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Technical Analysis and Value Investment in the Indonesia Stock Market

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Abstract

This study will aim to investigate whether value investment (using buy and hold strategy by sorting portfolio based on the BM ratio) can generate excess returns in Indonesia and explore whether this value investment when combined with technical analysis (moving average indicator), can further increase the investment value in Indonesia Stock Exchange. The sample in this study includes all companies listed on the Indonesia Stock Exchange, except financial companies, for 2016 to 2021. The data obtained are analyzed using descriptive statistics, and the comparison results will see the effect of risk analyzed using regression. The analysis results show that there is no value investing effect based on the BM ratio on the Indonesian stock market. However, when the BM decile portfolio is traded with the MA (20) timing, the return of each portfolio increases compared to the trading of the BM decile strategy and shows the MA (20) strategy outperforms the buy-and-hold strategy. It was also found that this result was influenced by risk factors for each portfolio using the Fama French three-factor model.

Keywords
technical analysis; value investment; return; risk

I. Introduction

There are two tools that help investors make decisions about what shares to buy and when to buy those shares. These tools are fundamental analysis (value investing) and technical analysis. Fundamental analysis is an analytical tool that uses a company's financial statements or growth to evaluate the value of a stock. While technical analysis is another analytical tool that uses trends and price patterns to detect buy and sell signals. Technical analysis is usually used for short to medium-term trading. Fundamental and technical analysis are often thought of as two sets of investment strategies that should not intersect. The main reason is that these two techniques are substantially different from different perspectives.

The value premium is the excess return of shares with a high book-to-market (BM) ratio over a low book-to-market (BM) ratio. Several studies have verified the effect of value premium, like Fama and French (1992) that linking the value premium with the risk of financial distress from companies with high BM ratios. Another theory from Daniel and Titman (1999) claims that overreacting investors will lower prices on distressed firms, which leads to higher returns from high book-to-market stocks.

Technical analysis uses past data to forecast future market movements or, in other words, uses stock price evaluation methods by analyzing statistics generated by market activity such as volume, open interest, past prices, and various other indicators. For example, Du and Wong (2018) found that SMA significantly outperformed the buy and hold strategy on the Singapore Straits Times Index. Technical Analysis has several

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indicators in its calculations, and one of them is the moving average (MA). In addition, many technicians believe that technical analysis can save investors from extreme losses if the market is in a severe bearish condition, such as the housing crisis in 2008 or during the COVID-19 in 2020 that just occurred. For example, during the housing crisis in 2008, Niroomand et al. (2020), in their research said that an investor would lose 51.3% by following a buy and hold strategy, but the same investor would only lose 14.3% by following trading rules using moving averages recommended by their research.

Lam et al. (2019) used a sample period of 1995 to 2015 to evaluate a new trading technique that combined the influence of value premium and technical analysis and discovered an extra return. They also did several robustness tests and discovered that even adjusting for risk and transaction costs, excess returns remained considerably positive. Based on references from Lam et al. (2019), this research will aim to see whether value investment (buy and hold strategy) can generate excess returns in Indonesia and explore whether this investment value, when combined with technical analysis (moving average indicator), can further increase the value of the investment in the Indonesian stock market, especially when the last few years in this research period the global stock market including Indonesia experienced the effects of the pandemic, so this topic should be very interesting to discuss and hope to be a contribution to future research.

II. Review of Literature

Literature review is a comprehensive review of previous research on a particular topic (Octiva, 2018; Pandiangan et al., 2022; Pandiangan, 2022). Literature review aims to develop knowledge information that has been previously researched (Octiva et al., 2021; Pandiangan et al., 2021).

Researchers and investors frequently use the book to market ratio (BM) to sort stocks into portfolio value and growth. Fama and French (1993) documented that high book-to-market ratio stock values yielded higher average returns than the low book-to-market growth stocks during July 1963 until June 1991. Davis et al. (2000) also documented a strong value premium in US average stock returns for the July 1926 until June 1963 prior to the same sample on Fama and French (1992). Similarly, Fama and French (1995) found a large average value premium in Asia Pacific, Japan, and Europe from July 1990 to December 2015, which was mostly out-of-sample.

DeBondt and Thaler (1986) and Lakonishok et al. (1993) stated that the value premium occurs because the market considers the value stock too undervalued and the growth stock too overvalued. In his research, Lakonishok et al. (1993) also say that growth stocks tend to be in more attractive industries and receive media coverage, thus making this criterion more valuable from an investor's perspective. In their research, Kahneman and Riepe (1998) found that investors use past performance to assess future performance, meaning that investors tend to avoid value stocks because they have had a poor past performance. Thus, the growth stock is more likely to be held by investors, thus causing the value stock to be below its price. When the error in pricing is corrected, the value stock has a high return, and the growth stock has a lower return. It means that financial data can provide a signal to estimate the company's performance. In summary, most studies in any period examining portfolios constructed from BM ratios found evidence for a value anomaly.

In conducting technical analysis, tools such as indicators are needed to facilitate the analysis process and assist in decision making. These indicators are later useful to provide information about trends, volume, and other information, which can predict price

movements. This study will use moving average (MA), the most frequent indicator that investors use. MA uses stock price movement data in a formula whose results are later displayed as a line on the chart. This line will be used to detect the trend of stock price movements, which gives a signal of a trend or as confirmation that the current trend will be a reversal. This technique makes calculations that use the arithmetic average of a specific set of prices over a specific period in the past, for example, over the previous 15, 20, 30, 100, or 200 days. Investors can choose different periods based on their purpose of investing or trading. Moving averages with shorter periods are usually used for short-term trading, while long-term investors usually use long-term moving averages. The moving average graph that goes up shows that the stock or security is in an uptrend, which means that there will be an increase in price and momentum, while a decreasing moving average indicates that it is in a downtrend or indicates that the price is declining. In their research, Zhu et al. (2008) define MA as an indicator that shows that investors buy shares when the current price is above the average price during a certain predetermined period.

Research by Cheung et al. (2011) conducted research in the period 1972 to 2006 on the Hong Kong stock exchange using a simple moving average (SMA) and trading range break (TRB). Their research shows that the use of technical analysis before 1986 led to excess returns in the Hong Kong market even though there was a sales commission. After 1986, excess returns seem to have disappeared, apparently due to the integration the market experienced, leading to stronger efficiencies as a result of increased information dissemination. Metghalchi et al. (2021) conducted a study to look at stock movements in Africa using technical analysis and found that the SMA indicator can predict price movements equally and outperform the buy and hold strategy.

According to Ko et al. (2014), investors can outperform the buy-and-hold (BH) strategy by using technical analysis to determine market timing. Their research demonstrates that using a moving average technique to arrange a portfolio of TWSE equities by the BM ratio can provide higher returns than using a BH method. Then, based on trading signals issued by MA, their research proposes a Portfolio built by buying the highest BM Portfolio and selling the lowest BM Portfolio, and shows that this new investment strategy can generate significant positive returns, even though it is further verified and consolidated by expanding the study, empirical data with different currencies, alternative gap lengths, transaction costs, subperiod analysis, business cycles, and market cycles.

III. Research Method

The research method is a step that is owned and carried out by researchers in order to collect information or data and conduct investigations on the data that has been obtained (Asyraini et al., 2022; Pandiangan, 2015; Pandiangan et al., 2018; Tobing et al., 2018).

The study will use daily closing price data for companies listed on the Indonesia Stock Exchange (exclude financial companies) to conduct a moving average strategy. The research period means the period commencing on the effective date and ending on the earlier of completion of all research contemplated by the research plan (as may be amended from time to time by mutual agreement of the parties) (Octiva et al., 2018; Pandia et al., 2018; Pandiangan, 2018). The research period is from July 1, 2016, to June 30, 2021; the data is taken from Yahoo Finance. Because the 20-day moving average requires up to 20 days of past data, all return calculations were made from May 31, 2016. For interest rates, the study will use JIBOR and IndONIA (Indonesia Overnight Index Average) from

January 2019 because Bank Indonesia replaced the overnight JIBOR with IndONIA effective January 2, 2019. This daily interest rate data is obtained from the Bank Indonesia official website. Each company's market capitalization and book value data are taken from S&P Capital IQ to compute BM ratios.

Following Lam et al. (2019), this study considers the following strategies. From July 1, 2016, to June 30, 2017, the research will calculate each share's 2015 book-to-market (BM) ratio and then sort it by the BM ratio and assign it to a decile Portfolio. Portfolio 1 would be made up of equities with the lowest BM ratio, while Portfolio 10 would be made up of stocks with the highest BM ratio. This method will be repeated annually for the duration of the five-year research period. The total number of companies used in this study is 537, but the number of companies each year differs depending on the presence of delisting or companies that have an IPO in the research year. For example, in the 2015 research year, there were 390 companies, and they were divided into 10 portfolios, with each portfolio having 39 equally weighted companies. Then if in the second year there are 400 companies, these 400 companies will be divided into 10 portfolios and so on until the fifth year.

Following that, the research will use technical analysis with signals from the moving average indicator to analyze each BM Portfolio (not from a passive buy and hold approach). If the price index at t-1 (the previous day) is higher than the MA indicator at t-1, then the BM portfolio is bought or held. Otherwise, we protect our capital by investing in risk-free assets. The MA chosen is MA (20), which was determined to have the highest average return when compared to the 5-day, 10-day, 50-day, 100-day, and 200-day MAs in research by Lam et al. (2019). Furthermore, his research demonstrates that returns with moving average signals longer than 20 days begin to drop and become smaller, with the 100-day moving average's outcomes even becoming negative. Because the Chinese Stock Market is so volatile, his research predicts that shorter MA signals can capture information variations more precisely than longer MA signals. Signals with long lag durations may miss key information changes, resulting in modest abnormal returns. The study will then calculate the average daily return for the decile portfolio, as well as the return from a standard buy-and-hold strategy for comparison. By comparing the return of the moving average approach with the return of the buy-and-hold strategy, the researchers will be able to assess how these two methods affect the BM premium. According to the study, portfolio returns should be higher after incorporating technical analysis. As a result, by subtracting the return on the buy-and-hold strategy from the return on the moving average approach in this study, the difference between the two strategies (MAPj, t, L) will be derived. The MA time technique outperforms the buy-and-hold strategy when the return is considerably higher than zero.

IV. Result and Discussion

Table 1 shows the summary statistics of BM decile portfolio, MA (20) timing portfolio, and MAP returns observed daily for 5 years from July 2016 to June 2021. The average BM ratio for 8 Portfolios is less than one and ranges from 0.01 (portfolio 1) to 0.91 (portfolio 8), indicating that the average book value of the sample shares is smaller than the average market value of each company in the Indonesian stock market. Only portfolios 9 and 10 have an average BM ratio of more than one. Mean is the average return of each portfolio of BM Decile, MA (20), and MAP. For the BM decile portfolio, there is no pattern in the rate of return from the portfolio with the lowest BM to the portfolio with the highest BM, also all portfolios are not significant at 5%. This shows that the BM has no

effect on the stock market in Indonesia. However, when the BM decile portfolio is traded with the MA (20) timing, it can be seen that the return of each portfolio increases compared to the BM decile strategy trading with the standard deviation also decreasing, which means that the MA (20) timing strategy is a promising strategy to be carried out in the Indonesia Stock Exchange with less risk than the buy and hold strategy. However, there is still no pattern at the rate of return from the portfolio with the lowest BM to the portfolio with the highest BM in this strategy. The MAP strategy's return is significantly more than zero for all portfolios, indicating that the MA approach (20) outperforms the buy-and-hold strategy.

Table 1. Descriptive Statisctics for
BM Decile, MA (20) Timing, and MAP Ranked Portfolios

	BM Ratio	BM Decile Portfolio				MA (20) Timing Portfolio				MAP			
		Mean	Standard Deviation	Skewness	t	Mean	Standard Deviation	Skewness	t	Mean	Standard Deviation	Skewness	t
Low	0.01321	-0.00011	0.03571	0.08912	-0.1061	0.00206	0.02488	32.13488	2.93659	0.00217	0.02545	29.79977	3.01956
2	0.04081	-0.00024	0.01618	-0.19677	-0.5159	0.00151	0.01072	16.59855	5.00956	0.00175	0.01193	12.55326	5.20030
3	0.07778	0.00003	0.03696	0.98716	0.0323	0.00227	0.02653	28.65608	3.03713	0.00224	0.02555	29.11788	-1.31510
4	0.12692	0.00015	0.02501	-2.33838	0.2093	0.00195	0.01653	19.04636	4.18038	0.00180	0.01859	19.03671	3.43630
5	0.21137	-0.00001	0.02456	-12.24963	-0.0207	0.00196	0.01371	6.57076	5.07467	0.00198	0.02020	23.93017	3.46892
6	0.33615	0.00010	0.05698	3.22888	0.0652	0.00366	0.04123	26.92082	3.14872	0.00356	0.03902	21.74073	3.23179
7	0.54515	0.00010	0.03524	-3.94274	0.1047	0.00324	0.02145	12.73631	5.35100	0.00313	0.02761	14.04847	4.02458
8	0.91235	0.00048	0.06733	6.70416	0.2534	0.00462	0.05337	22.75433	3.07053	0.00414	0.04060	21.29796	3.61544
9	1.67475	0.00035	0.02970	-1.17314	0.4236	0.00341	0.02016	10.75106	5.99857	0.00306	0.02135	12.12542	5.07282
High	6.20358	-0.00010	0.05030	-20.00415	-0.0723	0.00354	0.01612	6.28664	7.79384	0.00365	0.04739	23.98314	2.72812

Table 2. Sharpe Ratio

Rank	BM Decile Portfolio	MA (20) Timing Portfolio
1 (Low)	-0.0077282	0.0760345
2	-0.0249979	0.1255259
3	-0.0036607	0.0792923
4	-0.0008552	0.1076861
5	-0.0074662	0.1308052
6	-0.0011258	0.0847111
7	-0.0018435	0.1430485
8	0.004637	0.0834384
9	0.006258	0.1608060
10 (High)	-0.0053992	0.2093448

Table 2 is the result of the sharpe ratio calculation; an indicator used to measure the performance of a portfolio by seeing how much additional investment returns are obtained for each risk taken. The higher the value of the sharpe ratio should indicate better portfolio performance than the risk. According to the ratio of BM decile portfolio above, most of the sharpe ratio values are negative, which indicates that the risk-free rate is greater than the portfolio return rate. It can also be seen that the portfolio's performance does not have a pattern. For example, portfolios 6 and 7 have approximately the same average rate of return but different standard deviations. So when we compute the sharpe ratio, these two portfolios have different ratios. There are two portfolios that have a positive sharpe ratio, portfolios eight and nine, which means that these portfolios have a higher rate of return than the risk-free rate. However, it can be seen from the sharpe ratio that the performance

of portfolio nine is better because, with this rate of return, the portfolio has a smaller level of risk.

Then when the BM decile portfolio is traded using MA (20) Timing, it can be seen that the sharpe ratio for all portfolios is positive; this means that portfolio performance will increase by using this technical analysis indicator. This finding is in line with Patari and Vilska (2014) in their research that shows that trading rules using technical analysis without considering transaction costs help design strategies that can be more profitable than buy and hold strategies. The standard deviations of the MA (20) portfolios, on the other hand, are smaller than those of the BM portfolios, implying that when the MA (20) approach is applied to the BM portfolios, we receive higher returns with lower total risks, which is a positive result. Later research will evaluate whether or not these profits (higher returns) are linked to risk exposure.

Table 3. Abnormal Return by FF3F Regression

Rank	Alpha	Beta MRP	Beta SMB	Beta HML	Adj R2	F-(Prob)
1	0.002**	-0.285	0.332	-0.103*	0.460	0.000
2	0.002***	-0.285***	0.093	-0.037*	0.249	0.000
3	-0.002**	-0.498*	-0.365	0.020*	0.417	0.000
4	0.002***	-0.320**	0.126	-0.079*	0.272	0.000
5	0.002***	-0.296	-0.027	-0.200*	0.083	0.000
6	0.004***	-0.889 ***	-0.289	-0.162*	0.101	0.000
7	0.003***	-0.392 *	-0.017	-0.258*	0.083	0.000
8	0.004***	-0.372	0.103	-0.857 **	0.502	0.000
9	0.003***	-0.433 ***	-0.225	-0.168*	0.148	0.000
10	0.004***	-0.806 **	-0.495	-1.064 ***	0.288	0.000
High - Low	0.002	-0.521	-0.827 **	-0.961 ***	0.358	0.000

Statistically Significant *** at 1%, ** at 5%, *at 10%

Table 3 shows that all regression models for portfolio 1 to portfolio 10 have a sig. that is smaller than (5%), which means that each variable of the FF3 pricing model has a simultaneous effect on MAP. This result explains that risk factors influence the difference in return. The table also shows the adjusted r-squared for each portfolio. This shows that the percentage of $MAP_{j,t,L}$ to market risk premium, SMB, and HML is 46.0%, 24.9%, 41.7%, 27.2%, 8.3%, 10.1%, 8.3%, 50.2%, 14.8%, and 28.8% sequentially from portfolio 1 to 10 and has an Adjusted R-squared of 35.8% for high-low. In other words, the variable $MAP_{j,t,L}$ can be explained or influenced by the FF3 asset pricing model by the percentage of Adjusted R square, while the rest is explained or influenced by other variables not examined. The size of the adjusted r square in this study is not more than 50.2%.

The alpha value in the regression model above ranges from 0.002 to 0.004 and is positive, except for portfolio 3, which is -0.002. This result means that each return on the MAP portfolio will have an alpha value if the independent variable is constant. A positive and significant alpha in each portfolio means that, by using the MA (20) timing strategy on the bm portfolio decile, there will be an increase in the return of each portfolio. The alpha coefficient here can also be interpreted as the portfolio's risk-adjusted return. The interpretation of the coefficients is that the average portfolio with (MA) 20 timing outperforms the buy and hold strategy in terms of returns at the rate of 0.2% to 0.4%. The alpha value in portfolios one to five (except for portfolio three) has the same value; 0.002,

meaning that there is no difference in risk-adjusted return for the five portfolios, but the alpha increases slightly to 0.004 and 0.003 starting from portfolio six and has a value that tends to be constant until the portfolio ten. This could mean that the alpha in each portfolio is not much different, meaning that the BM effect does not affect the portfolio's return. It can also be proven that at high-low, the alpha coefficient is not statistically significant at the level of 1%, 5%, and 10%, meaning that there is no difference in returns from portfolios 1 and 10.

The market risk premium coefficient is in the range of -0.889 to -0.285, and all of them are negative. Portfolios two, three, four, six, seven, nine, and ten have a market risk premium which has a significant negative effect, and the rest has no significant effect. Meanwhile, the market risk premium for portfolios one, five, and eight has no significant effect. These results indicate that the high or low level of market risk is less relevant information for this portfolio. All SMB coefficients on the portfolio do not have a significant effect. It means that the SMB coefficient is also less relevant in this portfolio, so it can be concluded that the proxy size has no effect as a risk factor that affects abnormal returns obtained from the MAP. All HML coefficients have a negative and significant effect, except for portfolio 3.

V. Conclusion

This study analyzes whether there is an effect of value investing on Indonesia's stock market and explores whether using technical analysis (moving average indicator) can further increase value investing. However, when the BM decile portfolio is traded with the MA (20) timing, it can be seen that the return of each portfolio increases compared to the BM decile strategy trading with the standard deviation also decreasing, which means that the MA (20) timing strategy is a promising strategy to be carried out in the Indonesian stock market with less risk than the buy and hold strategy. However, there is still no pattern at the rate of return from the portfolio with the lowest BM to the portfolio with the highest BM in this strategy. The MAP strategy's return is greater than zero for all portfolios, indicating that the MA approach (20) beats the buy-and-hold strategy. Using the Fama and French three-factor model, it was also discovered that risk factors influenced this conclusion for each portfolio.

The results of this study can have implications for investors. Investors can use the research results to consider deciding to use the MA (20) timing strategy to maximize the return on the stock portfolio when investing in the Indonesian stock market. Investors can also maximize returns by forming a risk-adjusted portfolio adjusted to their risk profile, but based on research, portfolios with high standard deviations produce higher returns. This research has its limitations; therefore, the suggestions that the author can give are as follows to investors who read this research for trading reference, this thesis does not provide complete trading advice and suggests applying thy own trading rules on this topic and only using this research as a reference; for further researchers, they can use data with a longer period and conduct robustness tests, for example, dividing the research into several periods, considering trading costs, and using other technical analysis indicators to see if the effect of technical analysis remains the same.

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