Investment Strategy Based on Exponential Moving Average and Count Back Line

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ABSTRACT

This paper assesses whether technical analysis can be used as an investment strategy for decision making in stock investment at Jakarta Composite Index. The investment strategy was performed from 1st October 2018 to 31st December 2018. The method used in this research is exponential moving average (EMA) and count back line (CBL) and only limited to stocks listed in IDX30 index. Firstly, implement the 5-EMA and 20-EMA and only buy the stock close above both EMA. The buy signal generated when the stock price close above both EMA and CBL confirmation. While the sell signal will be generated when the price of a stock is close below the CBL stop line. Based on this investment strategy, the number of transactions that give a positive return is 27 from the total 41 transactions. The return calculated using the geometric mean calculation is 4.12%. Using the buy and hold strategy will have a result of 0.71% lower compared to the investment strategy. Based on this investment strategy result, it indicates that technical analysis can be used as an investment strategy for stock investing in Indonesia Stock Exchange.

Keywords: Count Back Line, Exponential Moving Average, Indonesia Stock Exchange, Technical Analysis

1. INTRODUCTION

Over the last decade, capital markets became tremendously accessible to the vast majority of people. In addition, due to an internet expansion, financial markets tool has adapted to these technological changes that allowed access to many people to participate in the financial markets, Chen and James (2010). Globalization era has also brought many opportunities in expanding wider source of investment for company which have good performances and potential resources, Susi and Sri (2014). With the market capitalization of IDR 7 trillion in December 2018 and 6000% growth in the past forty years, Indonesia Stock Exchange (IDX) has become very attractive for investors. Furthermore, the sophisticated trading platforms are easier to learn and use for anyone that has basic computer literacy. This technological progress allowed individuals, even with a small amount of fund, going lowest of IDR 100,000, to become an investor of Indonesia Stock Exchange.

Two main methods to analyze financial markets hoping for the return are technical analysis and fundamental analysis. Fundamental analysis focuses on the economic forces of the supply and demand that lead prices to move (i.e. dividends, earnings, new products, research, etc.). On the other hand, the technical analysis examines the study of market

action, primarily through the study of past market data, primarily price, and volume, for the purpose of anticipating future price trends, Lo and Andrew (2010). Technical analysis is based on three premises as following: market action discounts everything, prices move in trends and history repeat itself, Murphy (1999).

Technical analysis is widely used among traders, such as active day traders, market makers, and pit traders. Modern studies show that of 95 studies, 56 concluded that technical analysis had positive results, Irwin and Park (2007). Technical analysts also widely use market calculation as their basis, some of the example are mathematical transformations of price, including up and down of the volume, and advance or decline data. These indicators are used to help assess whether security is trending, predict the direction, and continuation of a trend. such as the moving averages (MA), and look for forms such as lines of support, resistance, channels, and more obscure formations such as flags, pennants, and cup and handle patterns, count back line (CBL), relative strength index (RSI) and moving average convergence divergence (MACD).

1.1 CANDLESTICK CHART

A candlestick chart (also called Japanese candlestick charts) is a style of bar-chart used primarily to describe price movements of a security, derivative, or currency over time. Each bar represents the range of price movement over a given time interval, such as minute, hourly, daily, weekly, or even monthly. It is also most often used in technical analysis of equity and currency price patterns. Candlesticks charts are thought to have been developed in the 18th century by Japanese rice trader of financial instruments.

Candlesticks are usually composed of the body (black or white) and an upper and a lower shadow, which is represent the range between session's open and the close. This range is called the real body, while the price above and below the real body are called shadows (sometimes called candlestick wicks). The shadow illustrates the highest and lowest traded prices of a security during the time interval represented from the candlestick chart. If the security closed higher than it opened, the body is white or green, with the opening price at the bottom of the body and the closing price at the top. If the security closed lower than it opened, the body is black or red, with the opening price at the top and the closing price at the bottom. The details of the candlestick chart can be seen in the Figure 1.
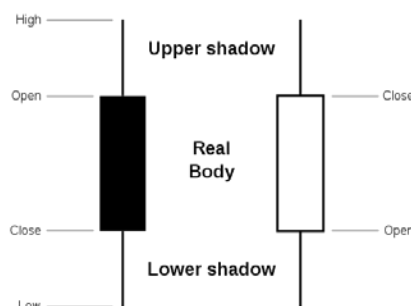

Figure 1. The basic candlestick charts

1.2 EXPONENTIAL MOVING AVERAGE

An exponential moving average (EMA) is similar to simple moving average (SMA) to measure the trend direction over a period of time. The EMA is a type of average that applies weighting factors which decrease exponentially to the past. The exponentially

smoothed average assigns a greater weight to the more recent data. Therefore, it is also a weighted moving average. It assigns lesser importance to past price data. It does include in its calculation all of the data in of the instrument. This is done by assigning a percentage value to the last day's price, which is added to a percentage of the previous day's value. Figure 2. shows the comparison of EMA and SMA with period of 20 days. Below is the formula for calculating an EMA. From the figure, the 40-EMA is more sensitive to the price movement compare to 40-SMA. For a period-based EMA, the Multiplier in the equation is equal to $2 / (1 + N)$, where N is the specific number of periods. For the first period of EMA, the simple moving average (SMA) was used as the EMA (previous).
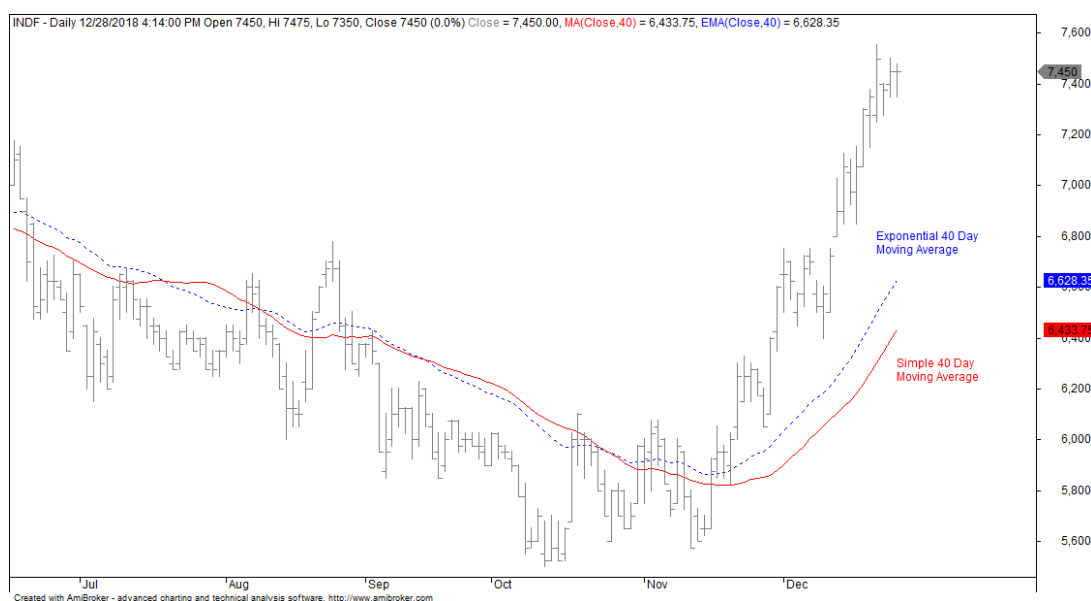

Figure 2. The comparison of EMA (dashed line) and SMA (solid line)

1.3 COUNT BACK LINE

Count back line (CBL) is a trend following tool which is designed to confirm the reversal of a short-term trend and the continuation of an existing trend. The CBL line and technique has additional uses to assist with a number of aspects of both trade entry, and trade exit. (Guppy, 2009). The count back line is used to verify the end of a downtrend. Figure 3. shows the implementation of CBL as a trend change verification tool. Using the lowest price as a base price and counting back two higher high, a price point is determined as a count-back entry line. Count back line can also be used as a stop loss tool. As part of calculation a stop loss, the count back line is applied to the highest high in the new trend and counting back two lower lows, a price point is determined that can be used as the Stop Loss (SL) level for future price action. Figure 4. shows the implementation of the Count Back Line as the stop loss position, when there is a higher low chart in the previous day.
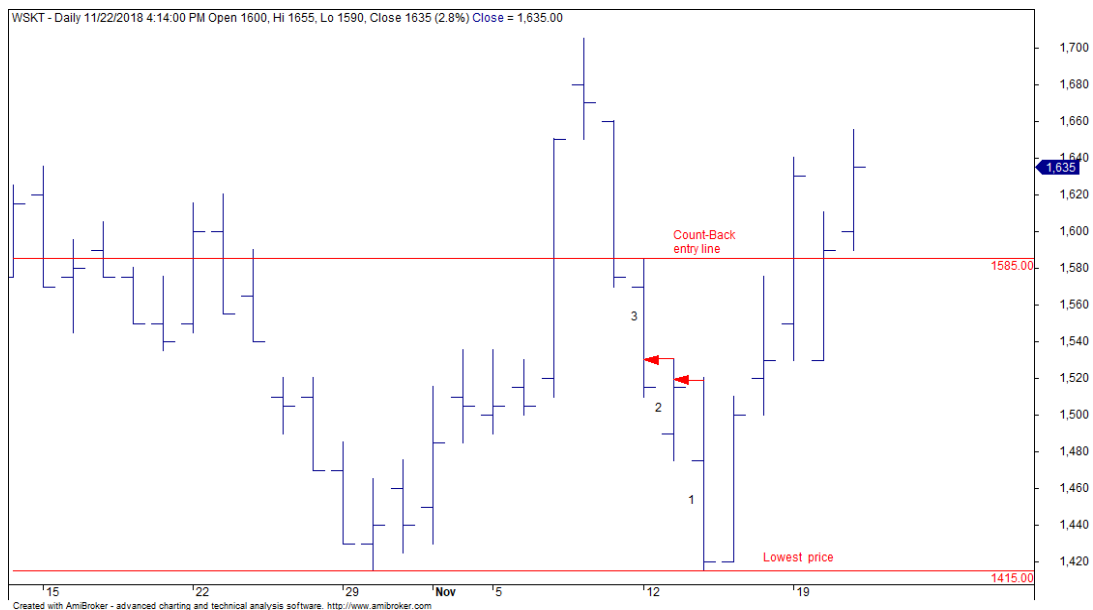
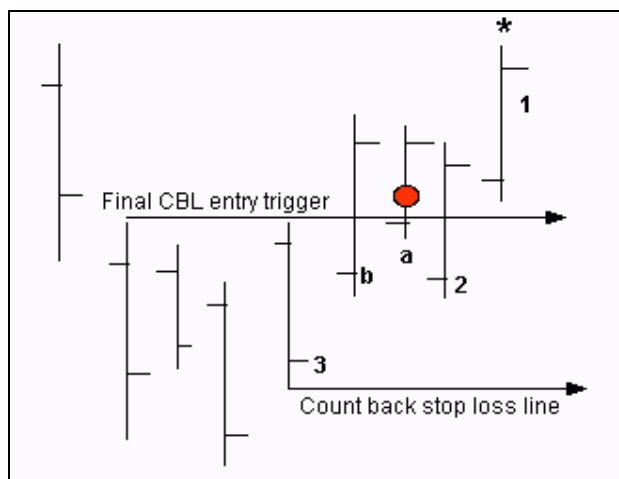Figure 3. Count back line implementation from pivot low

Figure 4. Count back line implementation from pivot high

2. RESEARCH METHODOLOGY

This research is focused on the implementation of technical analysis indicators applied in the investment strategy to buy stocks listed in IDX30 index of IHSG. To attain the objectives of the study exploratory research investment strategy has been used. Technical analysis tools used for the study are candlestick charts. Meanwhile for the technical indicators used in the investment strategy are exponential moving average (EMA) and count back line (CBL).

2.1 DATA

In this research, the author source data for daily stocks' data listed in the IDX30 index in Indonesia Stock Exchange. Information on local daily prices was compiled from the securities platform that used in the investment implementation which is also can be found on the Indonesia Stock Exchange (IDX) websites. This research uses the data from 1st

October 2018 to 31st December 2018. During this 3 months' period there were a total of 62 daily observations from the 30 stocks

2.2 INVESTMENT STRATEGY
The author source data for daily stocks' data listed in the IDX30 index in Indonesia Stock Exchange. Information on local daily prices was compiled from the securities platform that used in the investment implementation which is also can be found on the Indonesia Stock Exchange (IDX) websites. This research uses the data from 1st October 2018 to 31st December 2018.

The first step is to properly set up the candlestick chart with the 5-day EMA and 20-day EMA. Second rule of this investment strategy is the need of the price to trade above 20-day EMA. For the price that move between 5-day EMA and 20-day EMA, the strategy that can be used is to wait until the 5-day EMA crossover 20-day EMA. Buy position will be taken when the 5-day EMA above 20-day EMA. When the chart is in downtrend position, count back line (CBL) will be used to identify the confirmation of trend changes from downtrend to uptrend.

The last step of this investment strategy is to place a stop loss of the open position. The stop loss position is needed to protect the investor's capital and to reduce further losses when the signal is a false signal. Investment strategy use CBL as a stop loss position. The objective using a CBL as an exit is to lock in profits with a trailing stop loss, to allow room for the share to move or retrace, and to exit near the highest price of the uptrend position. Figure 5. shows the example of implementation of the investment strategy.

Figure 5. Buy signal generated using EMA Crossover and CBL

3. RESULTS
Based on the analysis, number of stocks traded using the investment strategy are 27 stocks, consist of ADRO, ANTM, ASII, BBCA, BBNI, BBRI, BBTN, BMRI, BRPT, BSDE, GGRM, HMSP, ICBP, INDF, INTP, JSMR, KLBF, LPPF, PGAS, PTBA, PTPP, SMGR, TLKM, UNTR, UNVR, WSBP, and WSKT. Total number of winning trades is 27 times with average net profit per trade is 8.21%. Table 1. shows the trade result report of 41 transactions' investment strategy performance that has been implemented in stocks

listed in IDX30 index. In this transactions result, the calculation is using a number of shares bought for each stock is 100 shares.

Date	Stock	Buy	Sell	Date	%G/L
10/1/18	INTP	17700	16450	10/4/18	-7.43%
10/1/18	ADRO	1835	1805	10/5/18	-2.03%
10/1/18	BBRI	3160	2890	10/11/18	-8.91%
10/8/18	SMGR	9200	9200	10/29/18	-0.40%
10/9/18	TLKM	3590	3640	10/24/18	0.99%
10/11/18	BRPT	1790	2050	12/18/18	14.07%
10/16/18	KLBF	1335	1550	12/10/18	15.64%
10/16/18	BBNI	7250	7650	11/12/18	5.10%
10/17/18	GGRM	76800	76000	10/24/18	-1.44%
10/17/18	BBRI	3070	2950	10/24/18	-4.29%
10/18/18	PGAS	2230	2190	10/25/18	-2.19%
10/18/18	INDF	6000	7450	12/28/18	23.67%
10/19/18	BSDE	1110	1295	12/5/18	16.20%
10/19/18	ASII	7275	7950	11/12/18	8.84%
10/22/18	UNTR	32300	33650	11/12/18	3.76%
10/30/18	BBCA	23500	23775	11/12/18	0.77%
10/31/18	BMRI	6775	7125	11/21/18	4.75%
10/31/18	BBRI	3100	3250	11/13/18	4.42%
11/1/18	SMGR	9250	9350	11/12/18	0.68%
11/2/18	BBTN	2290	2260	11/12/18	-1.70%
11/2/18	INTP	17350	19450	11/30/18	11.66%
11/8/18	WSKT	1650	1750	12/20/18	5.64%
11/8/18	PTPP	1550	1850	12/26/18	18.88%
11/14/18	ASII	8250	8150	12/6/18	-1.61%
11/15/18	SMGR	10100	11500	12/28/18	13.41%
11/15/18	BBNI	8200	8800	12/28/18	6.89%
11/19/18	BBCA	25050	25050	12/18/18	-0.40%
11/19/18	BBRI	3520	3570	12/10/18	1.02%
11/22/18	BBTN	2460	2570	12/17/18	4.05%
11/22/18	WSBP	336	376	12/28/18	11.46%
11/22/18	ICBP	8900	10450	12/28/18	16.95%
11/29/18	HMSP	3720	3680	12/17/18	-1.47%
12/3/18	UNVR	43800	45400	12/28/18	3.24%
12/3/18	JSMR	4230	4410	12/17/18	3.84%
12/3/18	LPPF	4970	5600	12/28/18	12.23%
12/4/18	BMRI	7650	7300	12/18/18	-4.96%
12/4/18	ANTM	720	765	12/28/18	5.83%
12/6/18	PGAS	2100	2120	12/28/18	0.55%
12/14/18	PTBA	4400	4300	12/28/18	-2.66%
12/19/18	BRPT	2220	2390	12/28/18	7.23%
12/20/18	HMSP	3820	3710	12/28/18	-3.27%

Table 1. Transactions results based on investment strategy

Buy fee that being charged per each transaction is 0.15% from total buy valuation, consist of brokerage fee 0.1%, VAT brokerage fee 0.01%, JSX Levy 0.03%, and KPEI 0.01%. While, for sell fee that being charged per each transaction is 0.25% from total sell valuation, that consist of brokerage fee 0.1%, VAT brokerage fee 0.01%, JSX Levy 0.03%, KPEI 0.01%, and Sales tax 0.1%. Figure 6. shows the investment results summary in the bar chart. The number of transactions with the range of return of -5% until < 0% is

the highest among other range. While the number of transactions that result in a negative return is lower compare to the transactions that give a positive return.
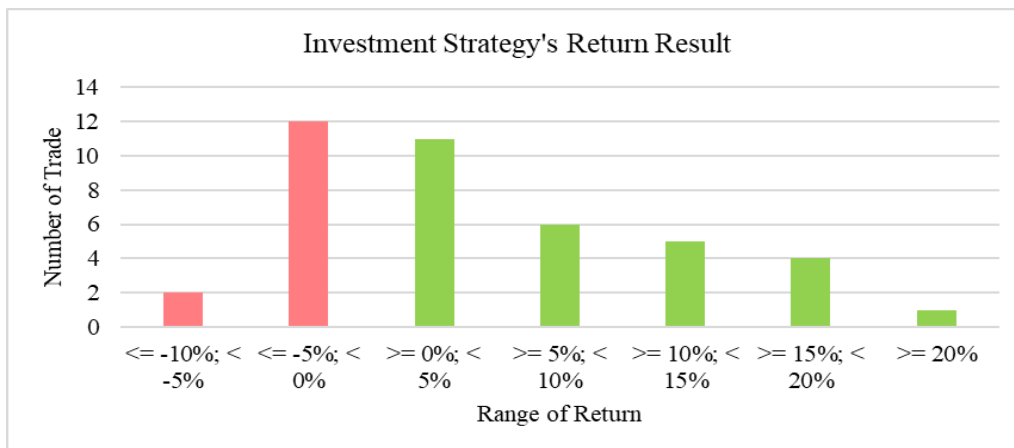

Figure 6. The investment strategy's return result

4. DISCUSSION

The highest net profit during the investment strategy trade period is 23.67% which is a result from INDF on 18th October 2018. Buy position at IDR 6,000 level, confirmed by 3 buy signal which are the close price is higher than 5-EMA and 20-EMA, CBL entry line confirmation, and the EMA crossover. While, the highest net loss that being made during the investment is -8,91%, resulted from BBRI on 1st October 2018.

Figure 7. Highest net profit transaction from INDF

Figure 8. Highest net loss transaction from BBRI

With the return of 4.12% through the calculation from geometric mean calculation, the beta of portfolio is 1.2973. Risk-free rate used for this investment strategy comparison is 0.0273%, which is come from 6.7738% divided by quarterly and divided by 62 days. There are total of 62 days during the 3 months' period. The benchmark was taken from IBPA (Indonesia Bond Pricing Agency) of 1 Tenor Year Government Bond.

Based on the calculation, the Jensen's alpha for the portfolio of investment activity is 0.000968. With the positive value of the Jensen's alpha, this investment portfolio is outperforming the market. The Sharpe ratio of this investment portfolio is 0.14935 and the Treynor ratio is 0.001554. Based on the Sharpe ratio results, the performance of the portfolio is better compared to the additional risk of the portfolio.

4. CONCLUSION

In this researh, the technical analysis used as a decision making tools in Indonesia Stock Exchange based on the investment strategy combining exponential moving average (EMA) and count back line (CBL) as the technical analysis indicator. Based on this research, the number of trade that gain a profit is 27 trades out of 41 trades, which is 65.85% from total trades. While the number of trade that give a negative return are 14 trades which is 34.15% from total 41 number of trades.

After 3 months' period of this research, the risk and return calculated for the portfolio based on the investment strategy. Using a geometric mean calculation, the return during this investment period using exponential moving average (EMA) and count back line (CBL) as technical analysis tool is 4.12%. The return performance of the investment strategy is outperformed the JCI performance. The JCI performance from 1st October 2018 until 31st December 2018 is 4.09%. While the risk calculation use the Sharpe ratio, Jensen's Alpha, and Treynor ratio, resulted in 0.14935; 0.000968; and 0.001554 respectively. The beta of this portfolio is also calculated, resulted in 1.29737 with the average daily return of portfolio is 0.23%. Standard deviation of this portfolio generated from the investment strategy is 0.0135.

From the risk and return calculation, the author concludes that this investment strategy can be used as the stock investment tool in Jakarta Composite Index (JCI). The implementation of this investment strategy conducted only in a short period of time which

is 3-months period. Lastly, the investors also need to know that there's a disclaimer of the implementation of this investment strategy.

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REFERENCES

[1]   Chen, James., & Inc, Ebrary, 2010, *Essentials of Technical Analysis for Financial Markets*, Hokoben, N.J:Wiley.

[2]   Guppy, Daryl, 2009, Count Back Line (CBL), Brainy's Articles on Technical Analysis, July, (2010), Viewed 20 December 2018 at https://www.robertbrain.com/members-area/free-access/articles/ta-technical-analysis/ta-6250_daryl-guppy-CBL_PAGE1.pdf.

[3]   Irwin, Scoot H., Park, Cheol-Ho, (2007), "What Do We Know About the Profitability of Technical Analysis", *Journal of Economic Surveys,* 21: 683-848.

[4]   Lo, Andrew W. & Hasanhodzic, Jasmina., (2010), *The Evolution of Technical Analysis: Financial Prediction from Babylonian Tablets to Bloomberg Terminals*, N.p.: Bloomberg Press.

[5]   Murphy, John J., (1999), *Technical Analysis of the Financial Markets*, Paramus, N.J.: New York Institute of Finance.

[6]   Susi, Indriani, & Marlia, Sri, (2014), "The Evidence of IPO Underpricing in Indonesia 2009-2013", *Review of Integrative Business and Economics Research,* 4(1), 299-316.