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Profitability of The Moving Averages Technical Trading Rules in an Emerging Stock Market-A Study of Individual Stocks Listed On Pakistan Stock Exchange

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ABSTRACT
This paper investigates the gainfulness of moving averages (MA) timing method over the purchase and hold procedure for single stocks deal in Pakistan Stock Exchange. We used (Han et al., 2013) approach of single stock returns and indeterminate evidence of MA timing methodology insightful ability to increase higher returns over the strategy of purchase and hold. In addition, we report market risk-adjusted returns to expel any market development impacts and apply elective moving averages lag lengths to check the robustness of our outcomes. We look at that individual stock returns are noisier than portfolio returns and the fundamental technical exchanging principle of moving average don't be able to anticipate single stock returns. We propose the utilization of more perplexing trading rules in future investigations to determine the gainfulness of technical trading rules in individual stocks.

Keywords: *Individual stocks, moving averages, technical analysis*

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INTRODUCTION

Technical analysis guarantees the capacity to gauge the future directions of asset prices through the investigation of past market information (Zhu and Zhou, 2009). The fundamental rule of technical analysis is that pattern associated with the instrument past prices exchanged in the market of the asset which can be utilized to foresee the future prices (de Souza et al., 2018). The goal is to upgrade the return of a venture portfolio by understanding the connection of price indicators for the portfolio's possessions over the particular time period. As indicated by Stanković et al. (2015) technical analysis is a method for recognizing patterns in asset prices in light of the preface that the price arrangement moves as per speculators' apparent norms. Their investigation showed that the span of these standards is adequate for the financial specialist to make better than expected benefits (de Souza et al., 2018).

The literature of technical analysis gives abundant studies on the gainfulness of technical trading rules for specific stock exchange lists as well as in portfolios. Yet there are not many investigations concentrating on the pertinence principles of technical trading in the context of specific single stocks trading. In the currentarticle, we used rules of technical trading of moving average on single stocks which are recorded in the Pakistan Stock Exchange. As we discover MAP positive returns for the low unpredictability of shares through positive results vanish for high instability stocks.

Current paper results are comparative with Chang et al. (2014) examination of individual stocks in newly established markets; they found an exchange off amongst liquidity and productivity of variable moving average stock returns. We stated an informative association amongst instability and stock returns. The refinement between moving average and buy and hold returns (MAPs) show positive returns for beginning three quintiles reaching out from 4.53 percent to 6.73 percent, while last two quintiles exhibit an absurd reducing in MAP returns running between - 8.18 percent to - 163.33 percent. Normal achievement proportions of 39.4 percent for MAPs give huge confirmation to infer that moving average timing methodology isn't appropriate to individual stock trading. Risk-adjusted returns likewise demonstrate a comparable outcome as of crude comes back with high R-Square estimations of 44 percent overall crosswise over quintiles inferring the quality of the model and precision of results.

The author additionally pointed out that MAP return of trading lag lengths and end up getting similar results transversely on quintiles beginning at 10-day MA. The MAP return decrease until moving average 50-day, lag length when appeared differently in relation to 20-day, lag returns by then returns indicate an increasing pattern of moving average 200 and 100-day lag lengths. Therefore, we explore positive break even transaction cost for starting three quintiles and negative break-even transaction cost for last two quintiles general lag lengths; negative break-even transaction cost regards for more instability stocks reinforce our claim of moving average timing system being unsuccessful in foreseeing prices for single stocks recorded in PSE.

The remainder of this article is organized as follow: Section 2 describes the research background of technical analysis particularly in the currency market. Research methodology is given in Section 3. Section 4 explains the empirical analysis of results in the context of MA timing strategy. In Section 5 article is concluded with a discussion on MA timing strategy results.

RESEARCH BACKGROUND

Technical analysis has been utilized by professionals to estimate the future directions of security prices utilizing an assortment of recorded data variables such as opening and closing prices of securities, the volume of trading and relative ending prices too high and the low price of the day.

Pring (2014) defined the technical analysis as the craft of distinguishing pattern changes at a

beginning period and to keep up a venture or exchanging stance until the point that the heaviness of the proof demonstrates that the pattern has turned around. In this examination we use moving average which is a really fundamental procedure for conducting technical analysis; experts at first used charts with the movement of time all the more computationally difficult and systematic pointers have created to envision the future market prices in perspective of undeniable market data (Metghalchi et al., 2014). The idea of efficient market hypothesis demonstrates that all the data identified with the security is inserted in its reasonably assessed market value. So any new information is instantly reflected in its market value. As indicated by adherents of EMH, even in its weakest sort of viability market price take after an unstable walk and any exchanging models or timing system is futile to beat the market.

The previous studies of technical analysis present a great degree all around an examination on a stock list and portfolio gainfulness of specialized trading principles for individual stocks. The previous study inspected the advantage of the essential technical exchange guideline of variable moving average using single stock information from the Taiwan Stock Exchange (Chang et al., 2014). However, this investigation used trading volume as a mediator for stock liquidity and watched that variable moving average do enhance the circumstance than purchase and hold system. Additionally, they found a reducing pattern in benefits of variable moving average with enhancing trading volume for stocks indicating the tradeoff between profitability and stock liquidity variable moving average. Technical analysis researches on PSE likewise give observational confirmation to the benefit of technical trading rules. Waheed (2013) pointed out that empirical evidence of profitability of Moving Average Convergence Divergence (MACD) rule utilizing eleven scripts from the Karachi Stock Exchange (KSE). Likewise, Gunasekarage and Power (2001) indicate that factually noteworthy confirmation of technical trading analysis gainfulness utilizing the KSE-100 index.

It is the true confirmation that the literature of money market demonstrates the benefit of technical exchanging rules for particular monetary standards. Accordingly, we used currency market technical trading principles studies for single stocks. Hence, McKenzie (2007) using direct technical variable length moving average and exchanging go breakout considered seventeen emerging markets for the advantage of technical trading principles and found financial circumstances and exchanging volume information can be used to increase higher returns than the market. The currency investment in creating economies offer up to 20 percent yearly return inside seeing 5 percent yearly price and exchanging rules are consistent after some time (Chong et al., 2009). Some past researches found the more return for technical exchange rules over purchase and hold method for 25 monetary forms out of 39 inside seeing transaction cost, and they finish up the inefficiency of the market like the reason behind the achievement of technical trading rules in predicting the market (Fernández-Pérez et al., 2012; Chang et al., 2014). Tajaddini and Crack (2012) pointed out that profitability of long and short momentum system to be 1 and 3 percent separately resulting to considering the genuine trading price; they moreover demonstrate the abatement in profit for latest 5 years in the sample time span.

Coakley et al. (2016) analyzed that twenty-two monetary standards cited in USD over a time of 1996 to 2015, they extract direct exchange rules comprising of moving average and difficult exchanging rules such as Bollinger groups and related strength index as gainfulness yet later vigor test for information snooping inclination simply difficult exchanging rules like relative strength index and Bollinger band are productive especially in 10 years prior of the sample time allotment from 2006-2015 appearing towards increase in market proficiency. Similarly, Fernández-Rodríguez et al. (2003) broke down the benefits changed by using nearest neighbor non-straight pointers with MA and found that later give less gainful results inside seeing trading price and interest rate.

From the point of view of technical trading rules studies of currency markets apropos to infer that foreign exchange markets have turned out to be more effective after some time improving it hard to do than market utilizing straightforward trading rules, however, the unpredictable and further developed trading rules still give generous benefits.

RESEARCH METHODOLOGY

The author used data for the time since December 30, 2005 to December 31, 2016 from Data Stream, which involves four basic information game plan particularly (i) single stock cost of 271 stocks for trial (ii) market index of 2610 exchanging days (iii) 30-day Treasury bills rate for trial (iv) test period day by day rates. In the presentstudy, we applied R software to analyze the data.

Further, moving average technique was used to investigate specific individual stock and to explore that this MA technique is better to generate more return as compared to buy and hold strategy for an individual stock. Firstly, it is computed that step by step returns an annualized standard deviation using condition 1 and 2 for particular individual stock and we design a framework for a stock return much significant as 300 percent, and zero percent was the standard deviation.

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}} \qquad \textit{(Eq. 01)}$$

Where,

R_t=Return of individual stock

P_t=Current price of stock

P_{t-1}= Price of stock on one day before the current price

$$Sd_t = \frac{(R_t - R_t)}{N} \qquad \textit{(Eq. 02)}$$

SD_t = Standard deviation at current day

R_t = Return of current day

$\overline{R}_t$ = Average Return of stock for one year

N = Number of trading days in a year

Using equation 3, we calculate that MA returns of 10-day of individual stock using a screening process for uan ndefined period.

$$\mathbf{X}_{t,L} = \frac{P_{t-(L-1)} + P_{t-(L-2)} + \ldots\ldots P_{t-1} = P_t}{L} \qquad \textit{(Eq. 03)}$$

Where;
A certain trading day=t
Lag length (10 days)=L

Moving average is used to settle on a speculation choice, to place assets into the market or put resources into risk-free securities. Buy signals are caught on the traverse of a day ago stock value record and most recent ten days moving average list for instance last day stock price is greater than the past ten days moving average index, then technical rules of moving average exclude the purchase signal otherwise it considers the important signals to invest in the risk free securities. The trading technique relies upon the possibility that; if yesterday stock value (Pt) is more vital than latest ten days moving average (X it, L), the investors exist in the trading market and get market attractive returns by investing their resources in treasury securities and obtained risk-free rate in the market and win market prevailing returns, for the most part, put resources into treasury securities place assets into Treasury securities and pick up risk free rate. Experimentally, this trading method can be expressed as under:

$$Rt,L = \begin{cases} R_{jt} & \textit{if } P_{jt-1} > X_{jt-1,L} \\ R_{ft} & \textit{otherwise} \end{cases} \qquad \textit{(Eq. 04)}$$

Where;

Security or portfolio return by using the method of moving average at day t=$R_{it,L}$
Stock index price i at one trading day before specific day t=P_{jt-1}
Stock index of moving average price j as one trading or exchange day before day t=$X_{jt-1,L}$
A certain trading day= T
The risk-free rate at day t =rft

Now using equation 5, MAP returns calculated for individual stocks utilizing MA return of 10-day and return of purchase and hold in light of purchase signals.

$MAP_{it,L} = R_{it,L} - R_{it}$ (Eq.05)

Where;
Excess return of MA timing strategy for particular stock i day t =$MAP_{it,L}$
Stock MA returns i of particular day and t by using lag length L=$R_{it,L}$
Stock or portfolio index (buy and hold returns) at day t=R_{it}

In the wake of calculating MAP returns we make five quintiles in light of single stock's standard deviation, as establishing the portfolio this study presents three distinctive return such as (i) purchase or hold technique return (ii) the MA timing approach return (iii) the MAP returns of each portfolio as designed in last step, besides that it presents the calculations of T-state, Skewness, standard deviation and Sharp ratio of the portfolio. So, the outcomes are shown in Table 1. It is used for looking at plenitude of MA timing system returns over the purchase and hold philosophy. In wake of separating the benefit of MAP unrefined returns, we applied CAPM on MAPs comes back to ascertain risk-adjusted returns, and we look at gainfulness of MAP risk-adjusted is given in Table 2.

In order to examine the strength of our outcomes, this study applied two approaches first, BETC and alternate lag lengths. Thus, we compute the lag lengths of 200, 100, 50 and 20 days to look at the influence having a lag length in the context of firms' gainfulness of MA timing method returns. Therefore, these results are presented in Table 3, along with additional examination of arbitrary trading methodology. At last in Table 4, we calculate trading frequency, holding periods and BETC to separate the capability of MA timing system inside seeing transaction cost.

ANALYSIS AND RESULTS

In the current segment, this article introduces the risk-adjusted as well as raw returns of MA timing portfolios which are shown in Table 2 and Table 1 respectively. Hence, all Tables are given in appendix 1. Table 1 describes the average returns for single stocks as well as returns on MA (10) approach. The parallel MAP characterized in five classes as an increased capacity as the volatility of the individual stock. The examination is conducted on single stocks and amassed in light of single stock instability. The Sharpe ratio and skewness are used to contrast and disentangle the outcomes.

In such a manner, group A, Table 1 describes average returns along with fundamental features of the purchase and hold procedure regarding individual stock quintile. Therefore, annually normal returns distinct and are insignificant as 14.45 percent to most dumbfounding 92.69 percent. As a colossal augmentation subsequently initiated from 4th quintile to the most imperative instability quintile. Thus, in purchase and hold procedure, the qualification between the most lifted and the slightest quintile was normal 78.24 percent every year that is extremely important. However, skewness of group A shows numbers as negative with exceptions for the most shocking capriciousness design of portfolio. Thus, Skewness is started from the lowest - 0.33 to 0.28. In addition, Sharpe proportion rates normal returns in the plenitude of risk-free rate as per unit of total risk. Group A obviously exhibit that Sharpe proportions are essential particularly the most raised quintile with Sharpe proportion as a 2.71. However, it is found that no distinction in the results of individual stock and portfolio strategy.

Parallel to group A, and group B address the eventual outcomes of the 10 days, MA approach on the single stock. Separation in the results of group A, and 10-days moving average arrangement in respect of portfolio approach. The benefits of moving average timing technique for single stocks increment by the fundamental three quintiles and diminish through last second quintiles. It emerges from a portfolio strategy that the moving average returns on starting third quintiles are greater than the profitability of group A. While lesser than the moving average return in the context of Portfolio approach. For instance, for the smallest quintile starting is 18.98 percent that is greater comparative to 14.45 percent in group A, and lesser than moving average returns in portfolio approach that is 18.98 percent relative to 21.75 percent. The rot from the third quintile to the most imperative quintile was colossal. Particularly the moving average returns of most puzzling quintile were a great degree of separation to the moving average return of portfolio approach, - 70.64 percent versus 86.66 percent. Thusly, the moving average timing framework isn't functioning estimably on the single stock clarification behind more erratic stocks. Moreover, the moving average timing quintiles show an identical parameter, regardless, all the positive skewness over capricious quintile. Therefore eventual outcomes of Sharpe ratio for moving average timing quintile is extensively greater than for the purchase and hold quintile alongside the most astounding quintile showing -4.44 percent as Sharpe ratio.

Group C present results of MAPs that enlightens benefit of moving average timing technique over the purchase and hold philosophy. Move to the portfolio philosophy, the results in group C are not enormous 1 to 4 quintiles, going from -8.18 percent to 6.73 percent. The MAP return on the 4th quintile and the most critical quintile are both negative. MAP return of -167.86 percent for the most raised quintile again displays the MA philosophy isn't working wonderfully on high capricious individual stocks. So also, to portfolio philosophy, the skewness in group C is expansive and positive aside from the most vital shaky quintile. The achievement degrees are all underneath half and with typical 39 percent over the quintiles. Along these lines, the moving average framework is likely not going to be profitable on solitary stock estimation. For the most part, the MA method isn't effective in passing on constantly basic returns comparable to purchase and hold framework for solitary stocks. For low capriciousness level, the moving average timing strategy beats the purchase and-hold framework. In any case, for high shakiness level, the moving average framework fails to meet wants at that time of purchase and-hold technique. In addition, high t-statistic of all values are given in Table 1which demonstrate the results are exceptionally significant. Low accomplishment ratio revealed moving average strategy isn't any doubt going to propel through all quintiles.

Table 2 shows the eventual outcomes of betas, alphas, and adjusted R-square by figuring CAPM regression in perspective of 10-day MAPs. The developments of alpha by growing unusualness take after an indistinct case from returns on 10-day MA strategy through all quintiles. The alphas increment over the initial three quintiles and diminishing after. Showed up distinctively in connection to a portfolio approach, the alphas are sure and respectably negligible over the fundamental three quintiles, going from 5.62 to 8.82, the alphas of the fourth quintile and the most raised quintile are negative and essentially not as much as that for portfolio approach, - 5.44 versus 20.30 and -160.69 versus -10.33 only. The negative alphas are depended upon to disregard to meet the expectation of MA strategy for high precarious gathering particular stocks. Resultantly, alpha between the most basic and least quintile is stunning negative. T-statistic are more obvious than 2 or not decisively -2 aside from the fourth quintile (-1.67) which shows that most characteristics are statistically significant.

In portfolio philosophy, the individual stock strategy has amazingly comparable and irrelevantly more noteworthy betas. Here is a slipping case through fundamental four quintiles from - 0.22 to - 0.55 and a little move for most lifted quintile - 0.53. Thus, negative betas exhibit that augmentations in risk premium have a negative effect on the MAPs, and the financial experts are in all likelihood going to place investments into risk-free as opposed to trading in securities markets.

The outcomes of adjusted R-squares demonstrate sureness that execution of the framework can be cleared up by variables. In portfolio strategy adjusted R-squares for the single stock are seen as for all intents and purposes indistinguishable or more prominent. This demonstrates the CAMP can describe a more unmistakable measure of results under single stock strategy than that under portfolio philosophy a typical 43.39 percent adjusted R-square across quintiles displays that 43.39 percent of the results can be cleared up alongside of the risk exposures as measured through beta. Similarly, in the portfolio approach, adjusted R-square of most puzzling flimsiness quintile is low 18.26 percent.

DISCUSSION AND CONCLUSION

The author illuminate about the power of the MA timing technique's profitability for the individual stocks recorded in PSE in the joining segment by pondering elective lag lengths, with the target of exploring MA timing system and BETC estimation.

Lag lengths of alternate moving average

Table 3 demonstrates the profitability of individual stock quintiles applying 200-, 100-, 50- and 20-day moving average. Plainly the results resemble the 10-day moving average technique i.e. the average or ordinary returns, and additionally, the CAPM alphas are negative. Table 3 stated that diminish in typical returns and CAPM alphas of individual stocks with an extension in lag lengths. For instance, the typical individual return for the most decreased quintile for the 20-day lag is 6.59 percent anyway it is 5.02 percent for the same quintile for 200-day lag. The last section of Table 3 shows the results of discretionary trading methodology. This framework switches, by sporadic likelihood between the buy and hold and risk-free T-bills. It produces negative results along the quintiles with -3.40 percent being the base quintile's annualized typical return while -42.65 percent is the annualized ordinary or average return of the hugest quintile.

Dominatingly, it can be spread out that the buy and hold framework beats the moving average arranging approach of quintile particular individual stock for high insecure portfolios. This is one the striking typical for the individual stock examination. This segment is overwhelmingly an outcome of the higher bustle in particular stocks examinations with that of the portfolio.

Trading frequency, break-even transaction cost (BETC) and average holding period

The results in Table 4 shows average or ordinary holding periods, trading rehash and BETC transversely finished distinctive lag lengths of moving the average system in light of individual stocks. It is obviously demonstrated that for same level unusualness, the holding days increment as the lag length increment. For example, the holding time of the least quintile is 37.88, 50.37, 77.85, 98.33 and 154.39 only from 10-day MA to 200-day MA unmistakably showing a growing trend. As opposed to the portfolio approach, the individual stock approach generally has a more drawn out holding period each taking a gander at lag length and wobbliness. The central exception 121.81 for portfolio approach is under 165.30 positions in second precariousness with a lag length of 200 which is irrelevant.

The trading repeat of results can be immediately seen as the lengths of holding days. For a relative lag length, the more days the stocks are held, the less unremitting the stocks are exchanged. The trading repeat of 10-day MA is around 5 percent of the aggregate days and 200-days MA is around 0.9 percent of the aggregate days. The reason is that there is an extending limit of holding days by increment the lag length, so everything considered the outcomes for a trading repeat are littler as the lag length increment. For a near reason, the results of trading frequency are less than unusualness level and lag length emerged from a portfolio philosophy.

Thus, two factors that impact the result of break-even transaction cost, the entry on moving average and the number of trading days. As the number of trading days can't be negative, negative moving averages cause the negative break-even transaction cost. Breakeven transaction cost displays the breakeven point that the advantage can manage the transaction cost. In Table 4, most results of break-even transaction costs are negative and negative characteristics show the moving average philosophy isn't gainful considering transaction costs showed up contrastingly in connection to buy and hold framework. Generally saying that the degree of break-even transaction costs increases as the lag length increase and the precariousness increase. For positive break even transaction cost, a gigantic piece of them are practically nothing and the immense results for 200-days MAI are an immediate consequence of less trading frequency. Henceforth, there is no main thrust to utilize moving average system for making investments in groups of individual stocks.

CONCLUSIONS

In this paper, the author used MA timing philosophy on solitary stock returns of stock recorded in PSE. We find flawed insistence to report a profit of MA timing procedure. As emerged from its farsighted point of confinement concerning unsteadiness composed portfolios, MA timing strategy shows the fragile keen breaking point as for solitary stocks and thus neglects to persuade steady higher returns to buy and hold approach. In any case, the eventual outcomes of our examinations are steady with (Coakley et al., 2016) and (Fernández-Rodríguez et al., 2003) disclosures of moving average farsighted farthest point in real money markets. In the context of our disclosures, we can argue that individual stock returns are noisier than portfolio stock returns; our finding can be utilized to conduct more future studies of technical trading rules in predicting stock returns.

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APPENDIX-1

Table 1. Profitability of individual stocks

	Group A. *Volatility Quintile individual stocks*				***Group B.*** *MA (10) Timing individual stocks*				***Group C.*** *MAPi*			
Rank	Avg Ret	Std Dev	Skew	S. Ratio	Avg Ret	Std Dev	Skew	S. Ratio	Avg Ret	Std Dev	Skew	Success
Low	14.45 (4.28)	10.12	-0.33	0.68	18.98 (11.37)	5.01	0.32	2.29	4.53 (1.84)	7.38	0.42	0.43
2	15.22 (3.35)	13.64	-0.48	0.56	21.95 (9.83)	6.70	0.27	2.15	6.73 (2.10)	9.59	0.60	0.42
3	23.07 (4.29)	16.14	-0.49	0.96	29.65 (11.25)	7.91	0.30	2.80	6.58 (1.76)	11.21	0.78	0.40
4	25.32 (3.69)	20.56	-0.37	0.87	17.14 (4.99)	10.29	0.58	0.93	-8.18 (-1.71)	14.35	0.75	0.41
High	92.69 (8.84)	31.46	0.28	2.71	-70.64 (-12.02)	17.62	0.79	-4.44	-163.33 (-20.7)	23.68	-0.27	0.31
High - Low	78.24 (8.06)	29.11	0.67	2.43	-89.63 (-15.86)	16.96	0.80	-5.73	-167.86 (-22.50)	22.37	5.24	0.27

Table 2. CAPM

Rank	***Group A. CAPM***		
	A	βMKT	Adj.R2 (%)
Low	5.62 (2.77)	-0.22 (-33.30)	32.15
2	8.57 (3.96)	-0.37 (-52.72)	54.30
3	8.82 (3.67)	-0.45 (-57.50)	58.57
4	-5.44 (-1.67)	-0.55 (-52.06)	53.68
High	-160.69 (-22.51)	-0.53 (-22.88)	18.26
High - Low	-166.31 (-23.12)	-0.31 (-13.31)	7.01

Table 3. Alternate Moving Averages Lag Lengths

	MAPi (20)		MAPi (50)			MAPi (100)		MAPi (200)		Random Switching
Rank	Avg Ret	CAPM α	Avg Ret	CAPM α	Avg Ret	CAPM α	Avg Ret	CAPM α	Avg Ret	CAPM α
Low	6.59 (2.72)	7.50 (3.75)	4.83 (2.08)	5.65 (2.94)	5.04 (2.32)	5.70 (3.13)	5.02 (2.55)	5.42 (3.28)	-3.40 (-2.02)	-2.50 (-2.03)
2	6.68 (2.09)	8.25 (3.81)	5.35 (2.71)	6.79 (3.23)	5.71 (1.88)	6.90 (3.34)	6.64 (2.21)	7.46 (3.69)	-3.75 (-1.65)	-2.30 (-1.73)
3	6.75 (1.80)	8.65 (3.58)	4.11 (1.11)	5.86 (2.43)	2.56 (0.70)	4.05 (1.70)	4.83 (1.27)	5.92 (2.45)	-7.67 (-2.85)	-5.93 (-3.91)
4	-7.30 (-1.50)	-4.93 (-1.50)	-5.48 (-1.12)	-3.26 (-0.97)	-4.50 (-0.90)	-2.58 (-0.74)	-4.55 (-0.87)	-3.15 (-0.87)	-8.91 (-2.60)	-6.84 (-3.12)
High	-158.03 (-19.83)	-155.77 (-21.61)	-143.36 (-17.64)	-141.17 (-19.25)	-130.78 (-15.64)	-128.92 (-16.98)	-116.46 (-13.26)	-115.06 (-14.49)	-42.65 (-8.14)	-40.68 (-8.85)
High - Low	-164.62 (-21.76)	-163.27 (-22.40)	-148.19 (-19.17)	-146.82 (-19.80)	-135.84 (-16.86)	-134.61 (-17.44)	-121.48 (-14.35)	-120.48 (-15.00)	-39.25 (-8.09)	-38.18 (-8.19)

Table 4. Trading Frequency and BETC

	MAI (10)			MAI (20)			MAI (50)			MAI (100)			MAI (200)		
Rank	Hold Per	Tradfreq	BETC	Hold	TradFreq	BETC	Hold Per	TradFreq	BETC	Hold Per	Trad Freq	BETC	Hold Per	Trad Freq	BETC
Low	37.88	4.87	3.49	50.57	3.23	30.38	77.85	1.83	52.15	98.33	1.29	59.40	154.39	0.83	108.98
2	18.50	5.66	27.18	27.58	3.83	41.19	46.11	2.27	58.12	73.66	1.43	19.19	121.81	0.88	56.70
3	27.31	5.07	9.35	39.88	3.30	2.38	74.34	1.92	25.95	101.56	1.33	42.47	152.81	0.89	143.91
4	39.38	5.03	-0.30	56.06	3.47	-6.76	78.64	2.12	-28.36	124.42	1.37	-67	153.40	0.99	-41.12
High	24.59	5.43	-659.86	34.37	3.90	-857.00	58.47	2.46	-1163.10	77.10	1.83	-1467.14	111.46	1.31	-1820.40