CONFUSING BRAINS WITH RETURNS: EVIDENCE OF INVESTOR OVERCONFIDENCE AND TRADING ACTIVITY IN THE INDONESIAN STOCK MARKET

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ABSTRACT

This study investigates the presence of investor overconfidence in the Indonesian equity market by analyzing the lead-lag relationship between stock returns and subsequent trading activity. Focusing on the constituents of the LQ45 index from January 2023 to December 2025, we employ a firm-level panel data approach with fixed effects and clustered robust standard errors on a monthly dataset (N=1,485$). Using share turnover as a proxy for trading intensity, the analysis tests the hypothesis that past positive returns lead to increased trading volume due to biased self-attribution.

The empirical results demonstrate that both contemporaneous and lagged individual stock returns exert a positive and statistically significant influence on trading activity ($p < 0.05$), confirming that Indonesian investors tend to trade more aggressively following periods of capital gains. This behavioral pattern remains robust across alternative turnover specifications, including total-share and free-float-based proxies, as well as log-transformed models. Furthermore, lagged market returns exhibit a dominant positive effect, suggesting that market-wide sentiment acts as a powerful catalyst for trading frequency. These findings provide strong evidence of overconfidence-driven behavior in the Jakarta Composite Index, highlighting how psychological biases—rather than purely fundamental information—drive market liquidity and volatility in an emerging market context.

Keywords: Investor Overconfidence, Trading Volume, Stock Return

1. Introduction

Efficient Market Hypothesis (EMH) posits that investors are rational actors who process all available information instantly to determine asset prices. However, the persistent occurrence of market anomalies and speculative bubbles suggests that financial markets are not purely rational. Shiller (2003) argues that price fluctuations are frequently driven by psychological factors rather than fundamental shifts, thus contradicting efficient market theory and supporting behavioral finance. The result suggests that market participants are not rational, but rather psychologically affected investors who are inherently susceptible to cognitive errors and emotional biases (Statman, 1999). Consequently, investor sentiment becomes a crucial driver of market outcomes, as it significantly influences trading decisions and asset valuations beyond what is justified by economic fundamentals (Baker and Wurgler, 2007).

Among the various cognitive distortions identified in behavioral literature, overconfidence stands out as one of the most common biases affecting financial decision-making. Theoretically, overconfident investors tend to overestimate the precision of their private information and their skills, which inevitably leads to excessive trading levels compared to purely rational benchmarks (Odean, 1998). This psychological tendency causes measurable

increase in transaction frequency, where investors mistakenly attribute successful outcomes to their own superior abilities rather than market luck (Barber and Odean, 2001). Crucially, this overconfidence is frequently reinforced by a "self-attribution bias" triggered by recent capital gains; as investors experience positive returns, their confidence in their predictive capabilities grows disproportionately, subsequently driving higher trading turnover in subsequent periods (Statman, Thorley, and Vorkink, 2006).

The Indonesian capital market provides a compelling environment to examine these behavioral theories due to its increase of the number of investors and its characteristics over the last few years. According to official data from the Kustodian Sentral Efek Indonesia (KSEI, 2025), the number of capital market investors (SIDs) has surged exponentially, reaching a significant milestone of 20.32 million by December 2025, a remarkable 37% increase from the previous year. This rapid expansion is predominantly driven by a younger demographic, with over 54% of investors aged under 30 and nearly 80% under the age of 40 (KSEI, 2025). Such a dominant presence of retail and millennial-Gen Z investors, who often possess limited financial literacy and a higher propensity for speculative trading, suggests that the Jakarta Stock Exchange (JKSE) may be susceptible to psychological biases. In this retail-heavy ecosystem, where trading decisions are frequently influenced by social media sentiment and short-term price momentum rather than fundamental analysis, the impact of overconfidence on market liquidity and turnover becomes a critical area of investigation.

Studies linking stock returns to overconfidence at the firm level in Indonesia market is limited. Additionally, the unique ownership structure in Indonesia—where free-float shares can be relatively low relatives to total shares outstanding—suggests that measuring trading activity using total shares might not fully reflect actual investor trading. Therefore, this study aims to fill this gap by examining Indonesian market and comparing different turnover measures to provide a clearer picture of overconfidence in the Indonesian market.

To address the aforementioned gaps, this study provides a comprehensive firm-level examination of the Indonesian stock market, focusing specifically on the constituents of the LQ45 index from January 2023 to December 2025. By utilizing a fixed-effects panel data approach, we investigate the causal link between past stock returns and subsequent trading activity across four distinct model specifications. A key contribution of this research is the testing of robustness through the comparison of total-share turnover and free-float-adjusted turnover, alongside both natural log-transformed and level-based functional forms. Our empirical results provide compelling evidence of the overconfidence effect: both contemporaneous and lagged individual stock returns significantly and positively influence trading intensity. Furthermore, the strong positive impact of lagged market returns suggests that broad market sentiment also serves as a catalyst for investor activity. By confirming that past gains drive excessive trading across various specifications, this study underscores the critical role of psychological biases in shaping investor overconfidence in Indonesia market.

2. Literature Review

In behavioral finance, overconfidence is recognized as a complex cognitive bias that fundamentally distorts an individual's assessment of their own knowledge and the precision of the information they possess. This phenomenon is primarily rooted in two psychological pillars: miscalibration and the better-than-average effect. Daniel, Hirshleifer, and Subrahmanyam (1998) define overconfidence primarily through the lens of miscalibration, where investors tend to overestimate the precision of their private information signals, leading them to believe their insights are far more accurate than market realities suggest. This internal bias is further exacerbated by the tendency of individuals to rate their own abilities, such as

stock-picking skills, as superior to the average investors (Glaser and Weber, 2007). This overestimation manifests as excessively narrow confidence intervals; investors who suffer from miscalibration often provide point estimates for future asset returns with a degree of certainty that is statistically unwarranted (Bhandari and Deaves, 2006). Collectively, these psychological tendencies create tendency for suboptimal financial decision-making.

The theoretical foundation for using the lead-lag relationship between stock returns and trading volume as a proxy for overconfidence is rooted in the self-attribution bias. According to the framework established by Statman, Thorley, and Vorkink (2006), capital gains serve as a psychological reinforcement; as investors experience positive returns, they disproportionately attribute success to their own analytical skill rather than market luck. This heightened confidence leads to a measurable increase in trading intensity in subsequent periods as investors overestimate the precision of their information. Therefore, a statistically significant positive coefficient for lagged returns (SR_{t-1}) serves as an empirical 'fingerprint' of overconfidence-driven turnover

The empirical link between overconfidence and trading activity has been extensively documented in developed financial markets, where institutional participation is high and market efficiency is relatively mature. Chuang and Lee (2006) provide a comprehensive evaluation of the U.S. market, demonstrating that investors trade more aggressively following positive market returns, a behavior consistent with the overconfidence hypothesis. Their findings confirm that capital gains serve as a psychological catalyst, reinforcing investors' belief in their convictions and subsequently increasing transaction volumes. This phenomenon is not localized; rather, it appears to be a global characteristic of financial behavior. Griffin, Nardari, and Stulz (2007), in a massive cross-country study involving 46 markets, found that the positive relationship between past returns and trading turnover is a near-universal occurrence.

In emerging market contexts, the dynamics of overconfidence become even more significant. In markets like China, Chen, Kim, Nofsinger, and Rui (2007) highlight that retail investors—who often dominate the trading landscape—are particularly susceptible to overconfidence-driven behaviors. Unlike the more seasoned institutional players in developed markets, emerging market participants frequently lack extensive experience and are more prone to attributing market-wide bull runs to their own personal trading skill. This retail dominance creates a unique environment where behavioral biases, such as overconfidence and the disposition effect, become primary drivers of market activity. Consequently, while the overconfidence effect is universal, its impact in an emerging market like Indonesia is interesting to be researched.

3 Research Method

3.1 Data and Sample Selection

This study employs firm-level panel data from companies listed on the Indonesian Stock Exchange (IDX). The sample consists of 44 firms observed at a monthly frequency over the period january 2023 – December 2025. The dataset includes stock prices, trading volume, total shares outstanding, free-float shares, and market index (IHSG) values. The data were downloaded from Revinitif.

Due to differences in listing dates, some firms do not have complete observations for the entire sample period. Therefore, the dataset is treated as an unbalanced panel.

3.2 Variable Definitions

Dependent Variables: Trading Activity

Trading activity is measured using share turnover, defined as the ratio of trading volume to shares outstanding. To ensure robustness, four alternative measures of turnover are employed:

- **$TA_{(i,t)}$** : Trading volume divided by total shares outstanding
- **$TAFF_{(i,t)}$** : Trading volume divided by free-float shares percentage
- **$LNTA_{(i,t)}$** : Natural logarithm of TA_{i,t}
- **$LNTAFF_{(i,t)}$** : Natural logarithm of TAFF_{i,t}

The logarithmic transformation is applied to reduce skewness and mitigate the influence of extreme values commonly observed in trading volume data.

Independent Variables

Stock return and market return are used as key explanatory variables:

- **$SR_{(i,t)}$** : Stock return of firm *i* at time *t*
- **$SR_{(i,t-1)}$** : Lagged stock return
- **$MR_{(t)}$** : Market return at time *t*, proxied by the return of the Jakarta Composite Index (JKSE)
- **$MR_{(t-1)}$** : Lagged market return

Lagged stock return is used to capture investor overconfidence, as prior gains may lead investors to overestimate their ability and increase trading activity. Lagged market return is included to account for market-wide sentiment effects.

3.3 Empirical Model Specification

To examine the relationship between returns and trading activity, the following panel regression model is estimated:

$$Turnover_{i,t} = \beta 1\ SR_{i,t} + \beta 2\ SR_{i,t-1} + \beta 3\ MR_t + \beta 4\ MR_{t-1} + \alpha_i + \gamma_t + \epsilon_{i,t}$$

where:

i denotes firm

t denotes time

α_i represents firm-specific fixed effects

γ_t represents time fixed effects

$\epsilon_{i,t}$ is the error term

The dependent variable $Turnover_{i,t}$ is alternatively specified as TA, TAFF, LNTA, and LNTAFF to assess robustness.

The empirical specification is designed to capture the dynamic relationship between returns and trading activity while addressing potential econometric concerns. A fixed-effects panel regression is employed to control for unobserved, time-invariant firm-specific characteristics—such as investor composition, ownership structure, and trading culture—that may simultaneously influence returns and trading activity. This choice is theoretically motivated, as these latent factors are likely correlated with the explanatory variables, rendering pooled OLS or random-effects estimators potentially biased. In addition, standard errors are clustered at the firm level to account for heteroskedasticity and serial correlation within entities. To further mitigate the influence of extreme values commonly observed in emerging markets, all variables are winsorized at conventional thresholds. These procedures ensure that the estimated relationships are robust and consistent with the underlying assumptions of panel data estimation.

3.4 Estimation Method

The model is estimated using a fixed effects (FE) panel regression approach. The fixed effects specification is chosen to control for unobserved, time-invariant firm characteristics that may influence trading behavior, such as firm size, industry classification, or ownership structure.

Time fixed effects are also included to capture common shocks affecting all firms, such as macroeconomic conditions or market-wide events.

To address potential heteroskedasticity and serial correlation within firms, standard errors are clustered at the firm level.

3.5 Model Variations and Robustness Checks

To ensure the robustness of the results, the analysis is conducted using four alternative specifications of the dependent variable:

1. LNTA_(i,t): natural log of monthly trading volume in shares divided by total share outstanding

2. LNTAFF_(i,t): natural log of monthly trading volume in shares divided by free floating shares

3. TA_(i,t): monthly trading volume in shares divided by total share outstanding

4. TAFF_(i,t): monthly trading volume in shares divided by free floating shares

These variations allow for the assessment of whether the results are sensitive to the choice of turnover proxy (total shares versus free-float shares) and functional form (level versus logarithmic transformation).

3.6 Data Treatment and Variable Construction

All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. Lagged variables are constructed by shifting the respective series by one period.

The panel structure is defined using firm identifiers and time indices, allowing for the application of panel data techniques. Missing observations are retained where possible, resulting in an unbalanced panel.

4 Results and Discussion

Results of the 4 regressions are shown in table 1.

				SR (t)		SR (t-1)		MR (t)		MR (T-1)	
	Dependent Variable	R square within	F sig	Coef	Sig	Coef	Sig	Coef	Sig	Coef	Sig
Regression 1	LNTA	18.1%	0.00%	0.67	0.00	0.34	0.03	-2.82	0.21	11.96	0.00
Regression 2	LNTAFF	18.2%	0.00%	0.68	0.00	0.33	0.04	-2.68	0.23	11.42	0.00
Regression 3	TA	13.4%	0.00%	0.03	0.00	0.01	0.06	-0.13	0.13	0.42	0.00
Regression 4	TAFF	13.7%	0.00%	0.09	0.00	0.04	0.06	-0.56	0.05	1.07	0.01

Table 1: regression results.

Table 1 presents the results of the panel regressions examining the relationship between stock returns, market returns, and trading activity. Overall, all models are statistically significant at the 1% level, as indicated by the F-statistics. The within R-squared values range from 13.4% to 18.2%, with the log-transformed models (LNTA and LNTAFF) exhibiting higher explanatory power compared to the level specifications (TA and TAFF). This suggests that the logarithmic transformation improves the model fit by reducing skewness in trading activity.

4.1 Stock Returns and Trading Activity

The results show a strong and consistent positive relationship between contemporaneous stock returns (SR_t) and trading activity across all model specifications. The coefficients for SR_t are positive and highly significant at the 1% level in all regressions. In the log-transformed models, the coefficients are relatively large (0.67 and 0.68), indicating that higher stock returns are associated with a substantial increase in trading activity. Although the magnitude is smaller in the level models, the positive and significant relationship remains robust. This finding suggests that investors tend to trade more actively in the period of positive price movements, which is consistent with increased attention or momentum-driven trading behavior.

More importantly, lagged stock returns (SR_{t-1}) exhibit a positive effect on trading activity in all models. The coefficients are statistically significant at the 5% level in the log specifications and marginally significant (10% level) in the level specifications. This pattern provides empirical support for the overconfidence hypothesis. Specifically, investors appear to increase their trading activity following past gains, potentially attributing prior success to their own skill and becoming more confident in subsequent decisions.

4.2 Market Returns and Trading Activity

The effect of contemporaneous market returns (MR_t) on trading activity is generally weak and statistically insignificant across most specifications. An exception is observed in the TAFF model, where MR_t shows a negative and statistically significant effect at the 5% level. However, given the inconsistency across models, this result should be interpreted with caution.

In contrast, lagged market returns (MR_{t-1}) demonstrate a strong and positive relationship with trading activity in all specifications. The coefficients are statistically

significant at conventional levels, indicating that market-wide gains in the previous period leads to increased trading activity in the current period.

This finding suggests the presence of a market-wide sentiment effect, where investors respond not only to their own stock performance but also to broader market conditions. Positive market performance may reinforce investor optimism and stimulate trading activity across the board.

4.3 Robustness Across Model Specifications

To ensure the robustness of the findings, the analysis employs four alternative measures of trading activity: total-share turnover (TA), free-float turnover (TAFF), and their logarithmic transformations (LNTA and LNTAFF). The results are remarkably consistent across these specifications.

First, the signs of the key coefficients remain stable across all models. Both contemporaneous and lagged stock returns exhibit positive effects on trading activity, while lagged market returns consistently show a strong positive influence. Second, the statistical significance of the main variables is largely preserved, particularly in the log-transformed models, which display stronger significance and higher explanatory power.

The similarity between the results using total shares and free-float shares suggests that differences in share structure across firms do not materially affect the estimated relationships. This outcome is consistent with the use of firm fixed effects, which absorb time-invariant firm characteristics, including differences in ownership structure or free-float proportions.

Overall, these findings indicate that the observed behavioral patterns are robust to alternative model specifications and measurement approaches.

5 Conclusion

The empirical results provide strong evidence supporting the presence of investor overconfidence in the Indonesian stock market. The positive and significant relationship between past stock returns and current trading activity suggests that investors tend to increase trading following prior gains. This behavior is consistent with biased self-attribution, where investors interpret past success as a result of their own ability rather than external factors.

In addition to individual-level overconfidence, the findings also highlight the role of market-wide sentiment. The consistent positive effect of lagged market returns indicates that broader market conditions influence investor behavior, potentially amplifying trading activity during periods of overall market optimism.

Taken together, the results suggest that trading activity in the Indonesian stock market is influenced by both individual cognitive biases and collective sentiment dynamics. This has important implications for market efficiency, as excessive trading driven by behavioral factors may lead to mispricing and increased volatility.

Furthermore, the stronger results observed in the log-transformed models imply that accounting for the skewed distribution of trading activity enhances the detection of behavioral effects. This underscores the importance of appropriate variable transformation in empirical finance research.

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