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Efficiency of Financial Ratios in Predicting Stock Price Trends of Listed Banks at Nairobi Securities Exchange

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Abstract. In this paper, we examined financial ratios and their effects in predicting stock price trends of listed banks at Nairobi Securities Exchange for the period 2019. Valuation and Profitability ratios are used to measure the value of firms and to investigate whether financial ratios have an effect on Stock Prices of the firms or not. This is investigated using multiple linear regression analysis step-wise method with P/E ratio, P/CF ratio, P/S ratio, P/B ratio, Return on Equity and Dividend Yield as the independent variables and stock prices of the firms as the dependent variables. The results of this study show that all the six financial ratios have a significant effect on stock prices. Besides, price-to-earning ratio, price-to-cash flow ratio, price-to-book ratio and return on equity have a higher correlation with stock price of the firms than other ratios. On the basis of these findings, the study concludes that I & M Holdings limited qualifies to perform better as an undervalue company in the year 2019 and companies need to pay more attention on financial ratios, and that there is increasing need for a more credible and comprehensive disclosure of financial ratios in the annual reports of firms.

1. Introduction

A financial market brings buyers and sellers together to trade in financial assets such as stocks, bonds, commodities and currencies. The two most common financial markets are capital markets and money markets. A financial market is a market where buyers and sellers engage in trade of

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financial securities, especially bonds and stocks (Levinson et al., 2014). The main aim of financial reporting and analysis is to provide accurate information about the financial position and performance of companies provided by numbers disclosed in financial statements which was considered to be a proper guide for good decision-making. The users of financial information rely on more than any other data from financial statements, in order to evaluate companies and forecast the profitability, cash flow, equity growth, sales, book value, dividend of corporate economic and subsequent decisions. In financial markets, the numbers reported from financial statements influences investors confidence. Investors look for opportunities to invest their additional resources in the most efficient companies, and their attention lies more on stock price values in making decisions.

It is well known that financial ratios are the simplest and oldest tools used in evaluating and planning performance of companies. They surfaced in the mid-nineteenth century, and it has and still been used by financial analysts in making economic decisions; including comparing companies performance, and investment. Therefore, financial ratios still kept their classical and fundamental power as models for financial and planning analysis. One of the importance of using financial ratios instead of the amounts on the income statement is that, it is independent of the size of the company. Based on their qualities, researchers have been studying financial ratios widely for almost a century in assessing companies financial conditions, attractiveness and operations as an investment. Mostly, financial ratios are presented as a quantified metric in the form of a multiple or percentage aiming to evaluate the financial, operational and companies competitiveness (Arkan et al., 2016). In recent years, financial ratios are combined with statistical techniques to know the impact of correlation between ratios and stock prices. The technique involves the calculation of a number of ratio indicators and test the ratio with stock prices which attempts to express the relationship which exist between key financial variables appearing in the published financial statements.

2. Literature Review

The stock market is still an integral part of any economy for developmental purposes. If there are variations in the stock market, it influences the health of any economy, personal and corporate financial lives. It is risky to invest in stock markets as stock prices are difficult to forecast if proper and rational decisions are not taken into consideration. Therefore, smart and reliable models are needed in predicting stock price movements in stock markets for proper decision-making and profitable opportunities. The problems for stock market volatility, seasonality, and time dependence, the rest of the market, and economies have been a struggle that induced researchers both in academia and industries. (Chen and Shimerda, 1981) provided a new test of the predictive ability of aggregate financial ratios in their research. The predictive regressions are conditional to small-sample biases, but the correction in previous studies can greatly downplay forecasting power.

Dividend yield predicts aggregate market returns from 1946 – 2000, as well as in various periods. Book-to-market and the earnings-price ratio predicted returns during the shorter 1963 – 2000 sample. The evidence remains strong despite the unusual price run-up in recent years. (Marsha and Murtaqi, 2017) examines the use of financial ratios and its impact on firm value of 14 Indonesia firms in the Food and Beverages sector for period of 2010-2014 in their research. Besides, Tobin Q Ratio has been used as a measure for firm value to investigate whether financial ratios has effect on firm value or not. They investigated this using multiple regression analysis to know the impact of independent variables explaining the dependent variables. The result of this study shows that all the three financial ratios have a significant effect to firm value. They concluded that, companies need to focus more on financial ratios and that there is increasing need for a more credible and comprehensive disclosure of financial ratios in the annual reports of firms.

Rashid 2018, research mainly focused on the evaluation of the companies' liquidity using financial ratios analysis. They selected one of the UK retail company to be evaluated through analyzing their data which is available on their financial statements. For evaluating liquidity, cash flow statement of this company has been considered. A hypothesis has been developed in their research, in which financial ratios analysis can be helpful for investors to choose the company for purchasing their shares, and it is approved because the numbers indicated that liquidity is important as much as profit for attracting investors to purchase the company's share owing to providing confidentiality for the company. It is well known that the performance of the stock market or factors that move stock prices are technical factors, fundamental factors and market sentiments.(Jallow et.al., 2021) research focuses on applying both stochastic models and statistical techniques on stock prices of firms in predicting the long-term behavior of the stock value prices. Their results showed that, from the long run probabilities, the probability of stock prices fluctuating is higher than it been stable. Consequently, there is a high likelihood that stock prices will not be stable but will keep on fluctuating. From this analysis, financial ratios and its effects are key components to be considered when predicting stock price trends of firms.

According to (Ligocká, Stavárek et al., 2019), stock prices can be influenced by many factors. Their paper focuses more on micro-economic factors that affect stock prices, especially financial ratios that reflect business activities of the companies. The objective of their paper is to examine the relationship between selected financial ratios and the stock prices of food companies listed on selected European Stock Exchanges. Time series on annual frequency are used to examine the relationship between stock prices of selected companies and financial ratios using the Generalized Method of Moments (GMM). Based on previous research, they were able to find some correlations between stock prices and the profitability ratios. According to (Meriç, Kamışlı and Temizel, 2017),

One of the Significant variables for investors is the price of stocks and the variables that affect stock prices. The purpose of their study is to analyze the relationships between stock price, price-earnings ratio and dividend yield ratio of the companies that are listed at BIST Banking sub-sector. In this context, in line with the aim of the study monthly price, price-earnings ratio and dividend yield ratio of VAKBN; ISCTR; HALKB; GARAN; AKBNK stocks between 2008M10-2017M3 will be analyzed by VAR methodology. The results of their study showed that the relationships between the above mentioned variables changes in size and direction from bank to bank.

3. Methodology

It is known that financial ratios are the oldest and simplest practical tools use in evaluating and planning companies' performance. However, financial ratios still kept their classical and fundamental power as models or another important supportive tool for financial and planning analysis. The main advantage of using financial ratios instead of amounts from the income statement is that they are independent of the size of the company. Financial ratios are used to assess companies' financial conditions, operations and attractiveness as an investment. Based on their characteristics, academicians have already been studying financial ratios widely for almost a century. Typically, they are presented as a quantified metric in the form of a percentage, multiple or a ratio which aims to evaluate the financial, operational performance and competitiveness of a company. We are to determine the stock value price trend of listed banks at Nairobi Security Exchange using financial valuation ratios. Valuation ratios are prominent tools that are use to assess the financial strength of companies before investors either buy or sell shares from these companies. Stocks are regarded as a long-term source of funding because they give the holder the right to receive profit in the case of an entity to achieve profits or bear the loss. In financial markets, stocks are the most actively and common traded securities (Arkan et al., 2016).

3.1. **Price-to-Earning Ratio.** Price-to-earning ratio is the ratio for valuing a company that measures its current share price relative to its earning per-share. P/E ratios are important fundamental factors that are use by investors and analyst to determine the relative value of a company's share. It can also be use to compare aggregate markets against one another or a company against its own historical record. Besides, dividing a company's share price by its earnings per share, investors can have a gist of the value of a stock in terms of how much the market is willing to pay for each dollar of earnings.

$$P/E \quad Ratio = \frac{Market \quad value \quad per \quad share}{Earnings \quad per \quad share} \tag{1}$$

The earning per-share is calculated as the company's profit per unit of the outstanding shares of the common stock.

$$Earnings \quad per \quad share = \frac{Earnings}{Common \quad outstanding \quad shares} \tag{2}$$

The higher the earning per share of a company, the more profitable it is, and vice versa, as from the resulting number serving as an indicator of a company's profitability. Since a higher EPS indicates a greater value, investors will want to pay for more of a company's shares if they think the company has higher profits relative to its share price. Earning per-share indicates how much money a company makes for each share of its stock, and it is a widely used metric to estimate corporate value. The earning per-share metric is a very important variable use in determining a share price and vital in calculating price-to-earning valuation ratio.

3.2. **Price-to-Cash Flow Ratio.** Price-to-cash flow ratio is a valuation metric or multiple that measures the value of a company's stock price per share relative to its operating cash flow per share (or compares the company's market value to its operating cash flow). Essentially, the ratio measures the current price of the company's stock relative to the amount of cash generated by the company. It is employed to determine how much investors are willing to pay for each dollar of cash flow generated by the business. The capacity at which a company generate its cash flow is a strong indication or reflection of its profitability. A company will be valued at higher multiple if it has the ability to produce a significant amount of cash flow over time than a company that barely covers for its capital expenditures. Thus, companies that had been able to produce consistently positive cash flow in the past, we can rely on that to predict the future price per share based on the cash flow pattern. The price-to-cash flow ratio involves two methods of calculation. The multiple can be calculated using the company's market capitalization. Then the price-to-cash flow formula is;

$$P/CF \quad Ratio = \frac{Market \quad capitalization}{Operating \quad cash \quad flow} \tag{3}$$

Also, the price-to-cash flow ratio on per-share basis is;

$$P/CF \quad Ratio = \frac{Share \quad price}{Operating \quad cash \quad flow \quad per \quad share} \tag{4}$$

3.3. **Price-to-Sales Ratio.** Price to sales ratio utilizes a company's market capitalization and revenue to determine whether the stock is valued properly. It shows how much the market values every dollar of a company's sales. The ratio can be effective and efficient in valuing growth stocks that have suffered a temporary setback or yet to turn a profit. It can be used for double-checking that a company's growth has not become overvalued or spotting recovery situations. The price-to-sales ratio does not account for the debt on a company's balance sheet. A company with no debt and a low P/S metric is a more attractive investment than a company with high debt and the same P/S. It is calculated by taking a company's market capitalization (the number of outstanding shares multiplied by the share price) and divided by the company's total sales or revenue over the past 12 months. Besides, the lower the P/S ratio, the more attractive the investment and vice versa.

$$P/S \quad Ratio = \frac{Share \quad price}{Total \quad sales} \tag{5}$$

3.4. **Price-to-Book Ratio.** Price-to-book ratio is the ratio of the market value of a company's share (share price) over its book value of equity. The book value is the difference between the book value of assets and the book value of liabilities. A price-to-book value of one means that the stock price is trading in line with the book value of the company. From the P/B standpoint, the stock price would be considered fairly valued. Thus, a company with a high price-to-book ratio or a lower price-to-book ratio could mean the stock price is overvalued or undervalued respectively. If the stock price is undervalued, it means the stock price is trading at a lower price relative to the value of the company's assets. A low P/B ratio could also mean the company is earning a very poor (even negative) return on its assets. A P/B ratio that is greater than one means the stock price is trading at a premium to the company's book value. A company with a high share price alongside its asset value could also mean the company is earning a high return on its assets. Besides, investors use price-to-book value to gauge whether a stock is valued properly or not. Since the ratio is higher for some industries than others, it is paramount to compare it with companies with the same makeup of assets and liabilities or within the same sector. To determine a company's book value, we need to look at its balance sheet.

$$Book \quad value = Asset - Liabilities \tag{6}$$

We need to divide the company's book value by the number of outstanding shares in order to find the book value on a per-share basis so that we can compare it with the current share price.

$$Book \quad value \quad per \quad share = \frac{Book \quad value}{Outstanding \quad shares} \tag{7}$$

We have to divide the company's current stock price by the book value per share as;

$$P/B \quad Ratio = \frac{Share \quad price}{Book \quad value \quad per \quad share} \tag{8}$$

3.5. **Return on Equity.** Return on equity is a profitability ratio that measures the ability of a firm to generate profits from its shareholders' investment in the company. This ratio calculates how much money is made based on the investors' investment in the company, not the company's investment in assets or something else. It means, return on equity shows how much profit each dollar of common stockholders' equity earns. Thus, a return on one will mean that every dollar of common stockholders' equity will generate one dollar of net income. ROE is a very important measurement tool for potential investors because it helps them know how much efficient a company will invest their money to generate more income. Return on equity is also a good indicator of how effective management is at using equity financing to fund operations and grow the company.

The formula for return on equity is calculated by dividing net income per shareholder's equity as;

$$Return \quad on \quad Equity = \frac{Net \quad income}{Shareholder's \quad equity} \tag{9}$$

Higher return on equity is almost always better than when it is lower, but they have to be compared to other companies' ratios in the same industry. Since every industry has different levels of investors and income, ROE cannot be used to compare companies outside their industries very effectively. To help track of a company's progress and ability to maintain a positive earnings trend, most of the investors choose to calculate the return on equity at both the beginning and end of a period to see the changes in returns.

3.6. **Dividend Yield.** Dividend yield is a financial ratio that shows how much a company pays out in dividend each year relative to its stock price. It is an estimate of the dividend-only return of a stock investment. Dividend yield changes relative to the stock price. It means, the dividend yield will rise when the stock price falls and vice versa. It is vital for investors to keep in mind that higher dividend yields do not always indicate attractive investment opportunities because the dividend yield of a stock may be elevated as the result of a declining stock price. The dividend yield formula is;

$$Dividend \quad Yield = \frac{Dividend \quad per \quad share}{Market \quad value \quad per \quad share} \tag{10}$$

Meanwhile, dividend per share is the company's total annual dividend payment divided by the total number of shares outstanding and market value per share is the current share price of the company. The formula above is used to determine the cash flows that are attributed to an investor from owning shares or stocks in a company. Thus, the ratio shows the percentage of dividends for every dollar of stock. Having either a high or low yield depends on the factors such as the business life cycle of the company and the industry. It means, a fast growing company might have the interest of not paying dividend to shareholders in order to reinvest in the company for growth. A mature company that lacks future high growth potential might report high yield. Therefore, the yield ratio does not necessarily indicate a good or bad company. Rather, the ratio is used by investors to determine which stocks align with their investment strategy.

4. Results

4.1. **Analysis of Financial ratios.**

The price-to-earning ratio is used to determine the relative value of a company's share or compare companies against one another. The lower the P/E ratio the better it is and vice-versa. The financial ratios from 1 revealed that, the individual firms, NCBA Group Plc, I & M Holdings Ltd and HF Group Ltd has a smaller P/E ratio compared to the rest of the individual firms. These three firms are undervalued and might indicate that the current stock price is low relative to earnings.

For the rest of the firms with high P/E ratio shows that investors are wiling to pay a higher share price today because of growth expectations in the future. Moreover, interest rate and inflation influences price-to-earning ratio. The higher the interest rate inflation rate, the lesser the price-to-earning ratio and vice versa. The interest rate and inflation in the Kenyan economy set by the Central Bank of Kenya in the year 2019 was 8.50% and 5.2% respectively. When both interest rates and inflation are low, there is a high chance for higher real earnings growth, increasing the amount people will pay for a company's earnings. Thus, the more people are willing to pay, the higher the P/E. The higher the inflation rate, the more investors expectations rise about high market returns. Conversely, the lower the inflation rate, investors have lower expectations about high market returns. The P/E ratio falls if investors demand a higher rate of return. When an investor pays a lower P/E, he or she is paying less for more earnings and, as earnings grow, the return investors achieve is higher. In periods of low inflation, the return demanded by investors is lower and the P/E gets higher. The higher the P/E, the higher the price for earnings, which lowers investors expectations of healthy returns.

Financial Ratios for the listed Banks at Nairobi Securities Exchange						
BANKS	**P/E Ratio**	**P/CF Ratio**	**P/S Ratio**	**P/B Ratio**	**ROE**	**Dividend Yield**
Absa Bank kenya PLC	9.74	7.03	4.3	1.6	18.4	8.24
Stanbic Holdings PLC	6.8	4.83	2.85	0.88	13.6	6.45
HF Group Ltd	5.53	6.68	7.83	1.89	10.13	11.28
NCBA GROUP PLC	4.25	7.21	10.18	1.98	16.1	16.1
The Co-operative Bank of Kenya Ltd	6.59	4.78	2.98	1.17	19.2	6.12
I & M Holdings Ltd	4.3	3.26	2.22	1.18	19.5	4.72
KCB Group Ltd	6.66	4.88	3.09	1.31	3.89	6.48
Standard Chartered Bank Ltd	8.62	6.69	4.75	2.82	17.5	6.03
BK Group PLC	8.75	6.59	4.42	2.25	4.55	6.85
Diamond Trust Bank Kenya Ltd	8.57	6.31	4.06	1.80	3.47	5.13
Equity Group Holdings	9.02	6.62	4.22	1.82	21.9	4.67
National Bank of Kenya Ltd	8.2	8.42	8.64	1.86	9.08	9.3

TABLE 1. Financial ratios for the listed Banks at Nairobi Securities Exchange

Source: (https://www.marketscreener.com stock financials, 2019)

The price-to-cash flow ratio will be measuring the current price of each of the company's stock relative to the amount of cash generated by the company. Among all the banks listed at Nairobi

Securities Exchange, the one with lower price-to-cash flow ratio is I & M Holdings Ltd, The co-operative Bank of Kenya Ltd, Stanbic Holdings PLC and KCB Group Ltd. The rest have a higher P/CF ratio. Besides, the lower P/CF ratio is showing that investors are willing to pay less for each dollar of cash flow generated by the business and vice versa. Interest rate has an effect on cash flow of companies. When interest rate is high, it leads to limited cash flow of small companies, especially in terms of acquiring loans. Investors may delay paying their receivables, put off expansion and investment plans, which slows down the growth of the companies. High interest rates in the banking sector can change customers spending habits, thereby reducing cash flow. Individuals will have less disposable income to buy goods and services when they have to pay high interest on personal loans, including mortgages and auto loans. Thus, high interest rates are not always bad for stronger companies as it give them advantages over growing ones, and making it more attractive for both businesses and consumers to save excess cash than spending it. Moreover, inflation reduces the inflow and outflow of cash as cost increases leading to high expenses in labor, finished goods and inventories. As the sales prices are eventually increase, it causes trade receivables to rise, and as a result, the working capital of companies increases too. Inflation acts as a fuel reducing liquidity of cash and helps in the generation of cash flow deficiency. Price-to-sales ratio uses a company's market capitalization and revenue to determine whether the stock is properly valued. Banks with the lowest P/S ratio are; I & M Holdings Ltd, Stanbic Holdings PLC, The Co-operative Bank of Kenya and KCB Group Ltd. The other banks have a higher P/S ratio. If the P/S ratio is lower than comparable companies in the same industry that is profitable, investors might consider buying the stock due to the low valuation. All things being equal, a low P/S ratio is good news for investors, while a very high P/S can be a warning sign. Price-to-book ratio is used to compare each of the firms market capitalization to its book value. It is only Stanbic Holdings PLC which has a P/B ratio less than one. It means Stanbic Holdings PLC's stock price is undervalued. Besides, the rest of the other banks have a P/B ratio more than one, so their stock prices are overvalued and will be trading at a premium to the company's book value.

Return on equity is use to measure the ability of each of the firms to generate profits from its shareholders' investment in the company. The higher the return on equity, the better the investment. The firms with the highest return on equity among all the banks listed at Nairobi securities exchange are: Equity Group Holding, I & M Holding, The Co-operative Bank of Kenya Ltd, Absa Bank Kenya PLC, Standard Chartered Bank Ltd and NCBA Group PLC. The rest of the other firms are below the Industry mean average return on equity. Dividend yield is use to show how much each of the firms pays out dividend each year relative to its stock price. The industrial average dividend yield for the banking sector is 4 to 6. Among all the banks listed at Nairobi Securities Exchange, it is only Equity Group Holding, I & M Holdings Ltd and Diamond Trust

Bank within the range of the industrial mean average of the dividend yield. The rest are all above the banking industry mean dividend yield. Thus, the dividend yield and the stock price are inversely proportional to each other. The higher the dividend yield, the lower the stock price. Higher interest rates do not only erode the value investors place on the yield of equities, but it directly affects the yield itself; a rise in interest rate can catapult the cost of companies, by reducing their earnings and cash flow, all of which can influence their ability to pay out dividend yield to shareholders.

Correlation analysis between dependent and independent variables for the banking sector			
RATIOS	***r***	r^2	***Sig***
P/E Ratio	0.934	87.2	0.00
P/CF Ratio	0.733	53.7	0.003
P/S Ratio	0.661	43.6	0.010
P/B Ratio	0.792	62.8	0.001
Return on Equity	0.997	99.4	0.00
Dividend Yield	0.682	46.6	0.007

TABLE 2. Correlation Analysis

Correlation statistically significant at 5%

Source: Research findings (*R and SPSS*)

From the correlation analysis 2, there is a statistically significant positive relationship between price-to-earning ratio and stock price, where Sig(0.00) is less than the confidence degree at (0.05). The R^2(87.2) means that the independent variable was able to explain only 87.2% from the behavior of the dependent variable and (12.8%) of the stock trend is affected by other variables. Thus, there is a significant positive relationship between price-to-cash flow ratio and stock price at R(0.733) and Sig(0.003), where R^2(53.7) explains a wide range of stock trends but 46.3% of the stock trend was affected by other variables. There is also a positive significant relationship between price-to-sales ratio and stock price where Sig(0.010) is less than the confidence degree of 5% at R(0.661). Besides, the variable was able to explain 43.6% of the stock price behavior in the market. Besides, there is also a significant positive relationship between price-to-book ratio and stock price where the variable was able to explain 62.8% of the stock price behavior in the market. Also, there are positive significant relationships between the profitability ratios (return on equity and dividend yield) and stock price trends, approved by a degree of calculated significant compared with the degree of confidence. Both returns on equity and dividend yield have an R^2 of 99.4% and 46.6% respectively, explaining the stock price trends in the market.

However, using SPSS and R Software with stepwise method, it shows only independent significant ratios that have an effect on the stock price trend in the multiple regression model in order to

get an equation that will represent the relationship between independent and dependent variables. Thus, the results showed that, price-to-earning ratio, price-to-cash flow ratio, price-to-book ratio and return on equity have a strong correlation with stock price at $R(0.948)$ and $R^2(89.8)$ with the variance analysis of regression of the $F(615.853)$ and Sig(0.000), referring to a positive significant relation between stock price and the dependent variables as ratios. The T-test shows values of $\{(8.253), (3.408), (4.109) \quad \text{and} \quad (40.072)\}$ for constants $x_1, x_2, x_3 \quad \text{and} \quad x_4$ respectively. Therefore, the estimated model to determine stock value for the banking sector is:

Estimated stock price value$= -.542 + 1.196x_1 + .781x_2 + .844x_3 + .953x_4$,

where;

x_1-price-to-earning ratio

x_2-price-to-cash flow ratio

x_3-price-to-book ratio

x_4-return on equity.

5. Conclusion

To perform a good and accurate financial analysis by either an investor or analyst in their desired way for better decision-making, it needs the presence of multiple criteria to measure the performance of a company by comparing its results by others in the same industry of operation. The results presented from the analysis of the financial ratios above, revealed that I & M Holdings Limited qualifies to perform better as an undervalue company, in the year 2019, even been affected by both interest rate and inflation, according to their financial ratios' in comparison to other companies in the banking sector that are listed at Nairobi Securities Exchange. The results presented from 2, correlation table, also revealed that the financial ratios combined with statistical methods shows that the valuation ratios and the profitability ratios have a significant effect on stock prices. Thus, in the banking sector for the listed banks at Nairobi Securities Exchange, the power ability for the financial ratios to forecast stock price trends was tested using multiple linear regression, step-wise method, statistical analysis for the year 2019. There were six(6) financial ratios that were tasted, and the test results showed that only price-to-earning ratio, price-to cash flow ratio, price-to-book ratio and return on equity have a strong correlation with stock price and can identify the model to forecast the price of share values of the banking sector.

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