to have the ability to withstand pandemic and high uncertainty conditions, so firms with large market capitalizations have higher ratings by traders compared to smaller firms. This research confirms the trader's familiarity with big firms in developing countries.

An important implication of this study from a practical perspective is the emphasis on disclosing information to the public. Even though there was no role for financial information in shaping firm value during the pandemic, firms still need to ensure the quality of financial information to minimize information gaps among traders. Firms have difficulty gaining the trust of stakeholders and investors if there is imperfect information regarding the firm's performance and financial structure.

Even though this research has used all registered non-financial companies in Indonesia, the test, which is confirmed to be free from endogeneity issue, has controlled the industrial effect, controlling firm characteristics, and divide the tests into sub-sample testing, this research has its limitations. The analysis in future research could use objects expansion in other developing countries. Expansion in subsequent research can also be done on asymmetric information indicators.

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