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Overconfidence in Passive Investing: The Role of Personality and Personal Experience

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Abstract

Passive investing has surpassed active investing, representing over 50% of global assets under management (AUM) for the first time since its inception five decades ago. From behavioral finance perspective, moving from active to passive is a shift beyond arithmetic and logic. Both styles require behavioral alignment on individual investors, failing which there will be no basis of confidence to hold such investment over time. A comparative study was made between active and passive investors in the context of overconfidence bias, i.e., the most popular behavioral bias studied among retail investors. Given the enduring nature of human overconfidence, the study explored whether passive investors exhibit similar level of bias as their active counterparts. Additionally, a nature-and-nurture model incorporating investor's personality and personal experience were included as antecedents to enrich understanding on its effect toward overconfidence. For the purpose of this study, a questionnaire survey was conducted among Malaysian investors surrounding the Covid-19 pandemic in early 2020. Data on three hundred and fifty retail investors were garnered with self-report on personality, personal experience, overconfidence and investing style. On the instruments, we employed Gray's neuropsychological perspective of personality in the expression of behavioral inhibition and activation systems (BIS/BAS). Overconfidence was analyzed in three forms, i.e., better-than-average (BTA), illusion-of-control (IOC), and volatility estimate (VOLEST). The result showed that overconfidence bias is observed among active and passive investors. Additionally, investors with higher BIS inversely predict IOC which in turn lead to adoption of passive investing. Winning experiences positively affect IOC which in turn lead to active investing. The last section discussed the implication of overconfidence in passive investing and the role of personality and personal experience in eliciting client's risk profile.

Keywords: Passive Investing, Behavioral Bias, Investing Style, Retail Investor, Personal Experience

Introduction

In the field of behavioral finance, the passive investing strategy that now attracts trillions of dollars annually had a humble beginning. Prior to 1976, the only way to gain market exposure was through active strategies, primarily via individual stocks and mutual funds. Then came John Bogle, founder of Vanguard. He posited that owning a widely diversified basket of stocks, essentially owning the entire market over time, might be a

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better strategy than attempting to outperform by selecting individual companies (Bogle, 2002). The Vanguard 500 Index Fund launched in 1976 faced initial undersubscription as the financial community held faith in their active strategies for market timing and outperformance. However, with the benefit of hindsight and five decades of financial data comparing active and passive strategies, the latter has demonstrably produced higher returns with lower risk.

The increasing dominance of passive investing, given its immense size in monetary terms and its potential effect on global asset pricing, deserves closer attention. As more money exits active funds and flows into passive instruments, there is a concerning lack of effort to understand the behavioral motivations behind this style shift. While alpha chasing, the pursuit of above-average market returns, may offer a preliminary explanation for investor behavior (Smith & Smith, 2024), this study delves deeper by examining the potential role of *behavioral alignment* in the rise of passive investing. This concept refers to the degree of congruence between an investment strategy and the inherent characteristics of investors, such as personality and personal experience.

The rise of the digital economy has accelerated the adoption of online investing, fueling innovation in both active and passive strategies. Recent developments in active management include ESG investing, factor investing, and algorithm-driven investing (Fama & French, 2015; Faridi, Madanchi, Daneshvar, Shahverdiani, & Rahnamay, 2023; Meira, de Souza Cunha, Orsato, Miralles-Quirós, & Miralles-Quirós, 2023). At its core, active investing posits that investors can outperform the market by identifying specific metrics or advantages that significantly predict stock prices. Passive investing, on the other hand, focuses on innovation within multi-strategy ETFs, such as target-date funds and robo-advisory services.

Although this paper differentiates between active and passive investing styles, real-world application often exhibits a degree of convergence. For example, an investor might actively select a specific sector (active approach) and then passively purchase leading companies within that sector. Despite this potential overlap, researchers posit that analyzing investment styles through a binary lens remains valuable for two key reasons. First, global assets under management (AUM) clearly distinguish between the two strategies, informing both the fund industry and fund management research. Second, an investor's overall approach is ultimately determined by the dominant perspective underlying their chosen strategies.

This study focuses on overconfidence, the most well-studied bias in financial decision-making, and its potential impact on both active and passive investing styles. Despite limited existing research, researchers posit that overconfidence could permeate both approaches. To address this gap, researchers specifically explore overconfidence bias within the context of passive investing. Are there distinct psychological profiles between passive and active investors? If such differences are identified, how can the fund industry adapt its strategy to better support both client groups in making investment decisions?

Understanding the impact of overconfidence on investment style choices is crucial, as it leads to suboptimal financial decisions (Bhandari & Deaves, 2006). For active investors, overconfidence can manifest in detrimental ways, namely overbetting leading to capitulation (selling at a loss due to panic), excessive trading that incurs high transaction costs, and clinging to losing stocks, potentially leading to catastrophic consequences.

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However, less research has explored the impact of overconfidence on passive investors. A hypothetical scenario where the global market experiences a prolonged downturn could test the patience of passive investors, as index funds are designed to track market performance. This study investigates whether overconfident passive investors are prone to making suboptimal decisions similar to their active counterparts.

This study is among the first to empirically investigate overconfidence in passive investing. To enrich understanding, it also examine the antecedents of overconfidence. Prioritizing recent literature and the principle of parsimony, the focus is placed on personality and personal experiences, which reflecting the nature-and-nurture dimension influencing individual investors. For comparative purposes, both active and passive investing styles are examined as outcome variables.

The study filled the gap of knowledge by studying overconfidence surrounding the passive investing momentum. Researchers adapted a behavioral model of investing choice, incorporating two key perspectives: (1) BIS/BAS perspective of personality following the narrowed focus in recent investing literature (Oehler, Wendt, Wedlich, & Horn, 2018) and (2) personal experience which had garnered attention in both academic and industry circles (Malmendier & Nagel, 2011; Klement, 2015; Andersen, Hanspal, & Nielsen, 2019; Walters & Fernbach, 2021). The study seeks to address three research questions. First, how does overconfidence profile differ between active and passive investors? Second, how does personality affect overconfidence? Third, what role does personal experience play in shaping overconfidence? The rest of the paper is structured as follows: literature review, hypothesis development, methodology, result and discussion, and lastly implication and recommendation.

Literature Review and Hypothesis Development

This study conceptualizes personality and personal experience as the nature-and-nurture antecedents of overconfidence. It posits that overconfidence, in turn, predicts the adoption of either an active or passive investment style. The analysis prioritizes examining the relationship between overconfidence and investing style, with a particular focus on passive investing. Subsequently, the independent effects of personality and personal experience on overconfidence are explored. Finally, the research culminates in the development of a comprehensive conceptual model integrating four variables: personality, personal experience, overconfidence, and investing style.

Overconfidence and Investing Style

Overconfidence, a well-documented cognitive bias in financial decision-making, is characterized by an overestimation of one's ability to outperform the market (Foo, Wahidudin, & Chie, 2020; Menkhoff, Schmeling, & Schmidt, 2013). This bias can lead to suboptimal investment choices, potentially sabotaging overall portfolio returns.

Khan et al. (2019) conducted a Malaysian study investigating the relationship between perceived past returns, overconfidence, and investment behavior. Surveying 454 individual and 66 institutional investors, the study employed a three-pronged approach to measure overconfidence: miscalibration, better-than-average effect, and illusion of control. Interestingly, their findings revealed that individuals with inflated perceptions of past returns exhibited increased trading frequency and opted for riskier asset allocation. Additionally, the study identified the better-than-average effect as a mediating factor in the relationship between perceived returns and investment behavior for individual investors. This suggests a tendency for individuals with overestimated

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abilities to make riskier choices following past success. Notably, the study did not observe this effect among institutional investors, potentially due to their heightened awareness of behavioral biases (Khan et al., 2019).

The findings of Khan, Tan, and Chong (2019) resonate with a meta-analysis conducted by Grežo (2021) on overconfidence and financial decision-making. This analysis revealed a statistically significant, yet relatively weak, overall effect of overconfidence on investment behavior. Notably, the study identified the indirect effect of overconfidence, mediated by other variables. This suggests that overconfidence may exert its influence through intervening factors, such as financial literacy or risk perception.

Further bolstering this notion, Ahmad and Shah's (2020) study with 183 retail investors in Pakistan provides empirical support. Their findings demonstrate that overconfidence does indeed impact both investment decisions and performance. They posit that factors like financial literacy and risk perception may play a mediating role in this relationship.

Active and passive investment styles employ distinct methodologies to capture market returns. Investor selection of a style is likely influenced by a combination of financial literacy and inherent risk tolerance (Shefrin & Statman, 2000). Fung and Durand (2015) emphasize the concept of "behavioral alignment," where investor temperament aligns with chosen investment actions. Active investing, for example, necessitates frequent monitoring of stock prices, market analysis to identify opportunities, and a personality suited to tolerating market volatility that directly impacts returns. Active investors ideally possess high reward sensitivity, seeking alpha (outperformance) while acknowledging the associated risk. Additionally, emotional stability, characterized by low sensitivity to negative stimuli, is crucial for managing portfolio volatility.

For the purpose of this study, we posit that investors with higher overconfidence levels are motivated toward active investing, while investors with lower overconfidence levels prefer passive investing. In addressing the first research question, H1 is phrased as follows:

H1: Overconfidence affects investing style.

Personality and Overconfidence

Eysenck's (1990) Trait Theory posits that personality is comprised of enduring characteristics that exert a significant influence on individual behavior. This study leverages this theory to explore the role of personality traits as a source of investor behavior, potentially explaining the variations observed in decision-making across different investor profiles.

Durand, Newby, Tant, and Trepongkaruna (2013) investigated the relationship between personality traits and overconfidence in a sample of 115 students from G-8 Australian universities. Utilizing the NEO-PIR personality instrument within an experimental setting, their findings revealed a significant negative association between extraversion and overreaction. Participants scoring higher on extraversion exhibited wider bid-ask spreads, a metric commonly used to proxy overconfidence. Furthermore, the study found that higher extraversion correlated with holding smaller, riskier market capitalization stocks.

In contrast, neuroticism (negative emotion) displayed a positive correlation with trading frequency. This suggests that neurotic investors might engage in more frequent

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trading, potentially as a coping mechanism to lessen negative emotions. However, Peterson (2010) offers a contrasting perspective, suggesting that negative stimuli might hinder risk-taking behavior, leading individuals to become more risk-averse or exhibit decision inhibition.

Oehler et al. (2018) highlight extraversion and neuroticism (E&N) as the most prominent personality factors influencing overconfidence. These dimensions align with alternative personality models, such as Eysenck's Three-Factor Model and Gray's biopsychological perspective on behavioral motivation, which incorporates the Behavioral Inhibition System (BIS) and Behavioral Activation System (BAS). The BIS/BAS framework, focusing on sensitivity to stimuli and threshold activation, offers a valuable perspective for understanding how investors, shaped by their inherent personality traits, react differentially to positive and negative stimuli in the investment context.

Passive investors adopt a buy-and-hold approach, gaining broad market exposure through index funds. This diversified strategy eliminates the need for security selection and aims to capture market returns net of fees. Passive investors typically exhibit longer investment horizons. From a volatility perspective, index funds generally experience smaller price fluctuations compared to individual stocks, a characteristic inherent to active investing. The BIS/BAS framework suggests that investors drawn to passive strategies might be characterized by higher sensitivity to negative stimuli (elevated BIS) and potentially lower reward sensitivity (lower BAS).

Johnsi and Sunitha (2019) examined the influence of personality and emotional intelligence on investment behavior among Indian investors. Utilizing a stratified sampling technique, they targeted 120 investors actively trading on either the Bombay Stock Exchange (BSE) or National Stock Exchange (NSE) to complete personality and investment behavior questionnaires. Their findings revealed a significant positive association between extraversion and overconfidence. This aligns with the research conducted by Kumar et al. (2021) and Ahmad (2020), where both studies identified a significant positive relationship between extraversion and overconfidence bias.

Visser, Bender, Bowden, Black, Greenwell-Barnden, Loft, and Lipp (2019) investigated the manifestation of overconfidence in a complex task environment. The study employed an air traffic control simulation experiment involving 187 Australian undergraduate participants. The findings revealed a positive association between impulsivity, a personality trait demonstrably linked to the Behavioral Activation System (BAS), and overconfidence.

Drawing upon the discussion, we posit that the Behavioral Activation System (BAS), characterized by its reward-seeking propensity, influences investor overconfidence. Consequently, elevated overconfidence is hypothesized to motivate investors towards active investment styles. Conversely, the Behavioral Inhibition System (BIS), associated with inhibition and avoidance behavior, is expected to dampen investor overconfidence, potentially leading them to gravitate away from active investing and towards more passive strategies. To address the second research question, H2 and H3 are developed as follows:

H2: High BAS increases overconfidence which in turn lead to adoption of active investing style.
H3: High BIS decreases overconfidence which in turn lead to adoption of passive investing style.

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Personal Experience and Overconfidence

This study explores the potential influence of experiential biases on financial decision-making. One prominent theory in this domain is the peak-end rule, a cognitive heuristic introduced by Kahneman et al. (1993). This rule posits that individuals primarily remember experiences based on the peak (most intense moment) and the end. Supporting evidence is drawn from experiments involving unpleasant experiences, such as cold-hand immersion and colonoscopies. In these studies, participants exhibited a preference for experiences with a more positive ending, even when the overall duration or intensity of the negative aspects were greater. These findings suggest that a similar phenomenon might be applicable to financial experiences. Investors might be drawn to riskier investments due to the allure of high potential gains (peak), while also placing undue emphasis on their most recent portfolio value (end). This selective memory bias could potentially lead to suboptimal financial decision-making.

Regret avoidance, another prominent behavioral bias, significantly influences investor behavior. This concept, as explored by Bailey and Kinerson (2005), suggests that investors are motivated to avoid situations that might trigger regret arising from past losses. Regret can manifest in two forms: experienced regret (based on past choices) and anticipatory regret (fear of future regret). Notably, regret exerts a powerful influence on decision-making across various contexts. Hung, Ku, Liang, and Lee (2007) examined the potential of integrating regret avoidance into decision support systems, while Boeri et al. (2012) proposed a regret minimization model to guide heart disease patients in lifestyle choices. Within the financial domain, Frydman and Camerer (2016) investigated how neural activity reflects feelings of regret during stock trading, particularly in situations where participants witness a chosen stock rise in value after opting not to buy it. Further advancements in this area involve incorporating regret theory into investment portfolio algorithms, as demonstrated by Hazan and Kale (2015).

Prospect theory, a foundational concept in behavioral finance introduced by Tversky and Kahneman (1979), proposes that losses are perceived more intensely than gains of equivalent magnitude. This asymmetry in how investors value gains and losses translates directly to financial decision-making. For instance, the emotional burden of losing RM10,000 might not be fully offset by a subsequent gain of RM10,000. This phenomenon can hold true even when the gain is a multiple of the loss, such as twice or even three times the amount. This prospect theory framework highlights the potential for emotional biases to significantly impact investor behavior.

Investor risk tolerance is a subjective construct, with perceived risk acting as a more robust predictor of behavior compared to purely objective measures like standard deviation (Nosić & Weber, 2010). This perception is demonstrably influenced by personal experiences. Research suggests that negative experiences, such as witnessing or enduring a financial crisis, can lead to a subsequent decrease in risk-taking behavior (Malmendier & Nagel, 2011). This observed shift in behavior can potentially be attributed to a decline in overconfidence as a consequence of such negative experiences.

However, the influence of experience can be multifaceted. Investors experiencing early success, particularly during the initial stages of their investment journey, may exhibit a heightened sense of optimism, potentially leading them to engage in riskier investment behaviors (Chiang, Hirshleifer, Qian, & Sherman, 2011; Khan et al., 2019). This aligns with research findings that associate frequent past success, whether actual or perceived, with increased trading activity and a preference for holding riskier assets (Khan et al., 2019). This phenomenon underscores the potential for a feedback loop, where past performance exerts a significant influence on future

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investment decisions and potentially fosters overconfidence (Chiang et al., 2011). In essence, positive experiences can serve as a catalyst for overconfidence, further amplifying risk-taking tendencies.

The interplay between experience and overconfidence appears multifaceted. While some studies suggest a dampening effect of experience on overconfidence (Malmendier & Nagel, 2011), others report a positive association between age and overconfidence, even amongst seasoned investors (Menkhoff et al., 2013). This apparent contradiction underscores the need for further research to elucidate the nuanced influence of experience on overconfidence. Future investigations should explore how the nature of experience, particularly experiences involving financial losses, interacts with individual characteristics to shape overconfidence levels. This call for extended research is further amplified by the acknowledged dearth of literature in this domain, as highlighted by Nosić and Weber (2010) and Malmendier and Nagel (2011).

Based on the review of literature, we propose that personal experience affects investors' level of overconfidence, which in turn affect their decision to invest either actively or passively. In answering the third research question, H4 is articulated as follows:

H4: Personal experience affects overconfidence which in turn affects investing style.

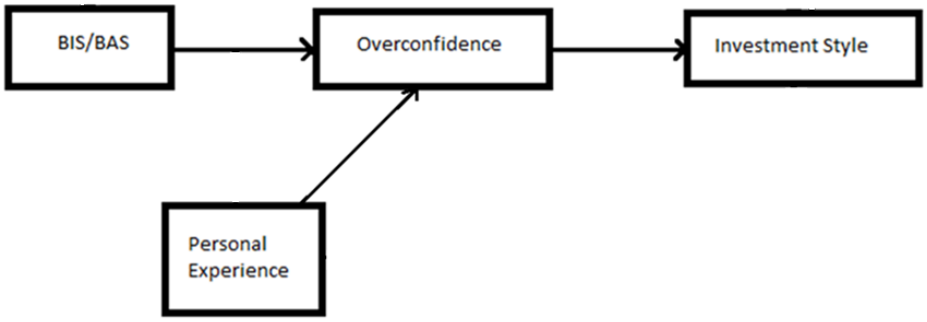

Figure 1: Conceptual Framework
Source: Authors

Conceptual Framework

Figure 1 presents the conceptual framework. The nature-and-nurture predictors were represented by BIS/BAS personality and personal experience. They serve as antecedents to overconfidence, which in turn predicts investors' preference to either invest actively or passively. Hypotheses on overconfidence were phrased as a single variable for clarity, although the statistical test will involve three distinctive forms, i.e., BTA, IOC, and VOLEST. Each form examines the overplacement, overestimation, and overprecision tendency of respondents. Also, as overconfidence is the focal point of research in behavioral finance, the direct effect that bypasses overconfidence is excluded from the study.

Methodology

An online questionnaire survey, administered via Google Forms, was distributed to investment affinity groups within prominent social networking platforms in January, July, and August of 2020. The survey instrument consisted of 32 questions organized

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into five distinct sections. These sections addressed respondents' demographics, investment style, personal investment experiences, personality traits, and overconfidence bias. To ensure informed participation, a comprehensive introductory section preceded the questionnaire. This section detailed the research objectives, estimated completion time (10-15 minutes), ethical approval information, and data privacy assurances. Additionally, it provided a link to contact the authors for inquiries and feedback.

Samples were identified locally in Malaysia to minimize potential geographical and cultural influences. From the equity market standpoint, the relative market size of Malaysia is 1.69% of the Asia emerging market according to the iShares CSEMAS Index ETF. Top four geographic regions, namely China, Taiwan, South Korea, and India, cumulatively made up over 86% of the Asia emerging market.

Survey instruments (refer to Table 1) consisted of the Behavioral Inhibition System/Behavioral Activation System (BIS/BAS) scale by Carver and White (1994) and three forms of overconfidence measures operationalized as better-than-average (BTA), illusion-of-control (IOC), and volatility estimate (VOLEST). All variables, except for VOLEST were assessed using Likert-type questions, while the latter is measured by the upper and lower bound of KLCI (Kuala Lumpur Composite Index) for the next one month, with a 90% confidence interval. The study employed categorical variables for (1) personal experience ranging from little/none, some, to significant experience and, (2) investing style in the form of active, semi-active, and passive. Active is defined using individual stockpickings, semi-active on purchase and redemption of actively managed mutual funds, and passive on index funds or ETFs. This classification reflects the degree in which the investors relegate their control on their investment performance from the selection of individual stocks to selection of fund managers to finally selection of geographical region for broad-based index investing.

Table 1: Survey Instruments

Variable	Instrument	Data Type	Questionnaire Item
BIS/BAS	Adopted from Carver & White (1994)	Interval	11-22
	BIS – 7 items		
	BAS-R* – 5 items		
Overconfidence	Adapted from Khan et al. (2019), Lambert et al. (2012)	Interval	
	Better-than-average – 4 items		23-26
	Illusion of control – 3 items		27-29
	Volatility estimate – 1 item		30-31
Investing style	-	Nominal	5-6
Personal Experience	-	Nominal	7-10

*Factor analysis of BAS revealed three sub facets, but only one facet is narrowed in investing research in line with past literature. BAS-R denotes the reward-responsiveness facet of the construct.

Tables 2 and 3 below present the reliability and validity components (via factor analysis) of the survey instruments. Cronbach's Alpha (Nunnally & Bernstein, 1994) of 0.7 and above was achieved for all instruments except for the Illusion-of-Control (IOC) scale, which yielded a value of 0.698. Factor analysis for the Behavioral Inhibition System (BIS) scale indicated a need for item reduction to produce satisfactory factor loadings at 0.5 and above. The removed items, BIS1 ("Even if something bad is about to happen to me, I rarely experience fear or nervousness") and BIS6 ("I have very few fears compared to my friends"), captured fear associated with uncertainty (relevant in

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financial studies) and peer comparison (a general concept), respectively. Both removed items were reverse-coded as originally intended by the author.

Table 2: Reliability Test

Variable	Cronbach's Alpha	Number of items
Personality		
BIS	0.708 (0.754)	7(5)
BAS	0.732	5
Overconfidence		
Better-than-average	0.852	4
Illusion of control	0.698	3

Table 3: BIS/BAS Factor Matrix

	Factor	
	1	2
BIS2	.586	
BIS3	.672	
BIS4	.530	
BIS5	.598	
BIS7	.573	
BAS1		.526
BAS2		.715
BAS3		.550
BAS4		.556
BAS5		.530

Maximum Likelihood Extraction and Varimax rotation with Kaiser Normalization. Item removals applied when loadings are below .5

Investors with prior investment experience were recruited to participate in the study. As a token of appreciation, participants received Grab vouchers upon completion. The study adhered to ethical guidelines regarding participant compensation. Duplicated and incomplete entries were filtered prior to analyzing descriptive statistics. The study resulted in a final sample of 350 investors, with their characteristics summarized in the following four tables (Table 3a to 3d): (1) socio-demographic, (2) investment experience, (3) personality, and lastly (4) overconfidence.

Table 3a: Socio-Demographic Profile

		Investing Style			
	Frequency	Active	Semi-active	Passive	No Equity
	350	131	86	106	27
Gender					
Male	284	106	73	88	17
Female	66	25	13	18	10
Age					
20-29	190	61	45	65	19
30-39	118	45	33	33	7
40-49	22	9	5	7	1
50 and above	20	16	3	1	0
Income Level					
RM100,000 and below	238	85	60	73	20

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RM100,001 to RM300,000	79	35	19	23	2
RM300,001 to RM600,000	2	0	0	2	0
RM600,001 and above	5	3	0	2	0
Not disclosed	26	8	7	6	5
Net Worth					
RM1,000,000 and below	299	112	73	93	21
RM1,000,001 to RM3,000,000	13	8	1	3	1
RM3,000,001 and above	14	5	3	5	1
Not disclosed	24	6	9	5	4

Source: Authors

The sample characteristics skewed towards males (81%), with a concentration in the 20-39 age group (88%). A majority reported an annual income of less than RM100,000 (68%) and a net worth below RM1,000,000 (85%). The sample is grouped into three categories with no equity as the reference group. In terms of investment profile, 54% of the respondents exhibited a long-term investment approach, characterized by a time horizon of 10 years or more. About 71% of respondents have accumulated investing experience of less than 5 years. Regarding market exposure, 59% had experienced a bull market, while 45% had been exposed to a bear market. Additionally, 11% had significant financial gain experience, while 13% had significant financial loss experience. From the perspective of the peak-end rule, which suggests that individuals tend to weight peak and end experiences more heavily when evaluating events, the sample appeared to consist primarily of investors with some, but not extensive, exposure to market volatility.

Table 3b: Investment Experience

	Frequency	Active	Semi-active	Passive	No Equity
	350	131	86	106	27
Investing Horizon					
Less than 2 years	34	14	3	8	9
2 to 5 years	61	28	15	14	4
5 to 10 years	63	18	19	24	2
10 to 20 years	70	29	20	16	5
More than 20 years	119	41	29	44	5
Currently not investing	3	1	0		2
Investing Experience					
Less than 2 years	160	50	41	55	14
2 to 5 years	89	36	23	30	0
5 to 10 years	49	20	13	15	1
10 to 20 years	22	13	7	2	0
20 years and above	12	12	0	0	0
Little/none	18	0	2	4	12
Exposure to Bull Market					
Yes	208	83	48	72	5
No	142	48	38	34	22
Exposure to Bear Market					
Yes	157	83	48	57	5

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No	193	48	38	49	22
Personal Experience in Financial Gain					
Little/Some	276	102	71	89	14
Significant	39	20	10	9	0
No	35	9	5	8	13
Personal Experience in Financial Loss					
Little/Some	233	86	64	73	10
Significant	45	27	7	10	1
No	72	18	15	23	16

On personality, scores on both the Behavioral Inhibition System (BIS) and Behavioral Activation System (BAS) scales were recorded at above-average levels. When examining investing styles, similar levels of BIS were found across all groups. However, BAS levels were highest among passive investors, followed by semi-active and then active investors. This finding is counterintuitive, as active investing is traditionally associated with individuals who are highly sensitive to rewards, such as achieving superior investment performance. Passive investing, on the other hand, prioritizes stability and diversification over maximizing returns.

Table 3c: Personality

		Investing Style			
		Active	Semi-active	Passive	No Equity
Frequency		131	86	106	27
BIS	Mean	2.87	2.88	2.84	3.10
	SD	0.552	0.589	0.600	0.585
BAS	Mean	3.30	3.37	3.42	3.30
	SD	0.469	0.460	0.464	0.662

Both Better-Than-Average (BTA) and Illusion-of-Control (IOC) measures revealed above-average levels of overconfidence among respondents. When examining investing styles, active investors exhibited the highest levels of overconfidence, followed by semi-active and then passive investors. For the volatility estimate, the sample exhibited a degree of calibration, with estimates closer to the actual KLCI volatility. These estimates ranged from 7.06% for active investors to 9.58% for passive investors. The historical volatility, calculated using the standard deviation of daily returns at the time of the survey, was 6.45%. The historical volatility data was obtained from closing prices of the KLCI captured on BarChart.com. The descriptive statistics revealed that active investors provided volatility estimates closest to the historical value, while the overall sample reported a wider volatility forecast of 8.58%, potentially indicating a tendency towards underestimation of future market volatility.

Overall, active investors exhibited overconfidence as evidenced by higher scores on both Better-Than-Average (BTA) and Illusion-of-Control (IOC) measures. Additionally, the narrow range of volatility estimates provided by active investors suggests a potential bias towards overprecision (i.e., an overestimation of the accuracy of their volatility estimates). This can likely be attributed to their greater knowledge and

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familiarity with equity market movements. In contrast, both semi-active and passive investors provided a much wider range of estimates, which may indicate underconfidence.

Table 3d: Overconfidence

	Mean SD	Active	Semi-active	Passive	Historical Volatility
Volatility Estimate	8.58%*	7.06%	9.56%	9.58%	6.45%
Better-than-average	2.77 0.87	2.94 0.821	2.72 0.898	2.71 0.785	
Illusion-of-control	2.82 0.75	3 0.746	2.79 0.781	2.68 0.637	

*Aggregate mean consisting of survey between Jan, July, and August 2020 batch is reported

Findings

Multinomial logistic regression analysis was conducted to investigate whether overconfidence predicts investment style. This method allows modeling of categorical outcomes with three or more classes using independent variables (Hosmer & Lemeshow, 2013). Preparatory tests to assess model fit were conducted. The chi-square test indicated an acceptable model fit ($\chi^2(528)=534.397$, df = 528, p=.414). Next, model fitting information revealed that the addition of overconfidence statistically and significantly improved the model compared to the intercept-only model (p=0.01). The pseudo R-square (Nagelkerke, 1991) value of 8.3% suggests a weak to moderate effect size for the overconfidence scales in predicting investment style. Model coefficients in Table 4 showed that both Illusion-of-Control (IOC) and Volatility Estimate (VOLEST) were found to significantly predict investing style (p=0.023; p=0.007). Specifically, both overconfidence scores were significantly different between active and passive investors. Based on these findings, the null hypothesis for H1 is rejected.

Table 4: Multinomial Logistic Regression

								95% Confidence Interval for Exp(B)	
		B	Std. Error	Wald	df	Sig.	Exp(B)	Lower Bound	Upper Bound
Active	Intercept	-1.603	.585	7.514	1	.006			
	BTA	.042	.228	.034	1	.853	1.043	.667	1.630
	IOC	.600	.264	5.161	1	.023*	1.823	1.086	3.060
	VOLEST	.596	.220	7.341	1	.007*	1.815	1.179	2.793
Semi-active	Intercept	-.662	.603	1.205	1	.272			
	BTA	-.195	.252	.602	1	.438	.823	.502	1.348
	IOC	.349	.290	1.453	1	.228	1.418	.804	2.501
	VOLEST	.201	.237	.720	1	.396	1.223	.769	1.945

*p<0.05
Reference category: Passive investors

To examine the potential mediating role of overconfidence between personality and investment style, a mediation analysis was conducted. To simplify the analysis

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process, only significant relationships identified between the predictor and mediator variables, and between the mediator and outcome variable, were considered. The analysis identified a significant indirect effect of personality on investment style mediated by Illusion-of-Control (IOC). However, Sobel and bootstrapping procedures revealed no significant mediating effect of the Behavioral Activation System (BAS) dimension on the relationship between personality and investment style. Therefore, further path analysis for Hypothesis 2 (H2) concerning BAS was discontinued. The path analysis details for the BIS dimension of personality are presented in Tables 5 and 6.

Table 5: Path Analysis (BIS → IOC→ IS)

Hypothesis	First Path	Second Path
Path	BIS → IOC	IOC → IS
r	-0.183	-0.263
p-value	0.01	0.01
r squared	3.3%	6.9%
Constant	3.510	1.699
b	-0.183	-0.673

Active investor as the first group, and passive investor as the reference group

To assess the influence of BIS on IOC scores, a linear regression analysis was employed. The model exhibited a good fit ($F(1,235)=8.128$, $p=0.01$) and explained 3.3% of the variance in IOC scores. The results indicated a significant negative association between BIS scores and IOC scores, suggesting that higher BIS (greater punishment sensitivity) is linked to lower illusion of control. Subsequently, a multinomial logistic regression analysis was conducted to examine the effect of IOC on the likelihood of adopting passive investing compared to active investing. This model was statistically significant ($\chi2(1)=12.536$, $p=0.01$) and demonstrated a pseudo R-square (Nagelkerke, 1991) of 6.9% for explaining the variance in passive investing. Additionally, the model correctly classified 58.6% of the investor classifications. The results indicated that increasing illusion of control (IOC) was associated with a reduction in the likelihood of adopting active investing.

Preacher and Hayes (2004) macro with bootstrapping was employed in SPSS to assess the significance of the indirect effect within a simple mediation model. This approach aligns with the recommendations of Memon et al. (2018) concerning best practices for mediation analysis. Following these recommendations, the significance of the indirect effect was determined by two criteria: (1) a Sobel test p-value less than 0.05, and (2) a 95% confidence interval for the indirect effect that does not include zero. The results in Table 6 indicated a statistically significant indirect effect based on both the Sobel test ($p=0.0274$) and the bootstrapping procedure.

Table 6: Simple Mediation Analysis (H3)

	Lower 95% CI	Upper 95% CI	Mean	Sig
Sobel	0.0042	0.0717		0.0274
Bootstrap	0.0078	0.078	0.0381	

Bootstrapping resample is 1000 using Preacher and Hayes (2004) SPSS macro.

Sample Size: 237

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IV: BIS; MV: IOC; DV: IS

The analysis revealed a significant negative association between BIS and Illusion-of-Control (IOC). This finding suggests that higher BIS (greater punishment sensitivity) is linked to lower illusion of control. Furthermore, lower IOC scores were associated with a higher likelihood of adopting a passive investment style. In conclusion, these findings imply that investors with higher BIS scores tend to exhibit lower illusion of control, which in turn is associated with a preference for passive investing. Conversely, investors with lower BIS scores may exhibit higher illusion of control, potentially leading them towards active investing. The result fail to reject the null hypothesis of H2 for the Behavioral Activation System (BAS) dimension. The results support H3 for the BIS dimension.

To examine the potential influence of personal experience, the path analysis (presented in Table 7) was repeated, replacing BIS as the antecedent variable with four separate measures of personal experience: bull/bear market exposure and winning/losing experiences. Among these four variations, only winning experience produced a positive and statistically significant association with Illusion-of-Control (IOC).

Table 7: Path Analysis (PE → IOC→ IS)

Hypothesis	First Path	Second Path
Path	PE* → IOC	IOC → IS
r	0.219	-0.263
p-value	0.01	.01
r squared	4.8%	6.9%
Constant	2.448	1.699
b	0.372	-0.673

*Personal experience in winning money
**Indirect effect of PE toward IS is 0.092

The results of both Sobel test and bootstrapping procedures indicated that illusion-of-control (IOC) significantly mediated the relationship between winning experience and investment style (p=0.0149). This suggests that when investors experience winning episodes, their illusion of control increases, which in turn leads them towards adopting an active investment style. The null hypothesis for H4 is therefore rejected based on the findings concerning winning experience.

Table 8: Simple Mediation Analysis (H4)

	Lower 95% CI	Upper 95% CI	Mean	Sig
Sobel	-0.1054	-0.0114		0.0149
Bootstrap	-0.1089	-0.0156	-0.0585	

Bootstrapping resample is 1000 using Preacher and Hayes (2004) SPSS macro

Sample Size: 237

IV: PE; MV: IOC; DV: IS

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Discussion

Discussion 1: Evidence of Overconfidence among Passive Investors

Although active investors exhibited higher overconfidence levels compared to their passive counterparts, the above-average scores observed among passive investors warrant further investigation. For instance, the lack of significant difference in Better-Than-Average (BTA) scores between the groups suggests a general tendency among investors to perceive themselves as above average, regardless of their chosen investment style. Since overconfidence is a well-documented phenomenon, a shift in investment style may not necessarily lead to a corresponding adjustment in overconfidence levels. This study contributes to the understanding of overconfidence by incorporating the behavioral perspective outlined by Redhead (2010). The study highlights the potential role of investor temperament, which goes beyond purely cognitive processes, in explaining overconfidence beyond just changes in investment style.

With the global rise of passive investing and its significant share of fund management, understanding the psychological profile behind this investment style becomes crucial. Does the increasing popularity of passive investing signify a global decline in investor confidence? Overconfidence is known to lead to various suboptimal investment behaviors, including overexposure to a specific asset class (overbetting), selling assets at a loss due to panic (capitulation), clinging to losing investments to avoid admitting mistakes (holding on to losers), and excessive focus on a limited number of investment ideas (underdiversification). While historical data suggests a generally positive upward trend for passive funds since the inception of index funds, little is known about how passive investors will behave during a prolonged and sustained market downturn.

Discussion 2: BIS inversely predicts IOC, and lower IOC predicts passive investing style

This study provides partial evidence for the association between personality traits and overconfidence, as measured by BIS and its influence on the Better-Than-Average (BTA) score. The findings revealed a significant positive association between BIS and BTA scores, suggesting that higher BIS (greater punishment sensitivity) is linked to higher BTA scores (inflated self-perception). However, BTA scores did not significantly influence investment style selection. Furthermore, among the three overconfidence measures (IOC, VOLEST), both Illusion-of-Control (IOC) and VOLEST scores exhibited significant relationships with investment style. To further investigate these relationships, a path analysis was conducted incorporating BIS, IOC, and active/passive investment style as variables.

This study did not identify a direct relationship between personality traits and investment style. However, an indirect effect mediated by Illusion-of-Control (IOC) was observed. These findings align with prior research by Durand, Newby, Tant, and Trepongkaruna (2013) and Oehler, Wendt, Wedlich, and Horn (2018), which suggests a link between personality traits and overconfidence. This study contributes to the understanding of how investor personality and overconfidence influence the choice between active and passive investing. Specifically, negative emotions associated with investing, such as worry and regret triggered by market volatility, can influence investors' perceptions of their ability to control market outcomes. Lower Illusion-of-Control (IOC) scores reflect underconfidence, which in turn, is associated with a preference for passive investing.

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An alternative perspective suggests that investors with lower BIS scores might exhibit emotional stability when encountering negative emotions associated with investing. This emotional stability could potentially lead to an increased perception of control over investment outcomes. These investors, with their perceived control and potentially higher risk tolerance, may then be more inclined to engage in active investment strategies, believing they can exploit market inefficiencies.

Discussion 3: Winning experience positively affects IOC, and higher IOC predicts active investing style

Investor's experience in winning is found to positively affect IOC which in turn leads to active investing. This finding aligns with the established concept that both positive and negative experiences can influence an investor's overall perception of the investment landscape. Prior research by Malmendier and Nagel (2011) and Andersen et al. (2019) demonstrates that past financial shocks can have long-lasting effects on future financial risk-taking behavior. This study did not find evidence to support a link between negative experiences (losing money) and overconfidence. These findings suggest that overconfidence may exhibit a persistent, trait-like quality, potentially remaining relatively stable even in the face of negative financial experiences.

Interestingly, this study found that winning experiences increased overconfidence. This finding presents a challenge in fully understanding the influence of prior experience on overconfidence levels. Prospect theory posits that the negative emotions associated with financial losses are psychologically twice as powerful as the positive emotions associated with equivalent financial gains. Based on prospect theory, one would logically expect that negative experiences (losses) would have a more significant impact on an investor's financial outlook. This study found no evidence that negative experiences (losses) reduce overconfidence. Conversely, winning experiences were associated with increased overconfidence. In conclusion, this study highlights the importance of considering both personal experience and overconfidence in understanding investor behavior and investment style selection.

The path analysis results suggest a significant indirect effect of personal experience (winning) on investment style mediated by illusion-of-control (IOC). The model can be depicted as follows:

Winning Experience → Increased Illusion-of-Control (IOC) → Active Investing
Less Winning Experience → Decreased Illusion-of-Control (IOC) → Passive Investing

Investors who experience more wins tend to develop a stronger illusion-of-control, leading them to believe they can outperform the market and favoring active investment strategies. Conversely, those with less winning experience may exhibit lower illusion-of-control, making them more receptive to passive investing approaches.

This study found that retail investors with more frequent winning experiences exhibited higher levels of illusion-of-control (IOC), which in turn, was associated with a preference for active investment strategies. Furthermore, the analysis suggests that a reduction in winning experiences (from frequent wins to some wins to no wins) leads to a decrease in IOC, ultimately influencing a shift towards passive investing strategies. Winning experiences may serve to confirm pre-existing beliefs about an investor's ability to time the market, leading to a heightened perception of control over future price movements. The absence or reduction in winning experiences may create cognitive

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dissonance, a state of mental discomfort that arises from holding conflicting beliefs. When these beliefs about successful market timing are not reinforced by repeated wins, they become less accessible, potentially leading to a decline in investor confidence. This decline in confidence can then manifest in financial behavior, such as a shift towards less risky investment alternatives like broad diversification through passive investment strategies.

Implication

The findings of this study have significant implications for the fund industry, particularly for the passive investment sector. Traditionally, investor selection for passive funds has relied less on personality and personal experience, with hypothetical scenarios often used to assess risk tolerance during market downturns. This over-reliance on hypothetical scenarios creates a risk of financial advisors misgauging clients' risk tolerance. Should the current trend towards passive investing reverse, this mismatch could have a detrimental effect on clients' ability to remain invested during market volatility.

An ideal investment approach should be carefully tailored to consider both the investor's unique characteristics (personality and personal experiences) and their behavioral makeup (cognitive and emotional factors that influence confidence). Social science acknowledges the difficulty in precisely measuring human behavior and memory (Ranganath, 2024). However, accurately assessing these complex psychological factors can be challenging. Financial advisors, while valuable resources, may not possess the specialized training of psychologists to comprehensively address investor behavior.

Passive investing requires a hands-off, buy-and-hold the market approach for a considerable long investing horizon, mostly measured in decades. A critical question remains: can passive investors maintain their holdings during extended market downturns? This concern is particularly relevant when considering a potential 'passive fund exodus,' a scenario where a loss of investor confidence due to persistent negative market signals and conflicting information triggers a mass withdrawal from passive investment vehicles.

This study reinforces the significance of incorporating the experiential dimension of investors into the development of more robust research models on investment behavior. Given the variability in the nature and magnitude of past major financial events, continuous examination and comparison of these studies are crucial to establishing a comprehensive understanding of investor behavior through the lens of experience.

We examined the influence of overconfidence bias (the tendency to overestimate one's knowledge or abilities) on investor behavior, with a particular focus on its impact on the preference for passive investment strategies. The study demonstrates the utility of incorporating personality and personal experience into client risk assessments by developing a *nature-and-nurture* model that predicts investor overconfidence, which in turn influences the adoption of active or passive investment styles. In conclusion, the global trend towards passive investing among both retail and institutional investors can be understood not only as a shift in investment philosophy but also as a reflection of underlying behavioral dynamics.

The research contributes to the field of behavioral finance by proposing a model that integrates personality, personal experience, overconfidence, and investment style.

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This aligns with Richard Thaler's encouragement for research that builds behaviorally realistic models one behavior at a time. Three research questions were answered by four hypotheses, pointing toward evidence on (1) the prevalence of overconfidence bias among passive investors, (2) the influence of personality on the dimension of negative emotion or Behavioral Investment Sensitivity (BIS) toward overconfidence, and (3) how past winning exposure elevates investors' overconfidence. BIS-sensitive investors with a lack of prior winning experience have a lesser tendency to exhibit overconfidence, which in turn predicts adoption of passive investing.

Limitation and Recommendation

This study acknowledges three key limitations. The first limitation is that the reliance on quantitative data impeded the exploration of psychological factors in risk taking. Further research that combines quantitative and qualitative methods, such as interviews and focus groups, is recommended. Second, the impact of the pandemic on the data is recognized, prompting the replication of future studies preferably during a period of market stability. Researchers can also consider pre-post designs to track changes in investor behavior. Third, the study calls for a more nuanced conceptualization of investing style that incorporates the standard industry practice of combining equity and fixed income allocations based on risk tolerance. These refinements would improve the generalizability and depth of future research on investing behavior.

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