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Moving Average Indicator and Trade Set-up as Correlates to Investment Trading in Stock Market: Basis for e Predictability Primer

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ARTICLE INFORMATION	ABSTRACT

Moving average (MA) is one of the many indicators that retail investors can be used when trading their investment in the stock market or any financial market. The inclusion of moving average to trade set-up serves as the guidelines of the retail investors to properly execute the trades. The trade set-up with moving average includes different time frames, numbers of MA and MA with combination to other indicators. The 21 Day MA, 3 different timeframes of MA, 21 MA, and 50 MA for the crossover, and indicators like MACD are the most preferred by the retail investors to add in the trade set-up. The retail investor agrees that the moving average indicator is useful when entering and exiting the trades, when finding the Support and Resistance (SAR) area, predicting new trends, a combination of moving average crossover, MA in combination with other technical indicators. The quantitative method is used to emphasize how MA indicators help the investment trading of retail investors and the statistical result shows the significant relationship between the number of time periods or frames like 9, 21, 50, 100, and 200 Moving Average in entering and exiting the trades. Part of the results shows how Moving Average Convergence and Divergence (MACD) in combining to MA results in an insignificant relationship when exiting and entering the trades. Another result about MACD or Volume Analysis in combining to MA when predicting new trends shows an insignificant relationship. This means that moving average indicators and the trade setup with a proper understanding of each can combine and deliver a better investment result to retail investors.

1. Introduction

Investing in the stock market is one of the many investments to choose from, with its possible return, capital appreciation, dividend, and reward from risk. Investors worldwide continuously execute their trading, from an investor of a multinational company to a retail investor. The progress of the stock market can be seen through the price action and analyzing the price action, the retail investor can use the technical analysis since it is focused on understanding the chart, graphical representation of historical price, inclusion of indicator and oscillator, and more.

Technical analysis helps retail investors strategize on their trading practices. Investing and Trading are quite risky and should have at least backup plans for any possible losses that occur, professionals and beginners used a setup in order to experience gain from the investment. According to Zakamulin (2017), technical analysis in a constantly active and changing price serves as a set of forecasting price movements by covering old price data and discovering its continual regularities or patterns. Some price patterns that develop the same way and can make the same result are fundamental principles of technical analysis. In studying the technical analysis, indicators are always present, and the moving average is a popularly known indicator to retail investors.

Part of the technical analysis is the need to find the support and resistance and to analyze the overall price action of specific stocks, it is necessary to identify the support and resistance (SAR). The support zone includes the floor price of the stocks and the resistance zone includes the ceiling price. Moving average (MA) is an indicator that can be changed depending on the retail investors'

requirements, which means that the indicator can be set according to its preferences. Moving average periods of 9, 15, 30, 50, 100, and 200 are the usual period in any time frames of intraday, daily, weekly, monthly that the retail investors can employ. However, since moving average helps minimize a particular price movement's noise, the more sensitive it is to the changes in price. The longer the time, the less sensitive it is to the changes in price. Zakamulin (2017) observed that moving averages are favorable during a long and robust trend and not favorable during a weak trend. However, because it is a lagging indicator, even the trend was strong but placed in a short-term period, its advantages will disappear. Moving averages are not perfect tools that can always show perfect predictability, especially in high volatility. Steve and Holly Burns (2015) observe that moving averages effectively or work best in low market volatility. The more volatile the market, the less effective it is. Some books and articles show some explanations that moving average can sometimes be added as a guideline to execute the buy and sell orders. Authors and writers employ the moving average indicator in several ways, like predicting the price trends. However, predicting price trends is more difficult since nobody can predict the price, but predicting the price becomes more objective because of the moving average indicator. Moving average indicators combined with other leading and lagging indicators are a good combination in technical analysis.

Trade set-up has its design, there's a set-up built in a longer time frame and others are built-in shorter time frame. A retail investor can create a trade set-up, which applies to their trading or investing personality. The journey to investment trading is not easy and proper set-up is essential. It can be in a shorter view with one indicator or a more extended view with a combination of different indicators. Whatever it is, it should be complemented by the investment trading personality. The moving average indicator can add to a trade setup. However, its characteristics explain as a lagging indicator since it measures the recent price of the different time frame and its addition to a leading indicator or any tools results in better investment trading. Because of the advanced technology, the usage of the indicator becomes more accessible and easy to explore. The moving average and trade set-up primarily identify the proper entry and exit of trades, recognize the support and resistance zone, predict the trends and combine with other indicators applied by the retailer investors when investing in the stock market.

The Stock Market has its language; to invest and trade familiarization successfully to its terms and concepts is necessary. The stock market is the market for all the companies who wish to sell their stocks to the public. Every stock (company) has its historical price action. In charting, the retail investor can apply its creativity by adding different indicators or tools such Relative Strength Index, Stochastics, Elliot wave, Fibonacci, Volume Analysis, MACD, and Moving average (Simple Moving average, Exponential Moving average, Weighted Moving average, and others). The moving average, specifically the Simple Moving average (SMA), computes the average price under different timeframes of chosen stocks listed in the stock market. Companies listed in the stock market have different volatility and different responses from the market noise, which allows the moving average to be one of the most popular and essential indicators in a trade setup. It can be a combination of different indicators or tools created in a long-term and short-term view and merely based on the preference of retail investors. The inclusion of moving average indicator in trade set-up by the retail investors serves as an additional way to objectively predict the new trends, find the support and resistance area and buy and sell the stocks at a profitable price. This study covers the preference and perception of retail investors about moving average indicators when trading the investment of stocks.

1.1 Objective of the Study

The main objective of the study is to determine the moving average indicator and the trade setup applied to investment trading in the stock market with the following question:

1. What is the preferred moving average indicator and trade set-up of a retail investor when trading the investment in the stock market in terms of:
    1.1 Period of Moving Average (Day, Week, Month, Year)
    1.2 Number of Period/Frame (9, 15, 21, 50, 100, 200)
    1.3 Number(s) of Moving Average Combination (1-4)
    1.4 Combination for Moving Average Crossover
    1.5 Combining to Leading or Lagging indicator(s)
2. What is the perception of retail investors on moving average indicator and trade set-up when trading the investment of stock market in terms of:
    2.1 Entry and Exit of Trades
    2.2 Support and Resistance Levels
    2.3 Prediction of New trends
    2.4 Moving Average Crossover
    2.5 The conjunction to another indicator (s)
3. Is there a significant difference in moving average indicator and trade set-up in terms of moving average, number of periods, number of moving average, and moving average crossover when trading the investment in the stock market?

4. Is there a significant correlation between moving average indicator and trade set-up of retail investors when trading the investment in the stock market?

2. Literature Review

Thomsett (2015) explains the Simple Moving average or SMA as the average of current data. It involves removing past data and replacing it with new data. In trading, the mean value of the past x number, an example is a 20-day moving average, provides the mean value of the past 20 trading days**.** He expounds that representing the square measure for the sign of change is the advantage of Simple Moving average (SMA) is bullish and bearish periods. However, its disadvantage is that there is a long lag sign as it uses the historical prices. Duarte (2017)**.** Simple Moving average is easy to compute that takes the average price of the important period and is divided by the period used. *"For example, the mathematical formula for calculating a 5 period SMA as follows: 5 SMA = (Close on day 1 + Close on day 2 + Close on day 3 + Close on day 4 + Close on day 5) / 5".* (Jamsandekar, 2018)

Ponsi (2016) conclude that since there is no standard moving period, the most familiar moving average period used are 10, 20, 50, 150, and 200 SMA's. In investment, when the price moves or breaks below the moving average, some strategy is to sell the stocks. When the price moves or breaks above the moving average, some strategy is to buy the stocks.

Zakamulin (2017) explains that lag time and smoothness are the two vital features of the moving average. A short lag or delay in the trend and high smoothness is the preference of the analyst. In any moving average, its lag and smoothness directly relate to each other—the less the lag or delays, the worse the smoothness**.**

According to Burns and Burns (2017), moving average has no magic that constantly leads to profitability. Every trader has to choose based on their personality, tolerance at risk, and chosen time frame. Every trader must choose how to integrate the moving average to the chosen system and time frame. A 75% accuracy that bears and bull states of the market can be identified by the moving average method. About 75% of the time, the method produces an accurate *Buy and Sell* signal. (Duarte, 2017). In the test conducted by Zakamulin (2017) from his book entitled *Market Timing with Moving average*. The strategy used Moving average (SIMPLE MATCHING COEFFICIENT – SMC) tested over the period generates 76.4% accuracy or ¾ of the time the trading signals produced correctly, however below 100% still generates false signals. In his study, he added that the buy-and-hold strategy using SMC generates 72.5% accuracy, which means that the moving average strategy is a bit more accurate than the *Buy-and-Hold* strategy in defining the stock market status. Part of his study on the accuracy of moving average strategy was about the trend of stock price changes have four months' lag time which concludes that in order for moving average trading strategy to take effect, the period should be four months longer, in addition to his test using the sample of the second part is that moving average trading strategy take effect in every second bear market based on the 12 months' duration test which means that moving average trading strategy does not take effect in a bear market with a span of fewer than 12 months.

Pruitt (2016) observes that moving average removes a good part of noise included in daily price changes. The major enemy of short-term trading is high volatility because it can cause the loss of multiple trades before they catch the winning trade. A longer time frame of moving average such as 50, 100, and 200 days helps filter out the noise daily and intraday charting. Because of volatile price moves, a drawdown is still possible even in a solid long-term trend, and in measuring the proper entry and exit, moving average is the most critical tool to add to a trading system since moving averages are objective indicators of trends and based on quantifiable data, it is one of the fastest and easiest tools to measure the new trend in a specific period (Burns and Burns, 2015).

The study conducted by Alajbeg and Bubas (2017) showed that the range of stock price towards their moving average and its potential return has a connection. When searching for the best buying positions, a potential return can be achieved using the moving average distance from the price.   A suggestion of buying of below 0-5% in moving average 20 and 50 and less effective when buying below 0-10% in moving average 100 and 200, while it is not advisable to buy way far below the moving average in almost any period. In totality, it is advisable to only buy below the moving average but not too far below the moving average. According to Zakamulin (2017) that it is advantageous for the moving average method in the solid and long-term trend. However, when the trend is weak, the advantage will disappear because of its lagging character. Its advantage also disappears even if the trend is solid but short-term. Schwager and Etzkorn (2017) explain that moving averages could give straightforward and practical techniques in identifying trends, especially if the market is trending, and can result in a false signal in a choppy or sideways market. Moving average is a valuable indicator in trending days but can kill the trade during choppy days**.** Since moving average continually shows as lagging indicators, it effectively confirms indicators but not as primary indicators (Thomsett, 2017). A picture of clear overall price direction can be given to the investors when using the simple moving average indicator. The moving average that consists shorter period tends to be sensitive to price changes. In comparison, the moving average that consists of a more extended period can slowly adapt to price changes (Ponsi, 2016). Moving average is the most well-known indicator in analyzing the chart and a tool to identify the support and resistance to generate a buying trade. The moving average line is a line that smoothly

changes the trend from rising to falling or vice versa. This line and the price move together that indicate a quick explanation about the price movement where the MA in a longer-term has a lower response from the MA in a shorter view (Jamsandekar, 2018). There's no assurance that when the moving average approaches or crosses above or below the price might be the signal to change the price direction. However, when moving average uncovers the confirmation of other signals such as the price and volume reversal signal, it gives an additional signal as confirmation of what price prediction uncovers (Thomsett, 2017). The study *Momentum Investing with Moving averages in the U.S. Stock Market* by Suominen (2016) concluded that the moving average could be used differently, like generating the buy and sell signals crossover moving average and stocks closing price. For the crossover indicator, to decrease the short-term risk, use the shorter pair of moving averages. The commonly used pair is 15 and 30-day SMAs or 20 and 50-day SMAs. (Duarte, 2017)

Ponsi (2016) explains the moving average location with one another can be used as a signal to execute trading or investing, like when then 10-period SMA is above to 20-period SMA, 20-period is above to 50-period, 50-period is above to 200-period with the following order of moving average 10 > 20 > 50 > 200. On the different trend like downtrend, the arrangement of moving is 200 > 50 > 20 > 10. Thomsett (2015) added that a great lag of moving average is computed over a long period and explains that price movement of a 50-day moving average is more sensitive compare to 200-day MA. The use of two moving averages with different types and periods is necessary, especially in developing timing and confirmation for any trend reversal. However, the moving average can be a simple moving average that provides equal weight to each previous price from the specified period. The main moving average periods are 21, 55, 100, 200, and 9, 14 for the short term trading, combinations of two or more moving averages, and using the crossover as the signal to buy and sell like when using the nine and 21-day period when nine-day period as the faster MA crosses above the 21-day as the slower MA a signal to buy is the suggestion and when the 21-day period is above the nine days a signal to sell is the suggestion (Brooks and Dolan, 2015). It is considered that longer moving averages were slower and less responsive to price changes because the line is smoother, easily identified in the chart (Duarte, 2017).

Burns and Burns (2017) suggest entering the market when the long-term moving average cross under the short-term moving average and exit the trades when the short-term moving average cross under the long-term moving average. Cam (2015) observes that the shorter the MA, the more sensitive the price, and the longer the MA, the less sensitive it is to price changes. He used 21-SMA, 50-SMA, 200-SMA, and 15 EMA (Exponential Moving average). Cam suggested a maximum of 4 MA's with at least one short-term, medium-term, and long-term MA's. He added that a 200-period SMA is for the long-term period and consider as the popular moving average. Institutions generally use this period to look at the trends in a yearly view. The 50-period SMA is for the medium-term period and considers as an identifier of the trend that is usually used to find any tradable trend. The 21-period SMA is for the short-term period that reflects the 21 trading days of the month. He also added the 15 periods EMA to use as the most responsive to the fluctuation of price and usually used when trading in a short-term period. However, the combination that can be arranged in a chart with any period of one market working week (5), fortnight (13), month (26) qualify in creating a better entry and exit trade decision which are resulted logically in a lower risk (Jamsandekar, 2018). In the study of Glabadanidis (2017), he explains that the combination of moving average strategy does not include too much trading when administered on a daily response that has favorable break-even transaction costs and can be doable by an investor in a large institution. Kresta and Franek (2015) found out from their study that even after deducting the transaction cost, the moving average crossover strategy is still profitable. On the contrary, in the study conducted by Pierrefeu (2019), it is not profitable to use the Moving Average Crossover and use the closing market price and consider the high, low, open market information price. A minor moving average should crossover in the other moving average period. A positive crossover is when the moving average cross over in an uptrend. A negative crossover occurs when the moving average crossover moves in a downtrend (Jamsandekar, 2018). A single indicator or a pair of moving averages is impossible for successful trade because of the market's complexity to extract money with a single tool. A need to consider the advantages and disadvantages of moving average since it is a lagging indicator and a trend following that will always step behind and should be used to combine other complementary tools or other indicators and not used as a sole indicator. (Hongguang et al., 2016) Moving average is also best as the confirmation while using the relative strength line as the leading indicator (Duarte, 2017). However, no set of combinations consistently assure profits. In the study conducted by Metghalchi et al. (2016) that other indicators such as RSI and MACD as one of the most popular indicators also indicate a value to predict applied to the NASDAQ composite index from sub-period to entire period and also show a more responsive in going in and out of the market compare to the MA100.

According to Charles (2018), trading is a transaction relating to assets buying and selling. The transaction can be purchased from financial security like the stock market, currency, and commodities. Stocks have many kinds; however, investors refer to the stock market as common stocks. Overall, the stock market does not change its price quickly and should not expect a significant return on investment for a short period compared to investment in the long term. However, the question for long-term investment is its difficulty predicting the market's response to the investments. The stock market does not react quickly as one of the challenges for day trading since it took 24 hours to react to the prediction. (Yamazaki, 2019)

The Philippine Stock Exchange was one of the oldest exchanges in Asia. It is a self-regulatory organization that allows buying, selling or trading, clearing, and settlement services for the stock's securities. The Philippine Stock Exchange has 1,228,038 stock market accounts gathered from the active trading participants for the end of the year 2019, with 1,208,480 or 98.4% from a local account 19,558 or 1.6% coming from foreign accounts. The report also includes 1,199,565 retail investors and 28,473 from institutional investors. The online accounts of 782,118 majorities come from retail investors. The organization also published a report about the number of the account holder of retail investors classified by age has 21.7% for the aged 18-29; 45.5% for the aged 30-44; 20.3% for the aged of 45-59, and 12.5% for the aged of 60 and above. The account holder of online investors classified by age has 26.2% for the aged 18-29; 53.1% for the aged of 30-44; 16.2% for the aged 45-59 and 4.5% for 60 and above. The report also includes the number of online investors that women with 51.6% are higher than men with 48.4%. (pse.gov.ph)

Stock prices depend on the economy, business performance, consumer behavior, developments of technology, and others as the reasons behind price fluctuations since up and down are usual to the stock market (Yamazaki, 2019). A study made by Darby et al. (2019) that the institutional investors execute the buy and sell behavior on excessive up and down days in Shanghai and Shenzhen Stock Exchanges, that the impact of the institutional trading on the performance of the firm during extreme days have a strong proof that the investors from the institution worsen the stock market volatility. The study conducted by Raudys and Pabarskaite (2016) includes observations that are moving average fixed weights and intend to smooth or produce the most accurate results or data. Their study appears that the model they created is more accurate compare to other stock price series of smoothing using well known moving average indicator; their study focuses on the accuracy of customs moving average that entails having an accuracy of 99.5% using cases of synthetic data and 91% using cases of stock data in the real world. Khorram and Sheshmani (2015) concluded that technical analysis is the prediction technique used by most investors. The chartist tries to predict the trend of stocks accurately by validating the historical trend. Their study used the correlation-based filter with a moving average of 5, 25, 48, 50, 89 days. It resulted in a more compatible, especially in predicting the stock prices of the Tehran Stock Exchange. Their study also included the filtering of moving averages and use the chosen moving average, which became more applicable in predicting the prices of stocks in the short-term period to the Tehran Stock Exchange sample firms. Also, Silva de Souza et al. (2018) created the study from the BRICS Stocks Exchange (Brazil, Russia, India, China, South Africa) that the BRICS markets may share some common characteristics. There is a particular asset with good performance with a moving average as part of their trading system. However, some assets are not performing well, even with a combination of moving averages. Their conclusion is the difficulty of the combination of moving average to use in different assets. According to Duarte (2017), it is better to analyze some stocks with one moving average than another and try another moving average to another circumstance is a good concept. Also, moving averages are less effective during a volatile market, not consistent in ranging markets, and prone to whipsaw or drastic movement of price in the opposite direction (Lim, 2016). In the study conducted by Alfonso and Ramirez (2020), there are many technical indicators as the potential variables have an existing possibility to affect the stock market performance and cannot be supported by any indisputable evidence.

Trading indicates a playful way, like buying and selling not more than one stock on a day. At the same time, investing indicates not the too active in buying and selling of few stocks and holding them for a long time, and selling them after earning a profit (Yamazaki, 2019). Traders are called the market participants who execute trading. Traders can be institutional traders. A retail trader was an institutional trader who executes trading according to their job description rendered by any commercial bank, investment bank, hedge fund, or any financial institution. In contrast, retail traders are the traders who trade according to their plan or trade setup. (Charles, 2018) However, Jason Cam (2015) explains that an investor is also a trader that focuses on a longer time frame, such as months or years. Traders can be *day trader* that focuses on trading within the day and does not make a trade that will stay overnight. Another trader is the *swing trader* that focuses on holding the trade for several days, especially during momentum moves. The last type of trader is the position trader that focuses on holding their trade for several weeks, months, or years and typically used the fundamentals when analyzing the market. The length of time of investment depends on different preferences. Many invest on a day, and others invest for more than years (Yamazaki, 2019). They usually predict future price direction by gathering the recent trend price (Zakamulin, 2017). A day trader is the participants that buy and sells stocks and actively participate in buying and selling as fast as when there is a price reaction and should use the Moving average in a shorter average such as 3, 5, 7, 10, 11, or 13-period arrange in a chart with a 5-minute time frame. The swing trader, short-term investors, position trader should use the 5 (*one market working week*), 13 (*fortnight*), 26 (*month*) period of moving average arrange in a chart with a day time frame. The long-term investor should use a moving average combination used by the short-term investor and 50, 100, 200- period arrange in a chart with a weekly and monthly timeframe (Jamsandekar, 2018). Brooks and Dolan (2015) explain that a trade set-up is an opportunity to trade found through individual technical and fundamental analysis. The study conducted by Hussain et al. (2019) that the combination of moving average to candlesticks supply or an indication as a good signal can be added in investment decision-making.

3. Methodology

The study employs a quantitative analysis approach to obtain data from the moving average indicator and trade setup applied to investing in the stock market as a basis for the e-predictability primer. The study also includes a researcher-made survey questionnaire created from the compilation of authors' views, studies, results, output, interpretation of related studies, literature, journals, article, magazine, websites, and others. The survey composes of different questions to be answered by the retail investors including the profile, preference, and perception when using the moving average indicators and trade set up. The participants of the study were retail investors from active trading participants of the Philippine Stock Market with experience buying and selling shares of stocks and a user of moving average indicator and trade setup applied to investment. The sample was selected using convenience sampling, a non-probability sampling method. The survey questionnaire distributed provides information about their investing profile, preferences, and perception when using the moving average indicator. The distribution was made to selected retail investors from active trading participants of the stock market in the Philippines. The number of sample respondents is based on Corporate Planning. Research Department of Philippine Stock Exchange reports last July 2020 entitled: "The Stock Market Investor Profile 2019", the report summarizes the total number of the stock market account from the active trading participants as of 2019 with 1,228,083 emphasizing the combination of 97.7% or 1,199,565 for the retail investor and 2.3% or 28,473 for the institutional investor.

3.1 Data Gathering Instrument and Procedure
The research study administered a questionnaire using a researcher-made questionnaire. The questionnaire was designed with fixed-alternative questions to answer the retail investors' profiles such as gender, age, educational attainment, and years in trading/investing. Part of the fixed-alternative question will answer the preference when using the moving average indicator and trade set up. It also includes scale questions to measure respondents' perceptions about moving average indicators when trading/investing in the stock market. The validity of instruments was done with several measurements and validation, through the assistance and contribution of industry practitioners, professionals, and research experts with their suggestions and approval of the questions included in the survey questionnaires. In addition, to validate the survey questionnaire the Cronbach's alpha was employed to test the internal consistency or how closely related a set of items are as a group. The procedure used in the study to identify the response of the respondent about the questions of demographic profile and different variables, the number of sample respondents use Slovin formula with marginal error .05.

3.2 Data Analysis Tools Subheading (if any)
The research study statistical tools and techniques are the combination of Frequency-Percentage to determine the demographic profile of the respondents such as age, gender, educational attainment, and years in trading, the computation of Mean to the responses about the preferences when using the moving average indicator, the inclusion of Shapiro-Wilk which is necessary to test the normality for the assumption of data. Lastly, Kruskal-Walis is a nonparametric test to compare the means of multiple groups and the Spearman rho correlation to measure the strength and direction of the association between two ranked variables.

4. Results and Discussion
This researcher emphasizes the interpretation of data gathered from the survey questions, including the respondents' demographic information and the data to answer the problem statement about the preference and perception of the respondents about moving average indicator and the trade setup

Table 1: Preferred Moving Average Indicator and trade set-up of Retail Investor

	n	%
Period of Moving Average Indicator		
Minute	79	18.12

Hour	107	24.54
Day	120	27.52
Week	78	17.89
Month	48	11.01
Others	4	0.92
Number of Time Frame/ Period		
9	58	13.3
21	133	30.5
50	107	24.54
100	80	18.35
200	52	11.93
Others	6	1.38
Number of Combination of Moving Average Indicator		
1	37	8.49
2	107	24.54
3	113	25.92
4	111	25.46
5	62	14.22
Others	6	1.38
Combination of Moving Average Crossover		
9 and 21	94	21.56
9 and 50	96	22.02
5 and 21	43	9.86
21 and 50	123	28.21
21 and 100	66	15.14
Others	14	3.21
Combination to Leading and Lagging Indicator		
RSI	70	16.06
MACD	137	31.42
Stochastics	123	28.21
EMA/WMA	99	22.71
Others	7	1.61
Total	**436**	**100**

Table 1 shows that in terms of the period of moving average, 27.52% selected day since the length of the moving average can change depending on the preferences, it also shows that more than half of the retail investors prefer to apply the day as the period of moving average indicator and trade set up the same suggestions from experts and author, closely followed by an hour with 24.54% and shows that aside from the day, an hour is the most preferred by the retail investors, next is minute with 18.12% which the researcher thinks is one of the most volatile when measuring the price action, followed by a week with 17.89% which was also preferred by the position trader which according to Cam (2015) that this trader views their trades on the number of weeks, while 11.01% selected month which also the preferred period of the position trader while there are .92% selected other period of moving average indicator which also shows that there are retail investors that prefer to adopt another period than the usual period used by the retail investors. The result also shows that in terms of the number of time frame/ period of moving average (MA) 30% prefer 21 MA, with the same suggestion from Brooks and Dolan (2015) that 21 and other MA can be used as the central moving average to apply in short term trading, Cam (2015) employ the 21-SMA and 50-SMA, which is the second highest number as the prefer to use by the investors with 24.54% and Thomsett (2015) observed that 50-day moving average are more sensitive than the higher period like 100 MA with 18.35% while 200 MA that has 11.93% percentage from the respondents who prefer to use as the period for moving average, in addition Burns and Burns (2015) observed that the higher period like 50,100 and 200 helps to filter the noise in a daily or intraday charting and according to Cam (2015) that 200 MA are well known moving average especially in long term period, while there are 13.3% prefer to apply the 9 MA and according to Brooks and Dolan (2015) that this MA can apply as the central MA for the short term trading, Lastly, there are 1.38% prefer other time period of moving average. In terms of the number of moving average combinations, the result shows that 25.92% prefer 3 MA, 4 MA have 25.46% with almost the same percentage of 3 MA. In comparison, there are 24.54% of the respondents prefer 2 MA. This result is the same observation with Brooks and Dolan (2015) that the combination of two or more MA can be the guide as buy and sell signal, while Thomsett (2015) observed that the combination of two moving average is necessary to confirm the new trend and possible reversal of trend, A 14.22% of the respondents prefer 5 MA which can relate to the study made by Mitchell (2019) from Investopedia that explains the

moving ribbon, this is the moving average were traders prefer a small number or more MA. The least number that is preferred by the investors is 1 MA with 8.49%. However, Duarte (2017) observes that one moving average is better used in analyzing the stocks. Lastly, 1.38% of the respondents prefer to use other moving average combinations. The result also shows that in terms of combination of moving average crossover 28.21% prefer the MA combination of 21 and 50 this combination also suggest by Cam (2015) from his book, he explains that 50 moving average define as the identifier of trend while 21 moving average reflects the 21 trading days of the month, In addition, both moving average also the most prefer moving average of the retail investors which also connected why it has the highest percentage when using as the moving average crossover, The next moving average crossover is the combination of 9 and 50 with 22.02% which also the suggestion of Duarte (2017) to apply a shorter pair to lessen the risk in short term, 9 and 21 moving average crossover as the following highest percentage of respondents with 21.56% and this combination suggested by Brooks and Dolan (2015) were they explain that 9 day moving average serve as the faster MA while 21 serve as the slower MA, 21 and 100 moving average crossover with 15.14%, The next moving average crossover 5 and 21 has 9.86% of respondents which can relate to the combination suggested by Burns and Burns (2017) a combination of 5 Day and 20 Day moving average, Lastly there are 3.21% of the respondents still prefer other moving average crossover. In terms of the leading and lagging combination to moving average, the results show that 31.42% prefer MACD, which can relate to the study of Lien (2020) from Investopedia. She concludes that the combination of MACD and moving average can help in following the trend profitably. Stochastics is the next indicator with 28.21% that can combine with moving average, followed by Exponential MA and Weighted MA with 22.71%, RSI with 16.06% and according to Duarte (2017), the moving average can use as the confirmation while relative strength index will serve as the leading indicator. And others with 1.61%.

Table 2: Perception of Retail Investors on Moving Average Indicator and Trade Set up

Criteria: *Perception when entering and exiting the trades*	Mean	Std. Dev.	Verbal Description
A moving average provides proper measurement when entering and exiting the trades.	3.47	0.71	Strongly Agree
Changes of moving average give a faster signal to enter and exit the trades	3.01	0.75	Agree
Moving average used as a guide to enter and exit the trades	3.06	0.82	Agree
Moving average is the best tool to enter and exit the trades	3.03	0.87	Agree
Moving average gives an accurate signal to enter and exit the trades	2.99	1.03	Agree
Mean Response	***3.11***	***0.84***	***Agree***
Criteria: *Perception of retail investors when using moving average as support and resistance level*	Mean	Std. Dev.	Verbal Description
Moving average is best to use as the critical support and resistance level	3.2	0.89	Agree
A moving average provides a clear indication of support and resistance level	3.14	0.89	Agree
A moving average can be used as support and resistance when executing trades	3.14	0.86	Agree
Multiple Moving average provides a clear indication of support and resistance level	3.04	0.83	Agree
Moving average is best to use as a tool in finding the support and resistance level	2.97	0.92	Agree
Mean Response	***3.1***	***0.88***	***Agree***
Criteria: *Perception of retail investors when using the moving average in predicting trends*	Mean	Std. Dev.	Verbal Description
Moving average is best to use when predicting new trends during the bullish period	3.03	0.85	Agree
Moving average is best to use when predicting new trends during the bearish period	3.04	0.87	Agree
Moving average is best to use when predicting new trends during the ranging period	3.05	0.86	Agree
A moving average can be effectively used when predicting new trends for short-term trading	3.04	0.88	Agree
Moving average timely identify the direction of price trends	3.08	0.85	Agree
Moving average recognize the early turning point of trends	2.99	0.93	Agree
Moving average serves as an objective trend indicator	3.07	0.89	Agree
A sign of a new trend when price action moves above/below the moving average	3	0.9	Agree

Mean Response	3.04	0.88	Agree
Criteria: *Perception of retail investors when applying moving average crossover*	**Mean**	**Std. Dev.**	**Verbal Description**
Moving average crossover is effective in predicting new trends	3.1	0.87	Agree
Moving average crossover generates a buy and sells signal	3.11	0.83	Agree
Moving average crossover is better for trend confirmation	3.01	0.83	Agree
Moving average crossover signals a confirming, declining, and growing momentum	2.98	0.84	Agree
Moving average crossover helps to timely confirm the reversals of trend	3.04	0.89	Agree
Moving average crossover with the combinations of other indicators helps to identify the new trends	3.11	0.85	Agree
Moving average crossover signifies the beginning and end of a trend	3.1	0.85	Agree
Moving average crossover provides guidelines in entering and exiting the trades	3.15	0.85	Agree
Mean Response	3.07	0.85	Agree
Criteria: *Perception of retail investors when combining moving average to other indicators and tools*	**Mean**	**Std. Dev.**	**Verbal Description**
Relative Strength Index	3.17	0.81	Agree
Stochastics	3.05	0.82	Agree
Other MA (EMA, WMA, and others)	3.07	0.79	Agree
MACD	3.08	0.83	Agree
Volume Analysis	3.09	0.85	Agree
Elliot Wave	3.05	0.88	Agree
Fibonacci	3.05	0.86	Agree
Other indicators	3.09	0.84	Agree
Mean Response	3.08	0.83	Agree

Table 2 shows the level of perception of a retail investor on moving average indicator in adding to trade set-up in relation to the observation of Burns and Burns (2015) that moving average is an essential tool that can measure the entering and exiting of trades. Thus, the retail investors agree to strongly agree that moving average can use to enter and exit the trades**.** It also shows that in terms of using moving average as support and resistance level it can relate to Jamsandekar's (2018) explanation, moving average is the most well-known indicator in identifying the support and resistance, which shows in the survey results that the majority of the retail investors agree that the indicator can apply to correctly identify the support and resistance of the stock price. In addition, the table also shows that in terms of using moving average when predicting new trends, it was found out that the response that moving average can use in predicting trends. The same observation of Burns and Burns (2015) that moving average is considered one of the fastest and easiest tools to measure the new trend. The table also shows that in terms of applying moving average crossover, it was found out that the retail investors agree that moving average crossover helps predict trends, in finding correct entry and exit trades, a signal to confirm, decline and growing momentum which can relate to study of Duarte (2017) were in moving average crossover has a place in trading and can use as a trading system the same suggestion by Burns and Burns (2017) and consider the MA consider as the sole trading system that gives a maximum return. Lastly, it shows that in terms of combining moving average to technical indicator and tools, it was found out that the respondents that the response of retail investors about the combination of moving average to other tools and indicators shows similarity that moving average can give a better result when combining to other tools and indicators specifically with RSI with the highest number of average. These results are also connected to the preference of retail investors.

Table 3: KruskalWallis Test: Comparing the Means of Multiple Group

	Minute	Hour	Day	Week	Month	chi-sqrd	p-value	Inter-Pretation	Decision
Observation	79	107	120	78	48				
Criteria	Rank Sum								
Entry and Exit of Trades	16505	24388.5	23754	17443	11437.5	5.65	0.23	Not Significant	Retained Ho
Support and Resistance Levels	16753	23865	24264	16831	11815	4.68	0.32	Not Significant	Retained Ho
Prediction of New trends	16550.5	23052	24946.5	17857	11122	2.31	0.68	Not Significant	Retained Ho
Moving Average Crossover	18755.5	23892	23111.5	16988	10781	7.23	0.12	Not Significant	Retained Ho
Combining to Other indicators	16958.5	23813.5	23294.5	18238	10360.5	4.6	0.33	Not Significant	Retained Ho

	9	21	50	100	200	chi-sqrd	p-value	Inter-Pretation	Decision
Observation	58	133	107	80	52				
	Rank Sum								
Entry and Exit of Trades	11916.5	27091	22376.5	18272	13009	6.9	0.14	Not Significant	Retained Ho
Support and Resistance Levels	11915.5	28328	23635	16049	12737.5	4.77	0.31	Not Significant	Retained Ho
Prediction of New trends	12158	27759.5	21394.5	18092.5	13260.5	8.13	0.09	Not Significant	Retained Ho
Moving Average Crossover	11682.5	29407.5	22886	16388	12301	3.15	0.53	Not Significant	Retained Ho
Combining to Other indicators	12364	28108	23151	16962	11221	0.297	0.99	Not Significant	Retained Ho

	1	2	3	4	5	chi-sqrd	p-value	Inter-pretation	Decision
Observation	37	107	113	111	62				
Criteria	Rank Sum								
Entry and Exit of Trades	8493	22939	23070.5	22617.5	15545	7.53	0.11	Not Significant	Retained Ho
Support and Resistance Levels	9129.5	21991.5	22931.5	24048	14564.5	5.78	0.22	Not Significant	Retained Ho
Prediction of New trends	9688.5	22782.5	23101.5	22441	14651.5	9.19	0.06	Not Significant	Retained Ho
Moving Average Crossover	8221	23830.5	23452	22849	14312.5	2.58	0.63	Not Significant	Retained Ho
Combining to Other indicators	8078	21927	23315	23083.5	15402.5	5.83	0.21	Not Significant	Retained Ho

	9 and 21	9 and 50	5 and 21	21 and 50	1 and 100	chi-sqrd	p-value	Inter-pretation	Decision
Observation	94	96	43	123	66				
	Rank Sum								
Entry and Exit of Trades	19624	19628	10394	24719.5	14887.5	4.89	0.3	Not Significant	Retained Ho
Support and Resistance Levels	19452	22575.5	8605.5	25165	13455	4.84	0.3	Not Significant	Retained Ho
Prediction of New trends	18276.5	21745	9344.5	25891	13996	3.44	0.49	Not Significant	Retained Ho
Moving Average Crossover	19399	21757	9499	24635	13963	2.98	0.56	Not Significant	Retained Ho
Combining to Other indicators	18224.5	22540	10414.5	24506.5	13145.5	9.81	0.04	Significant	Retained Ho

Table 3 result shows a statistically significant difference to all of the criteria from the entry and exit of trades, support and resistance levels, prediction of new trends, and moving average crossover, combining them with other indicators. The result can relate to Burns and Burns' observation (2017) that a particular trader can use any time frame relatable to the trading personality and risk tolerance. Another statistical result shows a significant difference to all of the criteria from the entry and exit of trades, support and resistance levels, prediction of new trends, moving average crossover, combining to other indicators which can relate to Ponsi (2016) observations that there is no standard period in using the moving average indicator, however, he suggests a most familiar period to apply. In continuation, the result shows a statistically significant difference to all of the criteria from the entry and exit of trades, support and resistance levels, prediction of new trends, and moving average crossover, combining them with other indicators. The result can relate to Ponsi's (2016) observation that there is no perfect combination of moving average. It is better to create a series of tests to find the right combination for the trading or investing personality. The next result shows a not statistically significant difference to the criteria of entry and exit of trades, support and resistance levels, prediction of new trends, and moving average crossover. However, a statistically significant difference shows when moving average crossover combining to other indicators, which explains that a different outcome can be seen when using the crossover to different indicators since indicators have different functions. In continuation, the result shows a not statistically significant difference to the criteria of entry

and exit of trades, support and resistance levels, moving average crossover, and combining to other indicators; however, a statistically significant difference shows when combining the leading and lagging indicators in predicting new trends which explains that a different outcome can be seen when combining lagging to leading indicators since different indicators have different functions. The result also shows a not statistically significant correlation to most of the criteria except to several periods/frame to use when entering and exiting the trades, which can relate to Ponsi (2016) observation that to execute the trading or investing a series of a period of moving average can be used like 10>20>50>200. Lastly, the result shows a statistically significant correlation to the criteria of MACD when entering and exiting the trades. Since MACD is a helpful tool in investment trading, it is still necessary to closely examine its application, especially in entering and exiting the trades. Another significant correlation to MACD and Volume Analysis criteria when predicting new trends since Volume analysis can be used in interpreting the supply and demand of order which is better to look closely, especially in predicting new trends. The result only shows that different indicators have different results based on the perception of retail investors on moving average indicators and trade setup when trading the investment in the stock market.

5. Conclusion

The majority of trading participants' gender came from the male category which also explains that male is more interested in trading. However, some research shows that females started to beat the number of males, especially in an online set-up. Though the gender of the retail investors does not significantly affect the final trade set-up, it still creates an idea that the majority of the result from the perception about moving average came from the male category. In terms of age, the majority are from the millennial and gen z generation, which also explains that the latest generation is becoming more familiar and willing to trade and invest in the stock market. In terms of the years in trading and investing, most are still learning and observing the market. In terms of educational attainment, almost half of the respondents are professionals and with college and post-graduate diplomas, which also explains that they become aware or might have financial literacy that can be used in trading and investing in the stock market.

The preference of retail investors in terms of the period of moving average indicates that using day and hour periods make the moving average more useful in the trading set-up, which explains that using the closing price from the daily and hourly provides a better result than the other period, though weekly, monthly also provide good result trading plan matter if the retail investors prefer the more extended period or a shorter period. The number of Period/ Frame preferred by the retail investors shows that the 21 and 50 periods of - can be used as a combination to the preferred period, which is day and hour, that is why many author and writer of books and research suggests to include the 21-day or 50-day moving average to trades set-up. The number combination of moving average indicators preferred by the retail investor is either 3, 4, 2 combinations. It shows that moving average is best to use combined and not as effective as one moving average. The preferred combination of moving average is 21 and 50. This only shows that the number of period/frames is connected to their combination as part of their trades set-up. The moving average indicator can combine with other leading and lagging indicators. It shows that retail investors prefer to use MACD and stochastics as the other indicator to combine with the moving average. This is an example that moving average should not be the sole indicator in trade set-up. Other indicators also create a better result. The result on the perception of retail investors about moving average indicators and trade setup indicates that though most of them show a similar perception, few retail investors strongly agree, agree, strongly disagree, and disagree about other characteristics of moving average and the trade setup applied to investment trading in the stock market. Therefore, in using the moving average indicator and any trade set up while trading the investment in the stock market, in-depth knowledge is necessary to better understand the outcome created.

The significant difference in the moving average indicator and trade set-up in terms of moving average, number of periods, number of moving average, combination for moving average crossover. The null hypothesis was accepted since there is no significant difference in the moving average indicator when used in trades set up in terms of the period of moving average, number of period/frame, number of moving average. However, a significant difference resulted under the moving average crossover when combined with other indicators. This sign shows that a moving average crossover can be effectively used with the right combinations of indicators. Another significant difference results from combining the moving average to leading and lagging indicators which only shows that when moving average combines with other indicators, there is a significant difference in predicting new trends. The significant difference only shows that though most of the respondents used the moving average to their trade set-up, a different result might encounter every time another indicator was added. Therefore, it is better to try different indicators to find the exact or compatible combination that meets the retail investors' trading behavior or risk tolerance.

The significant correlation between the moving average indicator and trade set-up of the retail investor was the null hypothesis failed to reject since there is no significant correlation between the moving average indicator and the retail investor's trading set-up. The retail investors' trade set-up includes moving average, the number of period/frame, the number of moving average. However, a significant correlation is shown under MACD and Volume analysis, specifically when entering and exiting the trades and predicting new trends. The significant correlation shows that the right combination of lagging and leading indicators, other tools are essential to create a better result in a trade set-up. It is essential to consider the function of each indicator before combining it with the moving average indicator.

Whatever the profile, the retail investors choose to try investing in the stock market and this is a good sign of the willingness to learn the investment trading, however, there are many investments available in the market that's why it is important to start with the research to improve the financial literacy. Another important factor is to observe the behavior towards investments. Since there are different behaviors towards investment like being risky or too conservative investments personality, a test is necessary to take in order to understand the behavior towards different investments. The result on each trade setup should be monitored, updated, and revised until a winning trade is the result of the trade setup. Adding moving average in trade set-up should fit their personality, risk appetite, schedule, and capital.

Conflicts of Interest: The author declares no conflict of interest

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