Verify the Relationship Between a Company's Earning per Share, Return on Equity, Return on Asset, Sales Growth, Price to Earning Ratio, Current Ratio, Gross Profit Margin, Quick Ratio, Asset Turnover and Its Stock Price

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ABSTRACT. The purpose of this study is to determine possible effect, which earning per share, return on equity, return on asset, sales growth, price to earning ratio, current ratio, gross profit margin, quick ratio, asset turnover can have on the stock price. The research involves 30 sample publicly listed company in 2017-2021, collecting data from balance sheet, financial statement, income statement and finbox website from 30 publicly listed companies and average stock price data from Macrotrends website. The result of this research is gained through multivariate regression, which shows that gross profit margin has significantly impact on stock price, and price to earning ratio has a significantly impact on stock price. Despite these three ratios, the other 6 ratios neither have degree of impacts significant enough to make a conclusion.

1. Introduction

Ratio analysis is one of the methods through which people can analyze or predict the financial condition of a companies. According to Doron Nissim's Ratio Analysis and Equity Valuation: From Research to Practice, in the financial statement analysis, the current ratios can be useful predictors for the future payoff prediction [1]. He points out in his thesis that it is very hard to use the real-world options to analyze the future market value. In this thesis, the assumption is that effects the ratios can possibly act on the stock price is not considered true, but the purpose of this thesis is trying to find out whether this effect is significant enough to conclude a correlation between stock price and the ratio analysis. So, the main point is not the magnitude, but the existence. The purpose is to prove the existence of the correlation but not the quantification of the effect.

In this thesis, all 9 independent variables can be divided into 2 parts: a. Profitability Ratio (EPS, ROE, ROA, Sales Growth, Total assets turnover, Gross Profit Margin, P/E ratio), b. Liquidity Ratio (quick ratio, current ratio).

Talking about the profitability ratio, according to Anna Rutkowska-Ziarko's The Influence of Profitability Ratios and Company Size on Profitability and Investment Risk in the Capital Market, the profitability ratio represents how much the return of a company is associated with the profit made by that company [2]. In this way of understanding, the profitability ratio related to the capability for a company to make profit.

Talking about the liquidity ratio, according to Qasim Saleem's Impacts of liquidity ratios on profitability, liquidity ratios represent a company's capability to pay back the liabilities and other financial crisis [3].

Therefore, through ratio analysis, a companies' current financial and functioning condition can be shown. The stock price is related to the expected return people consider invest on certain stocks. So, the performance of a company is instinct related to the stock price because the good performance of a company will raise the expected return of the stock investment within people's minds; on the contrary, a poor performance of a company will lower the expected return the investor who invest in the stock. So, intuitively, there should be a correlation between a company's performance and its stock price. Because the ratio analysis is used to represent a company's performance, it is logically correct that there should be a correlation between profitability & liquidity ratio and the stock price.

In the thesis, 30 companies are included: Walmart, Amazon, Apple, CVS, Costco, Alphabet, Microsoft, Ford Motor, Tesla, General Motor, Dell, Target, FedEx, intel, NVIDA, AT&T, T-Mobile, HP, JP Morgan, Netflix, PayPal, Abode, Facebook, Dell, Nintendo, AMC, Sony, Fox, Visa, Exxon.

2. Literature review

2.1. Explanation of the 9 ratios

Earnings Per Share (EPS). According to Md. Rashidul Islam's How Earning Per Share (EPS) Affects on Share Price and Firm Value, the term earnings per share

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represents the portion of a company's earnings which are allocated to the one-stock hold [4]. In formula:

$$EPS = \frac{Net\ Income}{weighted\ average\ share} \quad (1)$$

Current ratio. According to Marius Koen's Analysis and Interpretation of Financial Statements, the current ratio "determines to what extent current liabilities are covered by current assets." [5] In this way of understanding, it "concerned with the size and relationship between short-term liabilities and short-term assets." [6] The Current assets are formed by "inventories," "receivables," "bill receivable," and so on [7] "Current liabilities consist of short-term credit from suppliers and accrued expenses." [8] In formula:

$$Current\ ratio = \frac{current\ asset}{current\ liabilities} \quad (2)$$

Return on Equity (ROE). It measures in what portion of the net income will be distributed while holding one unit of equity [9]. In formula:

$$ROE = \frac{Net\ income}{shareholder's\ equity} \quad (3)$$

Return on Assets (ROA). According to Marius, it is "an indication of the return released on the total assets utilized in the asset" [10] In formula:

$$\mathrm{ROA} = \frac{Net\ income}{total\ assets} \quad (4)$$

Sales Growth. Sales growth is the growth rate of the total sales from the past year to the present year, in formula:

$$Sales\ Growth = \frac{current\ year\ sales}{past\ year\ sales} - 1 \quad (5)$$

Price to Earnings ratio (P/E). Yuli Anwar's The effect of return on equity, earning per share and price earning ratio on stock prices, earning per share is net income ready to be shared with shareholders divided by the number of shares of the company. [11] in formula:

$$\mathrm{P/E} = \frac{Share\ price}{Earning\ per\ share} \quad (6)$$

Gross profit margin. According to Talitha Nathaniela Nariswari's Profit Growth: Impact of Net Profit Margin, Gross Profit Margin and Total Assets Turnover, "gross profit margin measures the remaining percentage of the sale if company has paid for its goods." [12] in formula:

$$Gross\ profit\ margin = \frac{growth\ profit}{sales\ revenue} \quad (7)$$

Quick ratio. According to Dennis Prasetya Wijaya's Effects of Quick Ratio, Return on Assets and Exchange Rates on Stock Returns, similar to current ratio, it mainly focuses on the assets and liability; however, for the quick ratio, it mainly focus on the liquidable part [13]. in formula:

$$Quick\ ratio = \frac{cash\ and\ stock\ investment + ccounts\ receivable}{current\ liablities} \quad (8)$$

Asset turnover. It is a ratio which measures the revenue a company can get from one-unit assets, in formula:

$$Asset's\ turnover = \frac{total\ revenue}{total\ assets} \quad (9)$$

2.2. Previous research finding

According to KadekYurikaDwi Safitri's The Impact of Debt-to-Equity Ratio, Price Earning Ratio, Earning per Share to the Stock Price ……2014-2018, he finds a positive relationship between price earnings ratio & earnings per share ratio and stock price [14].

Yuli also studies the effects returns on equity, earning per share, & P/E ratio can act on the stock price. His conclusion is that ROE's effect is significant enough, while the other two's effects are not significant enough [15].

2.3. Innovation

Instead of studying merely three independent variables, the researcher studies 9 independent variables. In this way, he can avoid some problem of Omitted Variable Bias, and reduce some possible correlation within an independent variable. For example, for current ratio part, the denominator is current liabilities, which is the same as the denominator of quick ratio. If the researcher only regresses quick ratio, the impact of the current ratio might have some impact on the outcome of the quick ratio. Therefore, regressing as many related independent variables on dependent variable as possible will make the experiment more accurate. Besides, the aim of this research is to determine whether the correlation exists but not to quantify the correlation, which makes the research more reliable.

3. Method

In this research, there are 30 companies, with 9 different ratios in 5 years (from 2017-2021) and 5-year-stock-price, totally 1500 coefficients. Instead of simply regress these 9 ratios on stock price, to better get the effect itself, the researcher first calculates the growth rate of these 9 ratios between 2017 and 2018, 2018 and 2019, 2019 and 2020, and 2020 and 2021, and the 4 growth rates of average annually stock price between these 4-time period. Then there are ten parameters for regression: 1. Change in EPS (CIE), 2. Change in ROE (CIRE), 3. Change in ROA (CIRA), 4. Change in sales growth (CIS), 5. Change in P/E (CIP), 6. Change in current ratio (CIC), 7. Change in gross profit margin (CIGPM), 8. Change in quick ratio (CIQ), 9. Change in asset turnover (CIA), and 10. Change in stock price (CISP). For example, for Amazon's 2017-2018, CIE = CIE of Amazon in 2017-2018, ROE = ROE of Amazon in 2017-2018, …, and CISP = CISP of Amazon in 2017-2018. And they are all on the same row. For the next row, there will be Amazon's data from 2018-2019. In this case, all of the previously 1500 data will be connected as 120 row, 10 column data set, which can help better regress. Here, the change in independent variables and the change in dependent variables are clearly shown and analyzed.

Then the independent variable will be CIE, CIRE, CIRA, CIS, CIP, CIC, CIGPM, CIQ, CIA, and the dependent variable will be CISP.

The regression technique of this research is multivariate regression, And the regression equation can be concluded as the following:

CISP = a * CIE + b * CIRE + c * CIRA + d * CIS + e * CIP + f * CIC + g * CIGPM + h * CIQ + i * CIA + e

a ~ i: multivariate regression coefficients after regression

e: error term

4. Results

So, after the regression, the result is the following:

Table 1. Results of Residuals:

Min	1Q	Median	3Q	Max
-0.8092	-0.2596	-0.0456	0.1403	4.8026

Table 2. Results of Coefficients:

Item	Estimate Std.	Error	t value	Pr(>|t|)
(Intercept)	3.074e-01	5.728e-02	5.367	4.49e-07 ***
changeinEPS	2.998e-03	2.260e-02	0.133	0.89470
changeROE	-2.013e-04	3.300e-04	-0.610	0.54320
changeROA	4.497e-03	4.185e-02	0.107	0.91463
changesalegrowth	3.292e-03	2.723e-03	1.209	0.22935
changePE	5.152e-02	8.513e-03	6.051	2.03e-08 ***
changecurrentratio	-1.371e-02	2.053e-02	-0.668	0.50579
changegrossprofitmargin	-4.086e-02	1.430e-02	-2.857	0.00512 **
changequickratio	1.962e-06	5.394e-03	0.000	0.99971
changeassetturnout	-4.674e-04	6.079e-03	-0.077	0.93884

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5957 on 110 degrees of freedom

Multiple R-squared: 0.2701, Adjusted R-squared: 0.2104

F-statistic: 4.523 on 9 and 110 DF, p-value: 4.479e-05

The statistical test is conducted through the hypothesis test. This hypothesis test shows how significantly the independent variable (CIE, CIRE, CIRA, CIS, CIP, CIC, CIGPM, CIQ, CIA) could impact the dependent variable (CISP). And the ratio under the estimate shows how a certain independent variable will influence the dependent variable while holding other independent variables constant. The process of the hypothesis test is that:

H0 =

there is no influence CIE can act on the CISP, knowing other independent variables

there is no influence CIRE can act on the CISP, knowing other independent variables

there is no influence CIRA can act on the CISP, knowing other independent variables

there is no influence CIS can act on the CISP, knowing other independent variables

there is no influence CIP can act on the CISP, knowing other independent variables

there is no influence CIC can act on the CISP, knowing other independent variables

there is no influence CIPM can act on the CISP, knowing other independent variables

there is no influence CIQ can act on the CISP, knowing other independent variables

there is no influence CIA can act on the CISP, knowing other independent variables

H1 = There is influence every independent variable each has an influence on CISP given other independent variables.

The testing criteria for the significance level is to compare the Pr(>|t|) to 0.05. If the coefficient is less than 0.05, that means that certain variable is significant enough to make a conclusion that it has an impact on CISP because the possibility that they will have a correlation will be 1 - 0.05 = 0.95, which is very large so that the conclusion can be drawn.

Looking at the regression outcome generated from computer, the research shows that it is significant enough to conclude that CIP and CIGPM have influence on CISP. The possibility that CIP has influence on CISP is 1 - 2.03 * e8, and the possibility that CIGPM has influence on CISP is 99.488%. Both is high enough to reject the null hypothesis. But despite these two variables, other 7 independent variables have no evidence significant enough to prove their impact on the CISP.

The coefficient after regression for CIP is 5.152 * e-2, showing that with one unit increase in P/E ratio while holding other independent variables constant, the stock price will be expected to increase by 5.152 * e-2.

The coefficient after regression for CIGPM is -4.086 * e-2, showing that that with one unit increase in Gross Profit Margin while holding other independent variables constant, the stock price will be expected to decrease by 4.086 * e-2.

5. Conclusions

In this experiment, the researcher of this thesis uses standard deviation to regress the correlation between ratio test and stock price and concluded that the correlation between Price to Earnings ratio and stock price, and the correlation between gross profit margin and stock price are significant enough to be stated that both price to earnings ratio and stock price have a relationship with stock price. Quantitatively, one unit increase in P/E ratio while holding other independent variables constant, the stock price will be expected to increase by 5.152 * e-2, and one unit increase in Gross Profit Margin while holding other independent variables constant, the stock price will be expected to decrease by 4.086 * e-2. The correlations between these two and stock price have been proved to be significant in the experiment using alpha-level = 0.05. The possible logic behind this correlation will be the following. The P/E ratio represents the income of the company that is ready for sharing to the shareholders. Therefore, it is logically correct that if the shareholder knows they will have more income to be distributed, they are more likely to have a higher expected return in their investment; therefore, increasing their

expected price of the stock, and increasing the stock price. The gross profit margin remaining percentage of the sale if company has paid for its goods. The possible negative relationship might be caused by the fact that the stock buyers might be more focused on the previous financial condition instead of the upcoming growth of the sales. As mentioned before, the purpose is to validate the existence of the correlation so that it is better to conclude that the correlation between P/E and stock price and the correlation between gross profit margin and stock price are significant enough to be concluded. This also reflects that the price of the stock can have a correlation to the shareholders' behavior and reaction to the market.

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