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Google trend and stock market: Does it matter?

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Abstract
This study aims to determine the effect of the financial ratio and Google search volume (GSV) on stock returns of LQ-45 companies listed on the IDX for the 2015-2020 period. The study used purposive sampling and applied multiple linear regression analysis. The results showed that the Current Ratio (CR) and Return on Assets (ROA) insignificantly affect stock returns. Meanwhile, the Debt-to-Equity Ratio (DER) hurts stock returns significantly. This finding implies that signals from search data volume can help build profitable trading strategies.

Keywords: *Current Ratio; Debt to Equity Ratio; Return on Asset; Google Search Volume; Stock Return*

Introduction

Investing in the capital market is an investment with a high risk, so investors must be careful when purchasing shares or securities. This caution is very reasonable because every investor will think to maximize the expected return from every rupiah they invest in securities (Sudiyatno & Irsad, 2011). According to Gitman (2012), return is the number of gains and losses from an investment over a certain period which is generally measured as a change in value-added with the money distributed over a certain period and is expressed as a percentage of the initial investment value. Returns can be categorized into two things, namely in the form of stock price appreciation or when the selling price is higher than the purchase price and dividends or profit sharing to shareholders (Simamora, 2010). Stock returns are divided into two, namely realized returns and expected returns. Realized return is a return that has occurred and is calculated based on historical data. This return is essential in measuring the company's performance and as a basis for determining future returns and risks. The expected return is the expected return in the future and is still uncertain (Jogiyanto, 2013).

Sudiyatno and Irsad (2011) state that many factors can affect stock returns, including information of a fundamental and technical nature. Therefore, a benchmark is needed to analyze it. This essential factor can be seen from its financial reports, which are published every three months. From the description, stock exchange issuers can know the level of financial performance from the ability to generate profits, the ability to pay debts, the structure, and the level of efficiency and effectiveness in managing their wealth (Jogiyanto, 2013). The analytical technique used to make long-term stock investment decisions is fundamental analysis, which is an analytical technique that focuses on financial ratios. Financial ratio analysis helps compare numbers to avoid misinterpreting absolute numbers in financial statements.

Several ratio analyses will be used as a fundamental instrument in measuring the level of success of a company, namely the ratio of liquidity, solvency, and profitability. The liquidity ratio measures the company's ability to pay the short-term debt by looking at its current assets relative to its existing debt. Research conducted by Dewi (2017) uses the CR as a proxy for liquidity. The results of this study show that the current ratio has a positive and significant effect on the stock returns of manufacturing companies listed on the IDX from 2011-2015. However, in the research conducted by Gunawan & Hardyani (2014), the liquidity ratio with the current ratio proxy does not significantly affect stock returns in manufacturing companies; this indicates that information from the current balance does not cause changes in stock returns in manufacturing companies, so the data presented in the current ratio is less attractive to investors as a basis for consideration in evaluating company performance.

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The solvency ratio is usually measured using the DER ratio. Helfert (1998) argues that DER is an attempt to show the relative proportion of lenders to ownership rights and is used as a measure of the role of debt. Therefore, the higher the DER ratio, the smaller the rate of return received by investors in the form of dividends. The results of research by Thrisye & Simu (2013) and Dewi (2017) show that DER has adverse and significant effects on stock returns. The greater the DER ratio, the greater the company's burden on external parties, either in the form of principal or interest on the loan. Research conducted by Gunawan and Hardyani (2014) shows that the DER value does not cause changes in stock returns in manufacturing companies.

The following ratio analysis is the ROA as a tool to measure a company's profitability level. ROA is a measure of profitability from the point of view of company assets; the higher the ROA value reflects, the higher the company's ability to manage its assets to earn a profit. In research conducted by Sutriani (2014), using ROA as a proxy for profitability, the results have a positive and significant effect on stock returns. When looking for information about stocks that investors want to buy, investors will face difficulties with a large number of stocks on the market, so the capacity of investors to process investor information will pay more attention to some stocks and ignore other stocks. As a result, they tend to buy shares based on the value of a company. Now, the development of the world capital market has been supported by the development of increasingly sophisticated technology and information. In today's all-digital, investors will more quickly receive good and bad news that is only in their hands; of course, this can influence investors' policies in investing.

A vast empirical literature has tried to explore the contribution of information retrieved from the internet in the context of developed markets. Bank et al. (2011) examined the effect of asymmetric information measured by using Google Insight in explaining the variation of return and liquidity on the German Stock Exchange. Da, Engelberg, & Gao (2011), the impact of online search on abnormal stock returns and their relation to trading volume by using investor sentiment towards S&P 500 stocks. Investors who feel that the information is still lacking tend to use the internet to find information. If they pay attention to something, they will look for information on the internet. The more accessible access to information, the easier it is for investors to make investment decisions. Increased searches will increase trading volume and push stock prices up in the short term. Research on the most prominent American companies shows that internet search volume positively relates to volatility and trading volume (Kim et al., 2019). Bank et al . (2011) find that an increase in search volume (in the short term) results in higher future returns. This explanation is supported by research by Swamy et al. (2019), which states that GSV positively affects stock returns.

In this study, we try to correlate the influence of GSV on stock returns in the Indonesian capital market. We focused our analysis on the empirical evidence from several types of research conducted by Nurazi et al. (2015) and Nguyen et al. (2019), stating that GSV was captured through Google Trends to determine the effect of the internet search on trading volume. Their study shows that the Google trend influences trading volume, which results in changes in stock returns in the short term. If we look at the data on technological developments in Indonesia, Indonesia has progressed rapidly in the last five years.

Based on data from the Central Statistics Agency/(BPS), The percentage of the population using cellular phones continued to increase until, in 2018, it reached 62.41 percent. The change was also followed by computer ownership and internet access in households which gained 20.05 percent and 66.22 respectively. Internet use increased during the 2014-2018 period, as indicated by the population accessing the internet in 2014 from around 17.14 percent to 39.90 percent in 2018. However, to prove this phenomenon, it is necessary to conduct a study on whether investors in Indonesia also use information from the internet to make a decision. So that this research can also be helpful for issuers, whether information about the company's condition published through the internet impacts the company in addition to the benefits received by the investors.

This study aims to determine the effect of financial ratio analysis and Google search volume on stock returns of LQ-45 companies listed on the IDX for the 2015-2020 period. In detail, this study aims to: a) determine the effect of the current ratio (CR) on stock returns; b) know the effect of the Debt-to-Equity Ratio (DER) on stock returns; c) determine the effect of Return on Assets (ROA) on stock returns, and d) determine the effect of google search volume (GSV) on stock returns. Our study expands the literature on the model of stock price movements which are not only proxied by financial ratio factors or monetary and macro variables but also extend to the direction of Google trends.

Literature Review

This literature review discusses stock returns, financial ratio, and google search volume. The basic ideas related to using these concepts come from two aspects; the relationship between returns and

financial ratio, investors' attention that describes information entering the market, and the amount of incoming information related to the realization of companies that provide higher returns to investors. With this idea, we use the data recorded from search queries on Google as a proxy for investor concern. Previous empirical tests reported satisfactory results to support this study which is believed that the relationship between financial ratios and google searches is due to the content information.

Return and Financial Ratio

Return is the result obtained from an investment of funds that have been invested that investors can enjoy. Investors must realize that in addition to making profits, it is also possible that they will experience losses. The profits or losses experienced by investors are strongly influenced by the ability of an investor to analyze the state of stock prices. Returns can be in the form of realized returns, namely returns that have occurred, calculated based on historical data, and used to measure company performance Jogiyanto, 2013). Return is a reward for the courage of investors to take risks on their investments (Tandelilin, 2010). According to Brigham & Houston (2011), returns are divided into three namely: 1) Required return, namely the minimum rate of return that can be accepted; 2) Actual (realized) return, namely the rate of return that occurs; 3) Expected return is the rate of return that is expected to be received in the future.

Meanwhile, Financial ratios can describe a company's financial condition at a particular time (Thrisye and Simu, 2013). The analytical technique used to make long-term stock investment decisions is fundamental analysis, which is an analytical technique that focuses on financial ratios (Ginting & Erward, 2013). The financial ratio analysis used in this study is as follows

Liquidity shows the company's ability to pay off short-term debt (current debt) using its existing assets. High liquidity offers the company's ability to meet its short-term obligations. Meanwhile, the liquidity ratio determines how much the company can meet its short term with available funds. The proxy used is the CR because this proxy shows the company's ability to meet its short-term obligations through stock returns (Dewi, 2017). A company that can fulfill its financial obligations on time is in a liquid state. It is said to be able to meet its financial obligations on time if the company has payment instruments or assets more significant than its current liabilities or short-term debt. On the other hand, if the company cannot immediately fulfill its financial obligations at maturity, it means that the company is in an illiquid state (Munawir, 2012).

H1: CR has a positive and significant effect on stock returns

Solvency is a tool to measure how much the company's ability to pay all company debts to creditors to finance company assets. In this research, the researcher uses the long-term debt ratio as a proxy for the DER to measure the company's solvency. According to Erari (2014), the DER is the ratio used to measure the level of solvency. Solvency talks about the company's efficiency in utilizing owner's equity to anticipate long-term and short-term debt. Solvency is related to the capital structure: the comparison or proportion of total debt with the company's capital. Capital structure decisions related to selecting sources of funds, both from within and outside, significantly affect the company's value. A company can be solvable if it has sufficient assets or wealth to pay all its debts. On the contrary, the company is in an insolvable state if the total assets are insufficient or less than the total debt (Munawir, 2012). DER shows the company's ability to meet all its financial obligations when liquidated.

H2: DER has a negative and significant effect on stock returns

This study measures a company's profitability using Return On Assets (ROA). ROA is a ratio used to measure the level of profitability. Profitability measures the company's ability to generate profits in operational activities. Profit is the main focus in assessing the company's performance (fundamental analysis of the company) because the company's profit is not only an indicator of the company's ability to fulfill obligations to its funders, but it is also an element in creating a company value that shows the company's prospects in the future (Erari, 2014). Sartono (2014) reveals that the greater the profitability, the better the company's financial performance because the company's owner's prosperity increases. Return on assets measures how much profit can be obtained from all assets owned and invested in a company. If the ROA is high, the company is effective in managing its assets.

H3: ROA has a positive and significant effect on stock returns

Google Search Volume and Return

Google Search Volume (GSV) is provided by one of the Google features presented with Google Trends. Google Trends is a public tool that offers normalized and reduced search volume data for a particular

search, the actual search volume normalized by the total search volume of all keywords (Aouadi et al., 2013). Google Trends calculates the search rate based on each word used (Perlin et al., 2016). Each search data point is divided by the total searches in a given geography and period. Search results show the proportion of all searches on all topics on Google at the same time and region. Intuitively, when someone googles or searches for something with the Google platform, they pay attention to it (Da, Engelberg, & Gao, 2011). Efforts to find information online through Google are one of the efforts to reduce the information asymmetry between informed and uninformed investors (Usman & Tandelilin, 2015). When investors have more information about a company, the level of information asymmetry will decrease. Google Trends allows users to filter their search volume (e.g., in a country or related industry) to get more precise results (Bank et al., 2011). Filtering the search volume can reduce the error rate of the search volume.

H4: GSV has a positive and significant effect on stock returns

GSV will be biased because of many factors that affect stock returns; therefore, based on the previous literature, which explains the ratio analysts who have the potential to affect stock returns, this study combines these variables as a reference to strengthen the results of the research analysis. Therefore, based on the previous literature that explains the ratio analysts who have the potential to affect stock returns, this study combines these variables as a reference. Strengthening the results of the research analysis in this study can be illustrated in the conceptual framework in Figure 1.

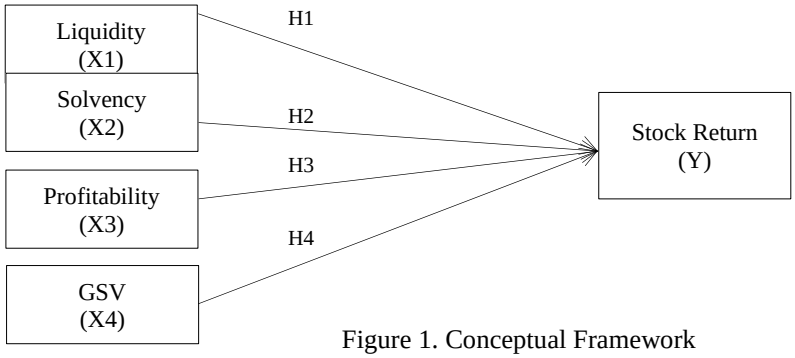

Figure 1. Conceptual Framework

Research Method

The population in this study are all companies included in the LQ 45 index on the Indonesia Stock Exchange for the period 2015 – 2020. While the sample in this study uses a purposive sampling method, the criteria used are 1) Companies consistently listed in the LQ-45 index consistently consecutively in the 2015 – 2020 period; this indicates that the shares are actively traded by investors, have a high level of liquidity, and have a large market capitalization on the Indonesia Stock Exchange. 2) LQ-45 companies engaged in non-banking activities; 3) Companies that do not have a ticker with general meaning and ambiguity are excluded from the research sample to minimize noise during the Google search volume index search process. The ticker used in this study is a company code consisting of 4 letters. Table 1 presents the sample screening method used in this study. Furthermore, the analysis in this study uses multiple linear regression with SPSS version 16.

Tandelilin (2010) and Hartono (2017) state that one factor that motivates investors to invest is the reward for the investor's courage to take the risk on the investment made. However, we focus on individual companies' actual returns (AR) and use the monthly IDX data. As such, we use the formula (1). Liquidity proxied to the CR shows the company's ability to pay the current debt using assets owned. High liquidity offers the company's ability to meet its short-term obligations. CR is measured using the following equation (2). Solvency is proxied by the Debt to Equity Ratio (DER), which shows the ratio between the total liabilities to the total capital. The smaller the percentage, the more influential the company is because the company owns the funds used. DER is measured using equation (3). Profitability as a proxy for Return on Assets (ROA) is used to measure the company's ability with the general funds invested in assets used for company operations to generate profits. In other words, this ratio connects the earnings from the company's operations with the amount of investment or assets used in generating these profits. The profitability calculation with ROA divides net income after tax by total assets. ROA is measured using equation (4).

Table 1. Accumulation of research sample

Criteria	Amount	Accumulation(2015-2020)
A consistent company has never been delisted on the LQ-45 index during the 2015-2020 period	27	162
Companies listed on the LQ-45 index are engaged in non-banking activities	(5)	(30)
Companies that do not have a ticker with general meaning and ambiguity are excluded from the research sample to minimize noise during the Google search volume index search process.	(1)	(6)
Number of Samples	21	126

$$R_t = \frac{Pt-Pt-1}{Pt-1} *100 \quad (1)$$

$$CR = \frac{Current\ Assets}{Current\ Liabilities} *100\% \quad (2)$$

$$DER = \frac{Total\ Liabilities}{Total\ Capital} *100\% \quad (3)$$

$$ROA = \frac{Net\ Income}{Total\ Asset} *100\% \quad (4)$$

GSV is based on the number of searches for a given keyword among searches performed for all keywords during the same period; The weekly GSV for keyword searches is the number of searches for that keyword scaled by a time series average with a value between 0 and 100; GSV does not increase when the number of searches for a given keyword is less than for another; The GSV for a given week may vary over a given period as the GSV 100 represents the highest number of searches during the specified period (Swamy et al., 2019). Google Trends provides the GSV as an index over time of the total search volume for a given company name, either globally or in a defined region. We collect GSV data on companies in Indonesia included in the LQ-45 index using weekly data. Using Google's trend requires a ticker. We saw that many tickers are also standard abbreviations. Therefore, using a company name or part of a famous company name is more meaningful in generating a search volume index. We use the four-letter company, which is usually the code of an issuer, to reduce search ambiguity.

The multiple Linear Regression Model is used to test the significant relationship between financial ratio and google search volume on stock returns of LQ-45 companies. The relationship is explained by equation (5). Where Y is stock return; C is Constant; CR is a representation of the Current Ratio; DER is Debt to Equity Ratio; ROA is Return On Assets; GSV is Google Search Volume, and e is the error term.

$$Y = a + b1\ CR_1 + b2\ DER_2 + b3\ ROA_3 + b4\ GSV_4 + e \quad (5)$$

Result and Discussion

Some data must be omitted because they have extreme values that cause the data to be not normally distributed. The initial data were 126, and after eliminating the data indicated by outliers, the number of observations became 120. We also confirmed that there was no multicollinearity, no heteroscedasticity, and no random residuals or autocorrelation. R2 in regression measures the model's predictability over the sample period or how well the regression is estimated based on the data. R2 is the proportion of variation of the dependent variable described by the regression model. The higher the R2 value, the higher the percentage of interpretation of the dependent variable explained by the regression. It is better for the goodness of fit for the observation sample.

On the other hand, a low value of R2 indicates that the model does not match the data correctly. The results of estimating the regression model used in this study are presented in Table 2. Table 2 shows that the R-square is 8.4%, which shows the contribution of the model used in the study, namely the current ratio (CR). The debt-to-equity ratio (DER), return on assets (ROA), and Google search volume (GSV) at a share yield of 8.4%. At the same time, other factors influence the rest.

The variable current ratio (CR) has a negative regression coefficient of -0.001; This shows the direction of the influence of the current ratio on stock returns which is significantly detrimental. So every 1% increase in the current ratio (CR) variable causes a decrease in stock returns of 0.001 with the assumption that other variables are constant. The variable debt to equity ratio (DER) has a negative regression coefficient of -0.005; this shows the effect of DER on significantly detrimental stock returns. So every 1% increase in DER causes a decrease in stock returns of 0.005. The ROA variable has a negative regression coefficient of -0.016, So every 1% increase in ROA causes a reduction in stock returns of 0.016. The google search volume (GSV) variable has a positive regression coefficient of 0.05; this shows the effect of Google search volume (GSV) on stock returns, which is significantly detrimental. So every 1% increase in the google search volume (GSV) variable causes an increase in stock returns of 0.05 with the assumption that other variables are constant.

Table 2. Model Summary and Regression coefficients

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	T	Sig.
(Constant)	-.002	.011		-.190	.849
CR	-.002	.002	-.084	-.803	.424
DER	-.006	.002	-.244	-2.364	.020
ROA	-.014	.023	-.056	-.612	.542
GSV	.048	.023	.192	2.093	.039
R-squared	0.84				

Based on Table 2, the significance value of CR is higher than the significance level (0.548 > 0.05), so it can be concluded that H1 is rejected and H0 is accepted, which means that the current ratio (CR) variable does not have a positive effect on the stock returns of issuers on the LQ-index. 45. This illustrates that using short-term debt is not considered a risk by investors but rather a company strategy in obtaining financing sources for the company's short-term operations to gain profits. Thus, CR is not a factor that investors must consider because the use of short-term debt can be adjusted to the company's objectives. This study's results align with research by Gunawan and Hardyani (2014) and Azzahra & Sutanto (2016). However, unlike Dewi's (2017) and Santosa's (2019) research, the study's results show that CR significantly affects stock returns. The higher the exchange rate, the greater the company can meet its short-term financial obligations. The better the current ratio reflects, the more liquid the company is, so the more significant the ability to meet its short-term capacity; this will increase the company's credibility in the eyes of investors to increase the company's stock return.

The test results show that the Debt to Equity Ratio has a negative and significant effect on Stock Return in LQ-45 companies for the 2015-2020 period with a significance value of 0.028 <0.05, so H2 is accepted and H0 is rejected; this means that the Debt to Equity Ratio (DER) variable hurts stock returns. From an investor's point of view, the higher the value of the Debt to Equity Ratio indicates, the greater the company's dependence on outside parties so that the company's risk level is more significant in fulfilling its debt obligations and added to the interest; this impacts the decline in stock prices so that Stock Returns decline. This decline in stock returns will reduce investors' interest in investing their funds in the company. These results are supported by research conducted by Thrisye & Simu (2013), Dewi (2017), and Latifah (2020). DER has significant effects on stock returns. The more outstanding the Debt to Equity Ratio, the greater the company's burden on external parties, either in the form of principal or interest on the loan. The results of this study differ from those of Gunawan and Hardyani (2014) and Azzahra & Sutanto (2016) in their research results, stating that DER has no significant effect on stock returns, which means that this indicates that the debt ratio does not cause changes in stock returns.

The test results show that Return On Assets (ROA) has no effect on stock returns in LQ-45 companies for the 2015-2020 period with a significance value of 0.497 > 0.05, so H3 is rejected, and H0 is accepted. This condition illustrates that although the company's average profit continues to increase yearly, this is not necessarily followed by a high asset return; this happens because an increase does not follow the high value of assets stored in the company in company assets to earn profits; this is in line with the results of research by Nidianti (2013), and Hertina et al. (2019) the test shows that Return On Assets (ROA) has no effect on stock returns in property and real estate companies for the period 2012-2016. The results of this study are different from those conducted by Dewi (2017), Santosa (2019), and Latifah

(2020), which show that ROA has a positive effect on stock returns. The increase in Return on Assets means that the company's performance is improving, and as a result, the company's stock price is increasing. The company's stock returns increased with the rise in stock prices.

The test results show that Return On Assets (ROA) has no effect on stock returns in LQ-45 companies for the 2015-2020 period with a significance value of 0.497 > 0.05, so H3 is rejected, and H0 is accepted. This condition illustrates that although the company's average profit continues to increase yearly, this is not necessarily followed by a high asset return; this happens because the high value of assets stored in the company is not followed by increased company assets to earn profits; this is in line with the results of research by Nidianti (2013), and Hertina et al. (2019). The test shows that Return On Assets (ROA) has no effect on property and real estate company stock returns for 2012-2016. The results of this study are different from those conducted by Dewi (2017), Santosa (2019), and Latifah (2020), which show that ROA has a positive effect on stock returns. The increase in Return on Assets means that the company's performance is improving, and as a result, the company's stock price is increasing. The company's stock returns increased with the increase in stock prices.

The test results show that Google Search Volume (GSV) with a significance value of 0.023 <0.05, so H4 is accepted and H0 is rejected. From there, it can be concluded that the active attention of investors, as measured by using Google Search Volume (GSV), has a positive and significant effect on stock returns in LQ-45 companies for the 2015-2020 period. An increase in the number of searches will increase trading volume and push stock prices up in the short term (Da, Engelberg, & Gao, 2011). When trading activity increases, stock prices tend to rise (Tripathy, 2011). Bank et al. (2011) find that increasing search volume (in the short term) results in higher future returns. This explanation is supported by research by Bank et al. (2011), Usman (2012), Swamy & Dharani (2019), and Nguyen et al. (2019), which state that GSV has a positive effect on stock returns. More precisely, high Google search volume predicts positive and significant returns. In the following fourth and fifth weeks. GSV is a valuable predictor of direction and the magnitude of excess returns. This finding implies that signals from search volume data can help build profitable trading strategies. However, the results differ in the Ekinci & Bulut (2020) research, which reveals that Google search is associated with positive returns, especially on small-cap stocks. Still, high search volume in the current period does not predict positive returns in subsequent periods.

Conclusion, Suggestions, and Limitations

Based on the results of various tests, it can be concluded that: 1) Liquidity, which is proxied by the Current Ratio (CR), has no significant effect on stock returns of LQ-45 companies for the 2015-2020 period. 2) Debt to Equity Ratio (DER) has a significant negative effect on stock returns; 3) Profitability as proxied by Return On Assets (ROA) has no significant effect on stock returns; 4) Google Search Volume (GSV) has a significant positive effect on stock returns. Investors can generally consider Google Search Volume, which is proxied by google trends in determining investment decisions. Meanwhile, further research can compare countries with capital markets and investor characteristics similar to Indonesia.

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