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Financial Signaling and Stock Return Movements: New Evidences in Indonesian Stock Markets after Covid-19

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Abstract

Economic and business uncertainty following Covid-19 resulted in more volatile returns in Indonesian stock market, a situation that requires investors to more carefully assess what financial signals drive returns. This allows them to select the right shares into their portfolio. To help investors overcome the problem, we specify a logit model that links stock returns with several financial signals including profitability, leverage, activity, market multiple and dividend policy, using data 661 non-financial firms listed on the Indonesia Stock Exchange. The statistical results are compared with investor opinions obtained from a Focus Group Discussion. We found surprising facts in Indonesian equity market that signals observed in previous studies influence stock returns, most of them have insignificant coefficients in this study. However, there are three signals that significantly affect stock returns, consisting of two profitability signals, return on assets and earnings per-share, with a positive coefficient and one leverage signal, debt to equity, with a negative coefficient. we then examine our results deeply by considering firm size, shariah and industry classification, three characteristics of the Indonesian stock market. Size is important due to the strong effect of profitability on stock returns for large firms and that stock returns move in the opposite direction with leverage for small size firms, describing higher risks for small firms. Earning per-share is significant for sharia group data, reflecting sharia investors prefer real returns on their investments but tend to ignore debt. Finally, our results are not influenced by industry classification.

Keywords: *Financial Signal, Logit, Stock Return, Shariah.*

Introduction

Rational investors in the stock market generally want to get a satisfactory return on their capital invested, but it is not easy to achieve this due to uncertain return movements. Efforts to predict stock returns continue to occur using quite sophisticated models, for example the CAPM (Sharpe, 1964), APT (Ross, 1976), and the three-factor model (Fama & French, 1992), but the movement of stock returns remains a critical issue.

Stock prices or returns usually react to each factor as a signal, such as profitability, leverage, activity, market multiple, and dividends. Profitability which is used to assess results has a positive relationship with stock returns because profits reflect good company performance (Fama & French, 2015; Fathony, et al., 2020; Endri, et al., 2019). Investors react negatively to leverage because high leverage reflects high financial risk and the inability to generate sufficient internal funds (Myers & Majluf, 1984; Miller & Rock, 1985). Investors react positively to operating efficiency and asset turnover because both can increase profits. A low market multiple or P/E and an increase in dividend payout ratio indicate promising profits and are responded positively by investors. Do these signals have power in driving stock returns in Indonesia's emerging equity market? An empirical study using representative data is urgently needed.

Panic caused by the unexpected presence of the Covid-19 pandemic almost paralyzed the world economy as reflected in very volatile stock prices or returns (Baker, et al., 2020; Phan & Narayan, 2020). The economic and business environment is changing and becoming increasingly uncertain after covid-19 (the economist, 2022). In this new environment, the type and magnitude of factors may have changed, so investors must reassess the factors or financial signals that can drive stock returns and use them to make

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investment decisions, otherwise they will experience losses. This study helps investors to solve this problem by analyzing the effect of several financial signals, such as profitability, leverage, activity, market multiple, and dividend policy on stock returns, using data from 661 non-financial firms listed on the Indonesia Stock Exchange. Using a lot of data allows us to reveal convincingly new facts about financial signals that correlate with stock returns in Indonesia's emerging equity markets after the Covid-19 pandemic. Analysis of Indonesian company data allows us to compare our results with theory and the results of previous studies.

We found surprising facts in Indonesian equity market where the variables considered important in previous studies to influence stock returns, most of them have insignificant coefficients in this study. However, only three variables significantly affect stock returns, they are returns on assets and earnings per share (positive coefficients) as proxies for profitability and debt to equity (negative coefficients) as proxies for leverage. Size is important due to the strong effect of profitability on stock returns for large firms, while in small size firms, stock returns move in the opposite direction with leverage, describing the high risk of small firms. Our results support the sharia effect, as indicated by significant earnings per share coefficient on sharia group data, reflecting sharia investors prefer real returns on their investments but they ignore to consider debt. In contrast, for non-sharia firms, the coefficient of earnings per share is positive but debt to equity is negative, both are significant only at the 15% level. Finally, sector or industry classification do not change our results.

The next section of this paper contains a literature review followed by a research design. We place our results and discussion in section four and conclusion at the end of the paper.

Literature Review

Some economists conclude that stock prices move following a random walk, where current movements do not indicate anything about future movement patterns (Kendall & Hill, 1953; Samuelson, 1965, 1998). However, fundamental analysts try to predict changes in stock prices based on a company's financial performance. Because traders compete with each other using fundamental analysis, prices already reflect most of the relevant information, so future prices are not related to fundamental variables (Brealey, et al., 2011).

The efficient market hypothesis in semi-strong form as explained above is an interesting issue to prove and empirical studies are designed to test the ability of indicators to predict stock prices or returns. In this context, Ou & Penman (1989) show that fundamental signals such as profitability, leverage, activity, and market-based indicators have the power to predict stock returns, enabling investors to obtain abnormal returns through fundamental analysis.

Current profitability indicates ability a company have to generate profits from business, so a positive earnings trend implies an increasingly better ability to obtain future cash flows. In addition, high profits increase dividends and capital gains, which encourage investors to buy shares. The more investors buy shares, the higher the share price and of course the return for investors. In a situation where company faces limited funds, increasing leverage increases financial risk, so that increasing external debt gives a signal that the company is in financial difficulty and is unable to generate sufficient internal funds (Myers & Majluf, 1984; Miller & Rock, 1985). Gross margin and asset turnover describe operating activities related to profit generation (Piotroski, 2000). Increasing margins indicate a decrease in inventory costs or an increase in product prices. An increase in asset turnover signals greater asset productivity, arising from more efficient operations (fewer assets produce the same level of sales) or increased sales (which can also signal improved market conditions for a company's products). The market multiple effect on stock returns is indicated by low P/E, because P/E information is not 'fully reflected' in security prices as quickly as postulated by the semi-strong form of the efficient market hypothesis (Basu, 1977).

Several experts design studies to accurately predict stock returns based on fundamental signals with varying results.

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Piotroski (2000) uses three company financial conditions as fundamental signals, namely profitability (measured by ROA, ΔROA, CFO, and ACCRUAL), financial leverage/liquidity (measured by ΔLEVER, ΔLIQUID, and EQOFFER), and operating efficiency (measured by Δgross margin/total sales and Δsales/total assets), to form the predictive power of FSCORE. For each signal, FSCORE is 1 if the current signal is better than the previous year. Each FSCORE signal is combined and then regressed against stock returns. He found a significant relationship between FSCORE and stock returns, and the predictive power of each signal was quite varied in determining stock prices. The significant positive influence of aggregate signals on stock returns was also observed in Egyptian market by Mahmoud & Sakr (2012) and in Indian market by Venkates, et al. (2012). However, Iqbal, et al. (2013) found an insignificant relationship between FSCORE and stock returns in non-financial company data on Karachi Stock Exchange.

Cross-sectional studies that examine the influence of fundamental signals on stock returns, analyze data in different periods with varying partial results (Arista, 2012; Anisa, 2015; Novitasari, 2017; Bintara, 2019; Fathony, 2020).

Campanella, et al. (2015), when using the abnormal returns of 1,708 manufacturing and service companies in Europe, found that return on equity, debt to equity and earnings per share have a positive and significant effect while market multiple has a negative and significant effect. The weak effect of P/E on stock returns is insignificant (Anisa, 2015; Novitasari, 2017).

The predictive power of fundamental factors was also analyzed using a panel data regression. For example, Shakeel & Gohar (2018) used data on 115 non-financial companies on the Karachi Stock Exchange (KSE) over an 11 year data period (from 2007-2017). Based on random effect model, return on assets, earnings per share and market multiple have positive and significant coefficients, the current ratio is negative and not significant, and debt to assets is positive and not significant, indicating predictive power of fundamental analysis. These results are supported by Endri, et al. (2019) in Indonesia.

The information content of dividends is also tested for its relevance to stock prices or returns. Following the logic of Fama, et al. (1969) and Ross (1977), dividends serve as a message from management that the company will do better, so that the announcement of an increase in dividends will be followed by an increase in stock prices. This fact seems to be proven in developed countries (Asquith & Mullins, 1983; Richardson, et al., 1986). However, studies in emerging markets show two different results, where significant positive effects were observed in the Bahrain capital market (Sharif, et al., 2015), in Indonesia (Irton, 2020), and in India (Sharma & Irfan, 2015), while the negative influence is significant in Nigeria (Benson, et al., 2019).

The movement of stock returns that are not fully predictable and the uncertainty in the economy and business after Covid-19 requires more in-depth study. Apart from that, the condition of the Indonesian capital market where there are many sharia shares will provide some knowledge about price movements and stock returns.

Research Methods

Variable Definition

This study tests whether financial signals (as independent variables) such as profitability, leverage, activity, market multiple and dividend policy are factors that trigger stock return movements (as dependent variables). Table 1 shows each research variable and its measures.

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Table 1. Research Variables and its Measures

No	Variable	Definition	Measure
1	Stock return (Y)	Gain on stock investment, defined as the ratio of current price to previous price.	Stock Return or R = P_1/P_0 R is binary: 1 if R > median R 0 if R < median R
2	Profitability	The firm's ability to earn profits relative to assets, to equity and per-shares.	ROA = Net Income/Assets ROE = Net Income/Equity EPS = Earnings/share EPS is binary: 1 if Eps > median Eps 0 if Eps < median Eps
3	Leverage	Financing a company with debt or amount of debt in company's capital.	D/E = Debt to Equity D/A = Debt to Assets
4	Aktivity	Efficiency in operating a business or effectiveness in managing assets.	S/A = Sales to Aset EBT/S = Earnings Before Tax to Sales NPM = Net Income to Sales
5	Market Multiple	Ratio of share price to earnings.	P/E = Share Price to Eps
6	Dividends	The portion of profits distributed to stockholders.	Dividend or Div Div is binary: 1 if dividend is distributed 0 if dividends is not distributed

Sample

There are 808 companies issuing shares on the Indonesian Stock Exchange in December 2022. Several criteria are applied to obtain a sample from which quality data is derived. We excluded 103 financial companies from our sample because of differences in accounting practices which resulted in their financial statements being incompatible with those of non-financial companies. These financial companies include banks, consumer finance, Investment Banking & Brokerage Services, General Insurance, Life Insurance, Financial Holdings, and Investment Companies. Enterprises experiencing negative equity whose shares are not actively traded are not considered as a sample. Finally, enterprises whose data were incomplete during the study period were also excluded from the sample. After excluding all enterprises that did not meet the criteria, the final sample included 661 non-financial companies.

As shown in Table 2 below, 661 companies are spread out in 10 sectors or industries. The largest sample is consumer cyclicals sector which has 129 members and the smallest is healthcare which has 24 members. Table 2 also displays average sales and returns for each sector and for 661 companies as a whole. The energy sector, which consists of 74 companies, has average sales of IDR 11.75 trillion and an average return of 1.31, while 71 companies in property & real estate sector have average sales of IDR 1.28 trillion. The smallest return was found in technology sector (0.63).

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Table 2 Final Sample

No	Sektor	Sub Industry Code	N	Average Sales (b.IDR)	Mean Return
1	Energy	A111, A112, A121, A122, A131, A132, A211	74	11,751	1.31
2	Basic Material	B111, B112, B113, B121, B131, B141, B142, B143, B144, B146, B151, B152,B153	94	5,930	0.93
3	Industrial	C121, C131, C141, C143, C211, C223, C224, C231, C232, C311	54	10,362	1.16
4	Consumer Non-Cyclicals	D111, D112, D113, D211, D212, D221, D222, D231, D232, D311, D421	104	11,024	1.02
5	Consumer Cyclicals	E111, E112, E212, E213, E321, E411, E412, E413, E512, E513, E514, E515, E521, E522, E611, E612, E613, E614, E621, E711, E731, E741, E742, E743,E745	129	3,016	0.94
6	Healthcare	F112, F121, F211	24	4,013	0.81
7	Property & Real Estate	H111, H112	71	1,284	0.88
8	Technology	I111, I121, I131, I211, I221, I231	28	4,326	0.63
9	Infrastructures	J111, J112, J113, J211, J311, J312, J321, J411, J421	57	7,247	1.00
10	Transportation & Logistic	K111, K132, K211	26	2,680	0.89
	Jumlah		661	6,526	0.97

Data

According to the research variables, the data needed includes stock prices and some financial information of the sample companies:

Data is needed to calculate annual returns and market multiple. Therefore, the data is closing stock price at the end of 2021 and 2022. This data is available in Yahoo Finance which is obtained online by accessing www.yahoofinance.

Financial information includes the data of balance sheet and income statement of non-financial companies, needed to calculate financial ratios as representatives for variables. Data is available on Indonesian Capital Market (IDX) which can be obtained by accessing IDX digital data, a database containing market and financial information for all listed companies, created by IDX to meet investor needs. If there is a lack of data, the step taken is to directly access the company's financial reports which are also available on IDX website.

We also use primary data on factors that investors consider when they are looking to invest in the long term. This information was obtained through focus group discussions (FGD) involving stock investors as participants.

Empirical Model and Analysis

An empirical model is specified to explain the relationship between variables as follows:

$$R\ (0,1) = \alpha + \beta_1\, ROA + \beta_2\, ROE + \beta_3\, EPS + \beta_4\, D/E + \beta_5\, D/A + \beta_6\, S/A$$

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$$+\beta_7 \text{MARGIN} + \beta_8 \text{P/E} + \beta_9 \text{Div} + e$$

The coefficient is estimated using a logistic regression (LOGIT), with the following model (UI, 2023:1):

$$\pi(x) = \frac{\exp(g(x))}{1 + \exp(g(x))}$$

Where $\pi(x)$ is the proportion of occurrence of an event and $g(x) = \beta_0 + \beta_1 x_1 + \ldots + \beta_p x_p$.

Logistic regression analysis does not require a normal distribution in independent variables (Ghozali, 2018:325), so the classical assumption test is not needed. Two tests are needed to assess the feasibility of the model, Hosmer-Lemeshow and Nagelkerke Rsquare (UI, 2023:3). The first is used to ensure whether the model fits the data (Goodness of Fit). If the significance value of the Chi-Square statistic is greater than 5%, then the model is said to be feasible. The second functions as a determination coefficient measuring the ability of the independent variable to explain the dependent variable.

In logistic regression there is an analogous statistic known as Wald statistic, which has a special chi-square distribution like t-test in linear regression (Field, 2009:269). The p-value is less than 0.05 indicating a significant effect of the independent variable on the dependent variable. Conversely, a p-value greater than 0.05 indicates that the predictor has no contribution to the model.

Results

Descriptive Statistics of Variables

Before carrying out logistic regression, we first present descriptive statistics for each variable, calculated from a sample of 661 non-financial companies.

Table 3Summary of Descriptive Statistics for Research Variables

Stock return R: $Price_{2022}/Price_{2021}$; ROA: Return on Assets; ROE: Return on Equity; EPS: Earnings per Share; S/A: Assets Turn Over; EBT/S: Earnings Before Tax to Sales; NPM: Net Profit Margin; D/A: Debt to Total Assets; D/E: Debt to Book Value Equity; P/E: Price to Earnings; Div: Dividend.

No	Variabel	N	Mean	Median	Deviation Standard
1	R	661	0.49	0.00	0.50
2	ROA	661	0.03	0.02	0.24
3	ROE	661	0.02	0.05	0.81
4	EPS	661	0.50	0.00	0.50
5	S/A	661	0.86	0.60	1.28
6	EBT/S	661	0.02	0.04	6.87
7	NPM	661	0.03	0.05	6.46
8	D/A	661	0.60	0.43	2.20
9	D/E	661	0.15	0.65	24.58
10	P/E	661	39.50	8.76	602.00
11	DIV	661	0.36	0.00	0.48

Stock returns are a binary variable: the value is 1 if the return is above the median and 0 if it is below the median. The average return of 0.49 shows that 49% of companies have returns above the median, with a data variation of 0.50. The average ROA is 3% and ROE is 2% with data variations of less than 1. Like returns, EPS is binary, where half of the data is above the median.

The variables that represent efficiency in activities, namely S/A, EBT/S and NPM, are relatively weak or less than 1, with a fairly high level of data variation, as indicated by the standard deviation. Leverage is

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represented by D/A and D/E, where the average value of D/A is higher than D/E, however, D/E has a relatively higher standard deviation. The P/E variable has an average value of 39.50 times with very large data variations around the average. The dividend policy variable defined in binary has an average value of 0.36, explaining that 36% of non-financial companies distribute dividends.

Correlation Matrix

Table 4 displays a correlation matrix between independent variables, where most of the observed relationships have a negative correlation with a value of each below 60%.

Table 4 Correlation Matrix

Stock return R: $Price_{2022}/Price_{2021}$; ROA: Return on Assets; ROE: Return on Equity; EPS: Earnings per Share; S/A: Assets Turn Over; EBT/S: Earnings Before Tax to Sales; NPM: Net Profit Margin; D/A: Debt to Total Assets; D/E: Debt to Book Value Equity; P/E: Price to Earnings; Div: Dividend.

		ROA	ROE	EPS	S/A	EBT/S	NPM	D/A	D/E	P/E	DIV
	ROA	1.000									
	ROE	-.392	1.000								
	EPS	-.333	-.046	1.000							
	S/A	-.082	.021	-.058	1.000						
	EBT/S	-.086	.184	-.017	.020	1.000					
	NPM	.074	-.180	.018	-.020	-.498	1.000				
	D/A	-.700	.302	.222	-.047	.070	-.059	1.000			
	D/E	-.157	.501	-.041	-.035	.291	-.291	.131	1.000		
	P/E	-.009	-.017	.047	-.055	-.014	.014	.012	-.015	1.000	
	DIV	-.161	-.007	-.330	-.077	-.015	.015	.167	-.002	.004	1.000

What Signals Are Important?

A number of financial signals representing profitability, efficiency, leverage, growth and dividend policy were tested for their predictive ability on stock returns of 661 non-financial companies. Note that a value of 1 means the stock return is above the median value and 0 otherwise. This means that stock returns have a value of 1 as a consequence of changes in signals being considered. Table 5 below summarizes the results calculated with SPSS 26.

Table 5Summary of Logistic Regression Results

Stock return R: $Price_{2022}/Price_{2021}$; ROA: Return on Assets; ROE: Return on Equity; EPS: Earnings per Share; S/A: Assets Turn Over; EBT/S: Earnings Before Tax to Sales; NPM: Net Profit Margin; D/A: Debt to Total Assets; D/E: Debt to Book Value Equity; P/E: Price to Earnings; Div: Dividend.

	B	**S.E.**	**Wald**	**Df**	**Sig.**	**Exp(B)**
Constant	-0.452	0.149	9.136	1	0.003	0.636
ROA	1.372	0.813	2.846	1	0.092	3.942
ROE	-0.100	0.144	0.486	1	0.486	0.905
EPS	0.881	0.199	19.649	1	0.000	2.414
S/A	0.001	0.082	0.000	1	0.990	1.001
EBT/S	-0.234	0.246	0.905	1	0.342	0.791
NPM	0.220	0.244	0.812	1	0.367	1.246
D/A	-0.107	0.104	1.061	1	0.303	0.898
D/E	-0.022	0.014	2.362	1	0.124	0.978

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P/E	0.000	0.000	0.258	1	0.612	1.000
DIV	0.044	0.194	0.052	1	0.820	1.045
N	661					
-2LL	863.167					
Hosmer- Lemeshow Stat.	10.70 (0.22)					
Nagelkerke R^2	0.10					

Source: SPSS 26 results, August 2023.

The Hosmer-Lemeshow test provides a chi-square statistic of 10.70 with a p-value of 0.22. Because the p-value is greater than 0.05, the model is significant or feasible or fits the data. The Nagelkerke R^2 statistic is 0.10, indicating that stock returns can be explained by the independent variables in the model by 10%.

The predictive power of each variable on stock returns is justified by Wald test. Of the three measures that represent profitability signal, ROA and EPS have positive coefficients and are significant at 5%, while ROE coefficient is negative and not significant. The Exp(B) values of ROA and EPS are 3.94 and 2.41 respectively.

S/A, EBT/S and NPM, three measures that represent efficiency signal in operating activities, have different coefficients but they do not significantly influence stock returns. S/A and NPM have positive coefficients while the EBT/S coefficient is negative.

Two measures that represent signal leverage, D/A and D/E, have negative coefficients but D/E significantly influences stock returns, even though it is only at the 15% level. Other signals such as market multiple (P/E) and dividend policy (Div) have positive coefficients but are not significant.

Size Effect

To test whether company size influences the variable relationships, we formed two groups of companies according to their sales value in 2022: the largest 20% vs the smallest 20%. Logistic regression was applied to each group and the results are summarized in Table 6 below.

Table 6The Effect of Size on Variable Relationships

Stock return R: $Price_{2022}/Price_{2021}$; ROA: Return on Assets; ROE: Return on Equity; EPS: Earnings per Share; S/A: Assets Turn Over; EBT/S: Earnings Before Tax to Sales; NPM: Net Profit Margin; D/A: Debt to Total Assets; D/E: Debt to Book Value Equity; P/E: Price to Earnings; Div: Dividend.

	Logit 1 All Sample	**Logit 2 20% Largest**	**Logit 3 20% Smallest**
	B (Exp(B))	**B (Exp(B))**	**B (Exp(B))**
Constant	-0.452***(0.64)	-1.263*(0.28)	-0.023(0.98)
ROA	1.372**(3.94)	-10.736***(0.00)	-2.645(0.07)
ROE	-0.100(0.91)	4.507***(90.70)	-0.008(0.99)
EPS	0.881***(2.41)	1.033*(2.81)	0.258(1.30)
S/A	0.001(1.00)	0.195(1.22)	-0.951*(0.39)
EBT/S	-0.234(0.79)	2.946*(19.02)	-0.515(0.60)
NPM	0.220(1.25)	0.335(1.40)	0.498(1.65)
D/A	-0.107(0.90)	-0.191(0.83)	-1.158***(0.31)
D/E	-0.022*(0.98)	-0.141(0.87)	-0.032(0.97)
P/E	0.000(1.00)	0.003(1.00)	0.000(1.00)
DIV	0.044(1.05)	0.395(1.49)	0.253(1.29)

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N	661	132	132
-2LL	863.167	159.696	159.943
Hosmer-Lemeshow Stat. (Sig.)	10.70(0.22)	11.72(0.16)	9.42(0.31)
Nagelkerke R^2	0.10	0.21	0.13

***significant at 5%, **significant at 10%, *significant at 15%.

In the group of companies with the largest 20% of sales, the ROA coefficient changes to negative and significant, while ROE and EBT/S become positive and significant. The D/E coefficient remains negative but becomes insignificant. The other coefficients do not change. This indicates that profitability and efficiency are positive signals for stock returns. In other words, investors react positively to the company's profitability and efficiency.

In the group of companies with the smallest 20% of sales, all variables that represent signals about profitability become insignificant. On the other hand, the negative coefficient of D/A becomes very significant. These results support the fact that small companies are more risky than large companies. Therefore, additional leverage in small companies is a negative signal which is followed by a decrease in stock returns.

Sharia Effects

To see whether sharia influence the variable relationships, non-financial companies in the sample are divided into two groups based on their typical shares: sharia or non-shariah. Logistic regression was applied separately to each group. The results of the logistic regression are summarized in Table 7 below.

Table 7 The Effect of Sharia on Variable Relationships

Stock return R: $Price_{2022}/Price_{2021}$; ROA: Return on Assets; ROE: Return on Equity; EPS: Earnings per Share; S/A: Assets Turn Over; EBT/S: Earnings Before Tax to Sales; NPM: Net Profit Margin; D/A: Debt to Total Assets; D/E: Debt to Book Value Equity; P/E: Price to Earnings; Div: Dividend.

	Logit 1 All Sample	**Logit 2 Shariah**	**Logit 3 Non Shariah**
	B (Exp(B))	**B (Exp(B))**	**B (Exp(B))**
Constant	-0.452***(0.64)	-0.507***(0.60)	-0.250(0.78)
ROA	1.372**(3.94)	1.685(5.39)	1.006(2.73)
ROE	-0.100(0.91)	0.243(1.28)	-0.114(0.89)
EPS	0.881***(2.41)	0.895***(2.45)	0.612*(1.84)
S/A	0.001(1.00)	-0.016(0.98)	0.197(1.22)
EBT/S	-0.234(0.79)	0.780(2.18)	-0.317(0.73)
NPM	0.220(1.25)	-0.802(0.45)	0.320(1.38)
D/A	-0.107(0.90)	-0.282(0.75)	-0.112(0.89)
D/E	-0.022*(0.98)	-0.037(0.96)	-0.023*(0.98)
P/E	0.000(1.00)	0.000(1.00)	0.000(0.99)
DIV	0.044(1.05)	0.019(1.02)	0.229(0.50)
N	661	476	185
-2LL	863.167	613.353	239.319
Hosmer- Lemeshow Stat.	10.703 (0.22)	2.559 (0.96)	3.267 (0.917)
Nagelkerke R^2	0.10	0.12	0.12

***significant at 5%, **significant at 10%, *significant at 15%.

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As shown in Table 7 above, the ROA coefficient previously significant for total data changed to insignificant when logistic regression was applied only to sharia data group. EPS is the only significant variable for the same data group. However, the coefficients of S/A, EBT/S and NPM change sign but remain insignificant. The leverage coefficients, D/A and D/E, remain negative and insignificant. The variable of dividend policy and market multiple (P/E) remain positive and insignificant. In non-shariah data group, EPS has a positive coefficient and D/E is negative but both variables are significant only at the 15% level.

The different influence of factors on stock returns according to sharia and non-shariah data categories may have implications for investor behavior in countries like Indonesia where many sharia stock are traded on the stock market, a case that is not found in other countries, especially in advanced industrial countries. This is an interesting issue for future research.

Industrial Effects

The strength of a factor's influence on stock returns may differ across industries. We test for this effect by integrating an industry dummy variable into the model, where the value is 1 if a firm is a member of a particular industry and 0 otherwise. Thus, there are 10 industry dummies representing 10 industries. Because each industry dummy is regressed on stock returns, together with other independent variables, there are 10 logistic regressions specified (Logit2 to Logit11). The results are summarized in Table 4.6.

As in Table 8, all 10 logits have the same Nagelkerke R2 statistic as the logit for the entire sample (logit1) and that the significance levels of all Hosmer-Lemeshow statistics are greater than 5%. Partially, all industry dummy coefficients are not significant for all logits (logit2 to 11), while the coefficients of all independent variables have the same sign and significance. Based on these results it can be said that industry characteristics do not change the results.

Table 8 The Effect of Industry Characteristics on Variable Relationships

Stock return R: $Price_{2022}/Price_{2021}$; ROA: Return on Assets; ROE: Return on Equity; EPS: Earnings per Share; S/A: Assets Turn Over; EBT/S: Earnings Before Tax to Sales; NPM: Net Profit Margin; D/A: Debt to Total Assets; D/E: Debt to Book Value Equity; P/E: Price to Earnings; Div: Dividend.

	Logit I_1	Logit I_2	Logit I_3	Logit I_4	Logit I_5	Logit I_6	Logit I_7	Logit I_8	Logit I_9	Logit I_{10}	Logit I_{11}
Constant	-0.452***	-0.448***	-0.457***	-0.435***	-0.457***	-0.458***	-0.450***	-0.455***	-0.452***	-0.455***	-0.451***
D1		-0.029									
D2			0.039								
D3				-0.216							
D4					0.041						
D5						0.040					
D6							-0.036				
D7								0.019			
D8									0.026		
D9										0.030	
D10											-0.016
ROA	1.372**	1.380**	1.370**	1.375**	1.369**	1.395**	1.377**	1.371**	1.373**	1.378**	1.375**
ROE	-0.100	-0.101	-0.099	-0.099	-0.100	-0.102	-0.101	-0.100	-0.101	-0.101	-0.100
EPS	0.881***	0.880***	0.882***	0.881***	0.884***	0.878***	0.880***	0.881***	0.881***	0.881***	0.881***

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S/A	0.001	0.001	0.001	0.000	-0.001	0.001	0.001	0.002	-0.001	0.002	0.001
EBT/S	-0.234	-0.234	-0.236	-0.232	-0.234	-0.231	-0.234	-0.234	-0.234	-0.234	-0.234
NPM	0.220	0.220	0.222	0.218	0.220	0.217	0.220	0.220	0.220	0.220	0.220
D/A	-0.107	-0.108	-0.107	-0.107	-0.107	-0.110	-0.108	-0.107	-0.107	-0.108	-0.108
D/E	-0.022*	-0.022*	-0.022*	-0.022*	-0.022*	-0.022*	-0.022*	-0.022*	-0.022*	-0.022*	-0.022*
P/E	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DIV	0.044	0.044	0.042	0.047	0.040	0.047	0.046	0.045	0.045	0.044	0.043
N	661	661	661	661	661	661	661	661	661	661	661
-2LL	863.167	863.155	863.140	862.635	863.135	863.131	863.160	863.162	863.164	863.157	863.166
Hosmer-Lemeshow Stat. (sig.)	10.70(0.22)	9.30(0.32)	11.47(0.18)	7.63(0.47)	10.22(0.25)	3.88(0.87)	14.97(0.06)	8.74(0.36)	10.79(0.21)	6.57(0.58)	9.85(0.28)
Nagelkerke R^2	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10

***significant at 5%, **significant at 10%, *significant at 15%.

Discussion

Our study reveals surprising facts about variable relationships, where the variables previously identified to influence stock returns most of them in this study have insignificant effects. However, only three variables significantly influence stock returns, including ROA and EPS (profitability measures) with a positive coefficients and D/E as a leverage measure with a negative coefficient. The three significant variables are signals for stock returns movement. Other variables representing efficiency (S/S, EBT/S, and NPM), dividend policy (div), and market multiple (P/E) are not significant.

ROA and EPS have a positive effect on stock returns because an increase in both variables gives a signal to investors about the company's improved ability to obtain future cash flows, while the negative effect of leverage explains the increased probability that a company will be in a situation of financial distress (Shakeel & Gohar, 2018; Endri, et al., 2019).

Do our findings represent facts in emerging markets like Indonesia? we analyzed the results obtained more deeply by examining observed relationships in three conditions that might influence investors to invest in emerging markets such as Indonesia, including size, sharia, and industry.

When regression is applied to data covering companies with the largest 20% size, the ROE and EBT/S coefficients become positive and significant, while the D/E coefficient remains negative but changes to be insignificant. These results indicate that in large companies in Indonesia, stock returns are changed by profitability signals but not by leverage. On the other hand, in data on companies with the smallest 20% size, the negative influence of leverage (D/A) becomes very significant, indicating the high risk of small companies in the eyes of investors. The results of this study reveal the fact that the signals that influence investors to invest in Indonesia differ according to company size, where profitability is the main driver for choosing shares in large companies, whereas in small companies, leverage which increases risk limits investors from investing.

Indonesian stock market is known as a market that records and trades many sharia shares or companies, this may be due to Indonesia's condition as a country with the largest Muslim population in the world. In our sample of 661 non-financial companies, 476 are companies that list their shares as sharia. To test

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whether sharia influences the results obtained, we separated data on sharia companies (476 companies) from non-shariah (185 companies) and applied logistic regression for each group of data. The result is that EPS is the only significant variable in sharia data, while in non-shariah data, the EPS coefficient is positive and D/E is negative but both are significant only at the 15% level. The large number of shares or companies in the sharia category in our sample may be the answer to why the EPS variable significantly influences stock returns. This result is a reflection of the behavior of sharia investors who have a great tendency to obtain real returns on their investments and ignore leverage. On the other hand, in the non-shariah category, changes in debt levels still affect stock returns.

All industry dummy variables are not significant. The coefficients of the variables found significant in the regression with entire sample also have the same sign and significance level even though the industry dummy is integrated into model. These results indicate that stock returns do not reflect industry conditions as previously thought as a representation of return and risk.

Conclusion

Our study, based on a sample covering a large number of nonfinancial firms, found surprising facts about several financial signals that can change stock returns in emerging stock markets like Indonesia. It is shown that variables found in previous studies to influence stock returns, in fact most of them have insignificant coefficients in this study. Only three signals affect significantly stock returns, including ROA and EPS as measures of profitability with positive coefficients and D/E representing leverage with a negative coefficient.

Size seems to be important due to the fact that in large firms, stock returns are strongly affected by profitability while in small firms, stock returns move in the opposite direction to leverage, implying a high risk for small firms.

The analysis indicates a shariah effect according to the positive and significant of the EPS variable, reflecting the behavior of sharia investors who tend to focus on real returns on their investments but ignore leverage. However, in non-shariah data group, the EPS coefficient is still positive and D/E is negative, but both are significant only at the 15% level. The large number of sharia companies or shares in the sample may be the answer to why the EPS variable influences returns so significantly, while in non-sharia companies, changes in debt levels affect stock returns.

All industry dummy variables have insignificant coefficients. The coefficients of the variables that were previously found to be significant in the regression with the entire sample also have the same sign and significance even though the industry dummy variable is integrated into the model. With these results, stock returns are not influenced by industry or sector characteristics.

This study provides facts about stock return movements as a reaction to a number of financial signals. It is recommended to use profitability as the main consideration for investing in shares of large companies, while in shares of small companies, leverage can be used to limit investment. For variables that are not significant, we address them for further research. The study of the effects of sharia on the Indonesian stock market in particular is very challenging to explore in future research.

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