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PEAK CAPITAL TRADING

The Art of Financial Illusion

How to Use Martingale Betting Systems to Fool People

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Abstract

In this paper, we undertake a comprehensive exploration of the financial scam landscape, focusing particularly on the use of Martingale betting systems and their role in artificially inflating the perceived short-term profitability of trading strategies. We trace the evolution of financial deception from the primitive practices of coin clipping to the sophisticated schemes of modern Ponzi operations, shedding light on the enduring patterns of exploitation and deceit that characterize financial fraud. Central to our analysis is the Martingale system, a method of progressively increasing investments after losses, devised in 18th-century in France. We critically examine its application in contemporary trading and how it creates an illusion of early success to mislead investors. A significant contribution of this paper is the demonstration, through statistical analysis and historical simulations, of how a trading system can seemingly generate a 20% annual return with nearly 80% probability, despite its reliance on randomly generated trading signals. Our research provides an in-depth analysis of the anatomy of financial scams, delving into their psychological and sociological foundations. We aim to equip readers with a comprehensive understanding of these deceptive practices, offering valuable insights for their detection and prevention. This paper is not just an academic exercise but a practical guide aimed at enabling investors, regulators, and the wider public to navigate the complex and often treacherous terrain of the financial world with greater awareness and discernment.

Keywords: *Robo Trading, Trading Scam, Algo Trading, FX BOT, Martingale, Gambling, Fraud.*

1 Introduction

The history of financial scams is as old as currency itself [1]. In ancient times, one of the simplest yet effective forms of scam was coin clipping. Practitioners would shave off small quantities of precious metal from coins, gradually accumulating wealth while devaluing the currency in circulation. Similarly, the practice of selling public offices and titles, particularly prevalent in ancient Rome and Renaissance Europe, exemplifies early instances of institutionalized corruption and fraud. These offices, often sold to the highest bidder, became tools for further extortion and bribery, setting a precedent for the misuse of power in financial scams. Moving forward in history, the Tulip Bulb Scam or Tulip Mania of the 17th century serves as one of the earliest examples of a speculative investment bubble [2]. Prices of tulip bulbs in the Netherlands skyrocketed based on irrational market exuberance, only to collapse spectacularly, leaving many investors in financial ruin. Similarly, the Mississippi Scheme of the 18th century, orchestrated by John Law, was a classic case of over-promised returns from investments in the Mississippi Company, leading to one of the first major stock market crashes [1].

These historical scams share striking similarities with modern financial frauds, particularly Ponzi schemes. Named after Charles Ponzi, who in the early 20th century duped investors with the promise of high returns from a postage stamp speculation scheme, Ponzi schemes operate on the principle of paying earlier investors with the funds from newer investors. This model creates a facade of a successful investment strategy, enticing more people to invest. As these schemes grow, they become increasingly unsustainable, ultimately collapsing under their own weight. All these examples demonstrate that financial scams have a long history, evolving in sophistication over time but always based on the principles of deceit and exploitation [1].

In the modern financial world, now more accessible to a wide range of individuals, particularly after COVID-19, the issue of financial scams has become more pressing and intricate, continuing to pose a significant challenge for regulators. Although the techniques and complexity of financial scams have advanced throughout history, their fundamental principles are still based on trickery and manipulation [3].

In this paper, we aim to unravel the underlying patterns and tactics used by fraudsters and mathematically show how they work. This paper aims to systematically dissect the statistical underpinnings of these scams, with a particular focus on how they ensnare a select group of *winners* to create an illusion of profitability and legitimacy, thereby attracting additional investors. We explore the psychological and sociological factors that make individuals vulnerable to such scams and how scammers exploit these vulnerabilities. Using a Martingale betting systems on the Nasdaq 100 Index, we aim to provide a simple yet comprehensive understanding of the anatomy of financial scams, offering insights into their detection and prevention. A significant part of this analysis will delve into how the Martingale betting system, a strategy of doubling down on bets after each loss, is used in modern financial scams. This system, when applied in investment schemes, can be misleadingly attractive while exposing investors and traders to substantial risks. In financial scams, the Martingale betting system is often exploited to fabricate an illusion of high profitability. This technique can misleadingly transform insignificant trading signals into seemingly lucrative financial products, projecting an impressive 20% annual return with an almost 80% probability. Such manipulation effectively constructs a false appearance of efficacy and success.

The intricate aspect of these scams is how they benefit the orchestrators and scammers, particularly through the accumulation of massive fees and service charges. The scammers capitalize on both the winnings of the successful group and the contributions of the losing group, thereby ensuring their profit regardless of the investors' outcomes. This paper aims to dissect these dynamics, offering a statistical and psychological exploration of why such schemes attract investors and how they are systematically structured to benefit the fraudsters at the expense of the majority. Our goal is to shed light on these deceptive practices, providing insights for investors and regulators to identify and prevent such scams in the financial landscape.

2 Martingale Betting System and Trading

The Martingale betting system is an investment strategy where the dollar value of investments continually increases after losses, or the position size increases with a decreasing portfolio size. Originating from 18th-century France, introduced by French mathematician Paul Pierre Levy [4, 5], and further examined by American mathematician Joseph Leo Doob, the Martingale system was initially intended for gambling. Doob's work aimed to disprove the feasibility of a 100% profitable betting strategy [6].

At its core, the Martingale system operates on the premise that only one successful bet or trade is needed to reverse a string of losses. Commonly applied in gambling, it has found its way into trading strategies in modern financial markets. The system involves doubling the bet (or trade size) after every loss, with the belief that any subsequent win will recover all previous losses and yield a profit equivalent to the original stake.

In a trading context, this strategy implies progressively escalating the capital risked in a position following consecutive losses. The expectation is that an eventual winning trade will offset all prior losses. For instance, if a trader loses \$100 on the first trade, then doubles the stake to \$200 on the second trade and loses again, the total loss is \$300. If the trader then bets \$400 on the third trade and wins, the total profit is \$100, recouping all previous losses. However, this betting method is fraught with significant risks, mainly the rapid depletion of trading capital before a winning trade occurs. It presumes an infinite amount of capital and unrestricted trade sizes, which are not practical in real-world trading.

Table 1 illustrates the implementation of the Martingale betting strategy in a trading setting across 10 trades, starting with an initial equity of \$100,000. The strategy dictates that the trader sets both a stop loss and a profit target at equal distances. The initial trade risks \$1,000. Following a loss, the strategy requires doubling the risk amount; for instance, after one loss, the trader would risk \$2,000. After a winning trade, the risk amount resets to \$1,000.

Table 1: Illustration of a Martingale betting strategy applied to trading. The table shows equity before and after each trade, the risk amount, outcome, and profit or loss (PnL) for each trade sequence.

Trade #	Equity ($)	Risk ($)	Outcome	PnL ($)	Equity ($)
1	100,000	1,000	Profit	1,000	101,000
2	101,000	1,000	Loss	-1,000	100,000
3	100,000	2,000	Profit	2,000	102,000
4	102,000	1,000	Loss	-1,000	101,000
5	101,000	2,000	Loss	-2,000	99,000
6	99,000	4,000	Loss	-4,000	95,000
7	95,000	8,000	Loss	-8,000	87,000
8	87,000	16,000	Loss	-16,000	71,000
9	71,000	32,000	Loss	-32,000	39,000
10	39,000	39,000	Profit	39,000	78,000

As exhibited in the first row of Table 1, the first trade results in a win, boosting the equity to $101,000. However, the second trade ends in a loss of $1,000. In the third trade, the risk is increased to $2,000, resulting in a profit that not only recovers the previous loss but also elevates the equity to $102,000. From the fourth trade onwards, the trader faces a string of 6 consecutive losses, necessitating a doubling of the bet size with each trade. As depicted in the table, this leads to a sharp decline in equity, plummeting to $39,000 by the ninth trade. For the tenth trade, the Martingale strategy would advise doubling the last bet (from $32,000 to $64,000), but the available equity is insufficient. Fortunately, the tenth trade is a win, but due to limited capital, the trader only partially recovers the losses, leaving the account with an overall loss of 22% (from $100,000 to $78,000). Had the tenth trade also resulted in a loss, the trader would have been at risk of depleting the entire capital.

In the realm of financial scamming, the Martingale system is often misrepresented as a foolproof method for achieving consistent profits. Scammers may use this system to entice individuals into fraudulent investment schemes, promising high returns with minimal risk. They might not disclose the system's inherent risks, such as the potential for significant losses and the requirement for substantial capital to sustain a long string of losses.

3 Trading System Definition and Assumptions

While many scams are centered around FX trading, our study employs the Nasdaq 100 index, QQQ as the trading instrument. This aligns with our prior research which has focused on intraday trading strategies involving QQQ [7, 8]. The prevalence of automated bots in FX is justified by the high leverage allowed by brokers in this asset class (especially brokers operating outside regulated markets where regulations are less stringent). Typically, Trading Bots use brokers that provide a leverage up to 500:1. In contrast, the maximum leverage for major currency pairs allowed by U.S. regulated brokers is usually capped at 50:1.

In our research, we utilize QQQ with a maximum leverage of 500:1, simulating conditions conducive to the strategies employed by these bots. We have also factored in a commission rate of $0.0005 per share for a more realistic trading scenario. All backtests and simulations are conducted using Matlab with data sourced from IQFeed.

4 Trading Strategy Definition

In this section, we devise a straightforward strategy that, despite being grounded in purely random signals, demonstrates the capability to produce seemingly impressive, yet ultimately deceptive, trading results. The ultimate goal of the strategies described in the following section is to artificially increase the probability of reaching 20% per year, even deploying randomly generate signals [9].

4.1 A Trading Strategy with a Random Signal

Our base strategy involves executing one trade per day within regular trading hours, randomly assuming either a long or short position at a random time of day. Each trade employs a leverage ratio of 1:1. Along with initiating a new position, we set both a profit target and a stop loss, each at a distance of $0.20 from the entry price. In cases where neither the target nor the stop loss is triggered, we close the position at 4 PM.

On December 31, 2021, we initiated 10,000 accounts, each capitalized with $1,000, exe-

Table 2: Performance metrics of the Random trading strategy over 10,000 accounts.

#	Strategy Name	Accounts	Winners	Losers	>20%	Gain:Loss
1	Random	10,000	47%	53%	0%	0.96

cuting the aforementioned strategy. Due to the strategy's random signal generation, the equity trajectories of these accounts varied.

Table 2 provides an overview of the accounts' performance. Approximately 47% of the accounts realized a positive return, whereas 53% concluded the year with a balance below their initial $1,000. This higher frequency of unprofitable accounts is largely attributed to trading commissions. Notably, no account achieved an annual return of 20% or more. The average loss among the losing accounts exceeded the average gain of the profitable ones, primarily due to commission costs.

This outcome aligns with our expectations. After conducting a vast number of simulations, it becomes evident that a strategy rooted in random signals tends to yield returns that are randomly distributed, but with a negative shift owing to transaction costs. This leads us to a critical inquiry: how can we improve the base random strategy to increase the probability of being in profit after 1 year?

4.2 A Trading Strategy with a Random Signal and a Martingale Approach

In this adaptation, we retained the original trading signals but altered our approach to leverage management. Following a loss, we doubled the leverage for the next trading day. After a winning trade, the leverage reverts to 1:1. This method incorporates the Martingale betting system principles. Our profit targets and stop-loss orders remain consistently set at $0.20 from the entry price.

On December 31, 2021, we launched this strategy across 10,000 accounts, each with an initial capital of $1,000. As exhibits in Table 3 the proportion of profitable accounts

Table 3: Performance metrics of the Random trading strategy over 10,000 accounts.

#	Strategy Name	Accounts	Winners	Losers	>20%	Gain:Loss
1	Random	10,000	47%	53%	0%	0.96
2	Random + Martingale	10,000	84%	16%	0.9%	0.19

increased to 84%, but the higher number of profitable accounts came with an increased average loss for the losing accounts. Despite this, the proportion of accounts achieving a 20% annual return remained low at around 1%.

In essence, while the adoption of the Martingale strategy led to a higher number of profitable accounts over a one-year period, it proved insufficient in consistently reaching the ambitious target of a 20% annual return.

4.3 A Trading Strategy with a Random Signal and a Martingale Approach

The objective of our strategy is to achieve a 20% annual return across as many accounts as possible. Starting with an initial capital of \$1,000, our goal is to attain a final wealth of \$1,200, which translates to an annual profit of \$200. The most efficient approach to reach this year-end target is by accruing an average of \$200/252 (i.e. \$0.79) profit per day. The ideal Asset Under Management (IdealAUM) trajectory, which we aim to follow, is illustrated in Figure 1. After t days, the Ideal AUM is calculated as follows:

$$IdealAUM_t = \$1,000 + \frac{\$200}{252} \times t$$

Our strategy attempts to closely follow the ideal trajectory shown in Figure 1. By leveraging the framework of previous strategies and incorporating a simple mathematical adjustment, we determine the number of shares to trade daily. This calculation ensures that, upon hitting our target, the AUM aligns with the Ideal AUM for day t.

For instance, on the first trading day, we aim for an Ideal AUM of \$1,000 + \$0.79 by day's end. The trade is calibrated so that in case the first trade reach the profit target,

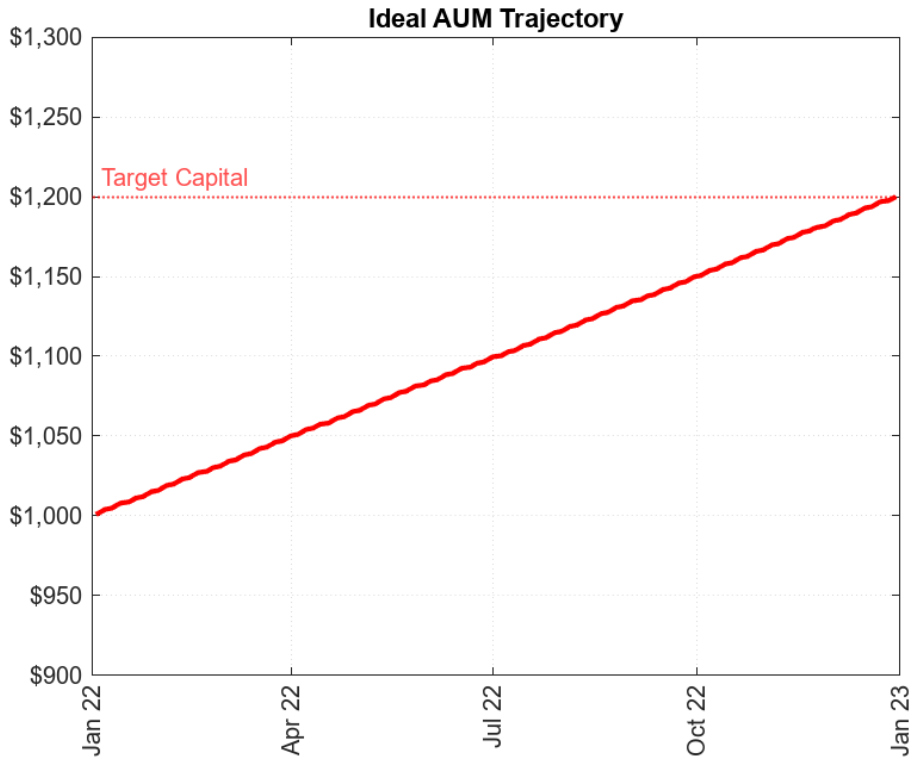

Figure 1: The ideal trajectory of the AUM of a portfolio with a 20% annual target.

the end-of-day AUM is equal to the ideal AUM. Using basic calculations, we determine the shares traded on day t as:

$$Shares_t = \frac{IdealAUM_t - AUM_{t-1}}{\$0.20},$$

where \$0.20 represents the profit target for the trade. At first glance, this formula may seem opaque, but it essentially implies that losses lead to increased leverage in subsequent trades—a hallmark of the Martingale approach. Consecutive losses widen the gap between AUM_{t-1} and $IdealAUM_t$, necessitating a larger number of shares to trade the following day.

Like our previous sections, on December 31, 2021, we deployed this strategy across 10,000 accounts, each starting with \$1,000. The strategy continues to employ a random entry technique with a \$0.20 target and stop. As exhibited in Table 4, the new implementation of the random entry strategy was able to achieve the 20% return on 73% of the accounts,

Table 4: Performance metrics of the Random trading strategy over 10,000 accounts.

#	Strategy Name	Accounts	Winners	Losers	>20%	Gain:Loss
1	Random	10,000	47%	53%	0%	0.96
2	Random + Martingale	10,000	84%	16%	0%	0.19
3	Random + Martingale +Target	10,000	77%	23%	73%	0.29

a remarkable achievement compared to previous strategies. The portion of profitable account remains very high (77%) while the Gain:Loss improved slightly from strategy 2.

Upon close examination of the simulations, we observe that a majority of the accounts reached a Sharpe Ratio above 2, a notable figure considering the historical Sharpe Ratio of the S&P 500 is around 0.80. Some accounts display AUM trajectories so stable they could falsely suggest the use of a *Holy Grail* signal. However, we know these results are derived from a strategy based on a random BUY/SELL signal.

The final result is what attract investors; the *magic* indicator that is behind these impressive performance is not unveil and here is where the scam start taking form.

5 The Scammer's Business Plan

Having explored how a Trading Bot Provider can create a portfolio based on random signals capable of yielding a 20% annual return, we present a fictional business plan. This plan outlines steps for a Trading Bot Provider planning to promote fraudulent services online over a period of 10 years, starting from 2013. The objective is to manage other people's money, earning revenue through a fixed management fee and a performance fee applied only if clients realize profits.

5.1 Build a Track Record

In the asset management industry, individuals who wish to promote their money management services to potential investors are required to provide sufficient proof of their skills. In other words, potential investors need a certified track record that demonstrates the trading strategy has been tested in real markets and the results confirm its effectiveness.

Table 5: Performance statistics of 10 accounts traded in 2012 with a strategy based on random entry signals, a martingale approach and a annual target of 20%

Account	PnL ($)	Total Return	Volatility	Sharpe Ratio	MDD
1	176	18.0%	43%	0.4	27%
2	195	20.0%	12%	1.7	4%
3	200	20.0%	20%	1.0	9%
4	200	20.0%	23%	0.9	9%
5	200	20.0%	73%	0.3	35%
6	200	20.0%	66%	0.3	36%
7	200	20.0%	32%	0.6	18%
8	200	20.0%	7%	3.0	2%
9	-550	-55.0%	47%	-1.2	59%
10	-806	-81.0%	74%	-1.1	81%

The simplest method used by the fraudster to create a profitable certified track record is to open 10 trading accounts with a well-known broker, funding each account with a small amount of capital. For simplicity, let's assume each account is funded with $1,000. Starting on January 1, 2012, each account begins trading based on randomly generated signals, using the martingale methodology, and aiming for a 20% annual return (as per Strategy 3 in Table 4). Each account follows its own trajectory due to independent signals.

Table 5 summarizes the year-end results for each trading account. 8 out of 10 accounts were profitable, while 2 accounts incurred significant losses of 55% and 81%, respectively. Despite these substantial losses, the aggregate yearly profit and loss (PnL) across all accounts amounted to a positive $215—a lucky year indeed! Overall, 6 accounts achieved the targeted return of 20%, with account 8 emerging as the top performer, boasting a yearly volatility of just 7%, a Sharpe Ratio of 3, and a Maximum Drawdown of only 2%.

The performance of account 8 is displayed in Figure 2, which, along with a certified report of all transactions, will be used to showcase the strategy to prospective investors. The equity curve of this account is particularly noteworthy for its linearity and resilience. Every decline is quickly absorbed, leading to a trajectory that closely aligns with the ideal equity curve, as indicated by the dotted red line.

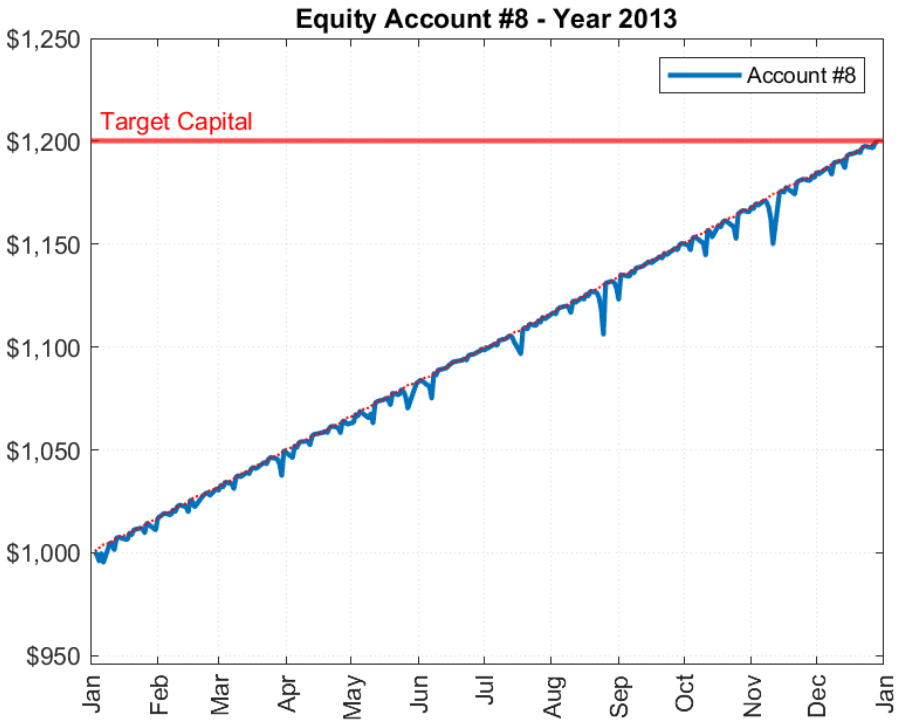

Figure 2: Equity line in year 2013 for Account 8.

5.2 Find clients and exploit behavioral biases

A certified track record exhibiting a trajectory as in Figure 2 would likely capture the interest of investors seeking effortless, high-return investment opportunities. For simplicity's sake, let's assume each client subscribing to the Robo service agrees to initiate their account with a $10,000 investment. Additionally, they consent to pay the Robo provider an annual management fee of 1% and a performance fee of 25% on any profits accrued over the year.

In year 1, we assume that the Trading Bot Provider finds 100 clients interested in investing in his strategy, promoted using the equity line exhibited in Figure 2. After the first year, no further promotion would be conducted, and the number of clients would grow only through word-of-mouth by clients. We assume that at the end of each year, a client with a profitable account would not only continue to invest in the strategy but also bring in a new client. Conversely, a client that experienced a loss would close his account. This simple model for estimating the number of clients bases its roots in a few

behavioral biases that have been observed in the trading industry:

Self-serving bias: it occurs when people tend to attribute successes to skills and qualities, while attributing failures to external factors or bad luck. In the context of gambling or trading, this manifests as hiding losses and excessively highlighting successes, creating a distorted image of the real-world trading opportunity set.

Emotional Avoidance: this bias manifests when investors showcase a selective transparency, eagerly sharing and highlighting their profitable investments while quietly concealing their losses. It's akin to the casino-goer's tendency to broadcast their winnings to friends while remaining silent about their defeats. In the realm of trading, this can lead to an imbalanced narrative that amplifies successes and minimizes setbacks. Such a pattern mislead friends and followers by presenting a biased picture of the real trading industry.

Fear of Missing Out (FOMO): this is observed when investors jump into investments without adequate knowledge, lured by seeing others reap substantial profits. It's driven by a potent combination of bandwagon mentality and Fear of Missing Out (FOMO). Investors influenced by FOMO may abandon their due diligence in the haste to not miss out on what they perceive as a surefire investment. This can lead to ill-considered decisions based on hype rather than sound financial analysis. Succumbing to this fear can expose investors to significant risks, as they might be entering risky investments with fundamentals they do not fully understand.

Using historical data of QQQ from 2013 to 2023, we simulated the yearly cashflows and performance of the accounts managed by the Trading Bot Provider. As exhibited in Table 6, after the first year, 77 clients were profitable while 23 clients lost money and closed their accounts. Overall the clients paid a total of $47,348 to theTrading Bot Provider though the aggregate PnL across the accounts was negative, -$55'949. Despite the lackluster performance in terms of aggregate PnL, 77 clients managed to achieve a 20% return. These clients not only chose to continue their investment but also recommended the Trading Bot to an additional 77 new clients.

Table 6: Annual summary of client accounts, starting AUM, final AUM, % of winning clients, % of losing clients, Total Fees paid and Net PnL.

Year	Clients	Start AUM	End AUM	Winners	Losers	Total Fees Paid by Clients	Total Net PnL for Clients
2013	100	$1,000,000	$944,051	77%	23%	$47,348	-$55,949
2014	154	$1,540,000	$1,448,827	77%	23%	$73,182	-$91,173
2015	236	$2,360,000	$2,222,201	77%	23%	$113,052	-$137,799
2016	364	$3,640,000	$3,413,169	76%	24%	$170,201	-$226,831
2017	554	$5,540,000	$5,175,271	75%	25%	$259,441	-$364,729
2018	836	$8,360,000	$7,966,662	78%	22%	$402,934	-$393,338
2019	1,302	$13,020,000	$12,368,067	78%	22%	$625,335	-$651,933
2020	2,026	$20,260,000	$19,439,611	79%	21%	$979,590	-$820,389
2021	3,184	$31,840,000	$30,115,664	77%	23%	$1,523,386	-$1,724,336
2022	4,912	$49,120,000	$46,060,595	76%	24%	$2,322,311	-$3,059,405
Total	13,668					$6,516,780	-$7,525,883

The second year started with 154 clients, 54% more than the first year. Similar results are obtained at the of the year, with 77% (118) accounts reaching the 20% target, while 23% (36)(accounts experiencing losses. The fees collected by the Bot provider increased to $73,182 while the overall dollar PnL across account sum to a disappointing -$91'173.

Due to random chance, each year the percentage of winners oscillate between 75% and 78% allowing the number of clients to grow constantly year after year. After 10 years, 13,668 clients have invested in the Trading Bot. The total fees collected by the Trading Bot Provider sum up to an outstanding $6,516,780 despite an overall loss of more than $7,500,000 collected by clients.

As long as the losers do not start discouraging other investors from using the Trading Bot service, the number of clients will continue to grow. This growth would be fueled by the spontaneous promotion from about 75% of the investors who annually earn a 20% return, without knowing that sooner or later a sequence of daily losses would blow-up their account.

6 Conclusion

This research has unveiled the deceptive potential of the Martingale betting system when exploited by scammers in the financial sector. We have demonstrated how scammers can use this methodology to dupe investors, creating the facade of a highly lucrative trading strategy. Our empirical analysis has shown the alarming ease with which even a random signal based Bot can appear convincingly profitable, thus misleading less experienced retail investors into significant economic risks.

Through statistical analysis and simulations, particularly involving the Nasdaq 100 index (QQQ ETF), our research clearly illustrates the deceptive efficacy of these strategies. They project an illusion of profitability and safety, while in reality, they harbor hidden dangers and potential for significant capital losses. The Martingale system, promising to offset losses with a single win, lures investors into a false sense of security, drastically increasing their exposure to extreme risks.

More crucially, our findings illuminate the broader implications of such deceptive practices in finance. The efficacy of financial scams is based not only on deceptive quantitative models but also on exploiting psychological vulnerabilities and gaps in regulatory oversight. As financial scams become more sophisticated, the urgency for investor education and regulatory vigilance intensifies.

Our paper contributes significantly to the existing literature by dissecting the mechanics behind financial scams and offering insights into their detection and prevention. It stands as a warning to investors, regulators, and the general public, underlining the necessity for enhanced awareness and discernment in the intricate and often perilous financial market landscape.

This research is not merely an academic endeavor but a practical guide aimed at preserving the integrity of financial markets and protecting investors from the harmful impacts of financial scams. It underscores the importance of ongoing financial education and the development of stronger regulatory frameworks to mitigate the risks posed by such

fraudulent tactics.

In conclusion, while strategies that use the Martingale system may present a façade of easy profits in the short term, they are intrinsically flawed and perilous in the long term. It is crucial for all participants in the financial ecosystem to remain vigilant and proactive in identifying and countering such deceptive schemes to ensure the stability and integrity of financial markets.

Author Biography

Andrew Aziz

Andrew Aziz is a Canadian trader, investor, and official Forbes Council member. He has ranked as one of the top 100 best-selling authors in "Business and Finance" for 7 consecutive years from 2016 to 2023. Aziz's book on finance has been published in 13 different languages. Originally from Iran, Andrew moved to Canada in 2008 to pursue a PhD in chemical engineering, initiating a distinguished career in academia and industry. As a research scientist, Andrew made significant contributions to the field, authoring 13 papers and securing 3 US patents. Following a successful stint in research in chemical engineering and clean technology, he transitioned to the world of trading. Currently Andrew is a trader and proprietary fund manager at Peak Capital Trading in Vancouver, BC Canada.

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Carlo Zarattini, originally from Italy, currently resides in Lugano, Switzerland. After completing his mathematics degree in Padova, he pursued a dual master's in quantitative finance at Imperial College London and USI Lugano. He formerly served as a quantitative analyst at BlackRock, where he developed volatility and trend-following trading strategies. Carlo later established Concretum Research, assisting institutional clients with both high and medium-frequency quantitative strategies in stocks, futures, and options. Additionally, he founded R-Candles.com, the first backtester for discretionary technical traders.

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