From Copy to Practice: Follower's Learning Behavior in Forex Social Trading

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Short Paper

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Abstract

Forex social trading platforms endows novice investors with opportunities to trade on foreign exchange markets by mimicking the investment strategies of sophisticated traders. But concurrently, the copy-trading mechanism underlying these platforms foster a conducive learning environment whereby inexperience followers could evolve into independent traders by observing and learning from the trading behaviors of prominent traders. Drawing on observational learning theory, we advance learning efficiency and effectiveness as focal yardsticks to encapsulate followers' learning performance and explore their effects on the profitability of followers' first independent trades. Preliminary analysis conducted on a leading forex social trading platform reveals that traders' trading consistency amplifies followers' learning efficiency whereas traders' profitability bolsters followers' learning effectiveness. Furthermore, while our empirical findings attest to the criticality of learning effectiveness on followers' ability to profit from their initial independent trades, speeding up the learning process may not guarantee better performance.

Keywords: Forex Social Trading, Observational Learning, Copy Trading, Manual Trading

Introduction

Social trading has emerged as a novel digital trading platform that allows unsophisticated investors to trade in diverse financial assets in the likes of commodities, currencies, and stocks (Kromidha and Li 2019; Pelster and Hofmann 2018). Amongst social trading platforms, forex social trading is the most dominant (Menkhoff et al. 2016). Users on forex social trading platforms can be delineated into two types: traders and followers (Glaser and Risius 2018). Traders, who possess superior professional knowledge and trading experience, will disclose their trading strategies and real-time trading behaviors. In turn, the transparency and visibility of traders' performances would enable investors, who lack the necessary expertise to profit from forex markets, to become followers and participate in forex trading by copying trades from traders (Glaser and Risius 2018).

Although past studies have elevated our awareness of social trading, contemporary knowledge on this nascent financing market has not gone beyond the behavioral patterns of followers' following and trading behavior from the perspectives of disposition effects and herd behaviors (Glaser and Risius 2018; Kromidha and Li 2019; Pelster and Hofmann 2018). Such an emphasis omits the distinctive characteristic of social trading whereby copy trading not only permits followers to profit by mimicking trades from experienced traders, but it also serves as a pedagogical tool for followers to observe, corroborate, and learn the trading strategies of traders (Berger et al. 2018). Once followers have internalized the trading strategies picked up from traders, they evolve into independent traders by engaging in manual trading. Conceiving copying trading as a learning process for followers to acquire the requisite skills toward becoming independent traders and manual trading as the coveted learning outcome, we draw on *Observational Learning Theory* (OLT) to uncover the factors affecting followers' manual trading behavior on forex social trading platform. This endeavor aims to extend extant literature on social trading by incorporating observational learning as an underlying mechanism for interpreting the trading behaviors of inexperienced investors.

Observational learning refers to individuals' behavioral changes and knowledge gains through observing and learning from others (Plavnick and Hume 2014; Van et al. 2009; Wulf and Lewthwaite 2010). This conforms to the setup of forex social trading in that repeated observations and corroborations of traders' trading strategies acts as an impetus for followers' learning (Mattar and Gribble 2005; Roediger et al. 2006). Through learning from experienced traders, followers, who begin as novice investors, could build up confidence in their ability to profit from independent practice (Liu and Chu 2010; Mengelkamp and Bannert 2010). We hence construe followers' first trial on manual trading as an initial test of their learning performance (Butler 2010).

According to Maslovat et al. (2010), observational learning embodies a process of information transfer between instructors and learners. Extant literature on observational learning has accentuated *learning efficiency* and *learning effectiveness* as two separate yardsticks for evaluating such information transmission (Honebein and Honebein 2015; Shea et al. 1999). Particularly, *learning efficiency* is concerned with the amount of resources (e.g., cost and time) expended for learning (Shea et al. 1999), whereas *learning effectiveness* stems from the achievement of desired learning objectives (Honebein and Honebein 2015; Sher 2009). As the predominant adviser in social trading platforms, 'instructor' or 'followed' traders' (henceforth referred to as 'trader' for simplicity) trading behaviors and performances would affect their follower's learning process and in turn, shape the latter's learning outcomes. Taking into account the tight linkage between task complexity and individual's learning efficiency (Wulf and Shea 2002), we posit that followers' learning efficiency is dictated by the extent to which traders adhere to consistent trading strategies: the more consistent a trading strategy, the easier it would be to emulate. Likewise, as a volitional process, followers' learning effectiveness is dependent on their willingness to learn from a given trader (Sher 2009). We hence postulate traders' profitability during the period of observational learning as a key antecedent influencing followers' learning effectiveness.

Synthesizing extant literature on forex trading and observational learning, we advance a research model that attempts to unravel followers' learning process and outcome on forex social trading platforms. Specifically, we endeavor to: (1) *deconstruct followers' learning process on social trading platforms by explicating how traders' trading consistency and performance could affect their followers' learning efficiency and effectiveness respectively, as well as; (2) evaluate the impact of followers' learning efficiency and effectiveness on their ability to profit from their first manual trade(s).*

Theory Development and Hypotheses Formulation

Forex Social Trading and First Manual Trading

As a form of financial innovation, social trading platforms allow users to invest in commodities, currencies, indices, stocks, and other financial assets (Pelster and Hofmann 2018). Forex social trading centers on currency trading in forex markets. Because forex markets are renowned for their complex portfolio (Menkhoff et al. 2016), massive scale (Dorfleitner et al. 2018), and limited information sharing (Leblang 2010), inexperienced investors venturing into such markets are often compelled to learn from others. In this sense, forex social trading can be conceived as a solution to the preceding by granting a high degree of transparency and visibility to leading traders' trading strategies and real-time trading behaviors. In turn, inexperienced investors can not only follow leading traders and indulge in copy trading, they can also learn

from the latter's trading strategies and become independent traders over time (Dorfleitner et al. 2018). Past studies on social trading has sought to shed light on this emerging financial innovation (Berger et al. 2018; Oehler et al. 2016) by illuminating the effects of traders' trading performance on followers' copy trading behavior (Dorfleitner et al. 2018). For example, Pelster and Hofmann's (2018) work not only examined how the financial advice followers gained from mimicking traders' portfolios could induce the disposition effect, but it also illustrated how such risk-averse behavior would sustain even when the follower becomes a leading trader. Likewise, Kromidha and Li (2019) investigated how determinants of traders' leadership aptitudes, including risk signals, traders' credentials, trading volume and performance, could entice more followers. Yet, despite the myriad of evidence attesting to the drivers of copy trading and following behaviors, there is a dearth of research that views social trading platforms as a learning environment for followers to cultivate and hone their trading skills through observing and copying experienced traders.

On social forex trading platforms, traders have their own trading strategies and analytical styles, signals which can be effortlessly captured by inexperienced investors by following and copying the trading behaviors of experienced traders (Gallo and Fratello 2014). Trader's trading behaviors hence constitute an invaluable learning resource for followers. Beyond copying other traders' trades, forex social trading platforms also permits followers to carry out manual trading. Followers typically treat manual trading as an opportunity to enhance their trading skills and gain experience in forex trading. Conceivably, manual trading is indicative of followers' propensity to put into practice what they have learnt from experienced traders (c.f., Berger et al. 2018; Glaser and Risius 2018). In other words, when followers have garnered enough confidence from emulating other traders, they are likely to take the next step toward practice by conducting their first manual trade(s). Naturally, depending on whether these first manual trade(s) marks a follower's conversion into an independent trader or serves as a prelude to the next round of observational learning, they could consist of a single trade or a series of consecutive manual trades.

Observational Learning Theory: An Overview

As a pedagogical technique for acquiring knowledge and skills that are hard to convey through instruction (Goubert et al. 2011; Plavnick and Hume 2014; Van et al. 2009; Wulf and Lewthwaite 2010), *observational learning* manifests in the form of changes in behavioral patterns through observing and imitating others. In observational learning, the learner obtains information about a given situation and its outcomes by observing how the instructor behaves in the situation (Goubert et al. 2011). After a period of learning coupled with renewed confidence in their own competency, learners will put what they have learnt into practice and regard the ensuing behavioral performance as feedback to finetune the learning process (Vollmeyer and Rheinberg 2005). In this sense, observation and practice adheres to an iterative cycle within observational learning so much so that the *initial* practice plays an instrumental role in shaping the entire learning process. Indeed, as alleged by Roediger et al. (2006), learning outcomes are better for individuals who receive feedback from hands-on practice than for those without. In the same vein, we argue that in the context of forex social trading, the process by which followers copy others' trades before subsequently executing their own manual trades is definitive of observational learning and that the first manual trade(s), as a proxy for initial practice, reflects followers' level of their confidence in their observational learning. Furthermore, we distinguished between learning *efficiency* and *effectiveness* as indicators of learners' learning performance (Honebein and Honebein 2015; Shea et al. 1999). Whereas learning efficiency denotes the amount of resources (e.g., time and money) devoted to facilitate learning (Shea et al. 1999). Learning efficiency is attained when followers can maximize their learning while minimizing their resource expenditure (Shea et al. 1999). Conversely, learning effectiveness is a measure of achievement (Honebein and Honebein 2015) and is often associated with knowledge transfer or learning retention (Shea et al. 1999).

Follower's Learning Efficiency and Traders' Trading Consistency

Learning efficiency governs the utility to be gained from learning (Shea et al. 1999). Depending on the pedagogical content and context, learning efficiency is typically reflected through expenditures of money, time, or other resources (Honebein and Honebein 2015; Wulf and Shea 2002). Conceivably, the trades initiated by traders constitute learning resources for their followers in forex social trading. This is because every visible trade for a select trader contains a myriad of pertinent trading metrics, such as trade lots, open/close date and price, and open positions, that could be consolidated to form a distinctive trading strategy. By observing and copying others' trading strategy, followers can minimize the amount of resources

they have to expend in acquiring forex trading skills, thereby bolstering learning efficiency (Rawson and Dunlosky 2012). But at the same time, prior research has shown that the complexity of learning tasks will impact learners' learning efficiency (Wulf and Shea 2002). Learning task complexity refers to the number of informational elements that must be processed concurrently during learning (Kirschner et al. 2009). As the complexity of a learning task increases, learners will be required to concurrently process a greater number of information elements, which in turn decreases learning efficiency (Kirschner et al. 2009). While some traders have a stable trading strategy, others will adjust or alter the strategies (Neely and Weller 2013). For a follower who is learning from others' trading behaviors, behavioral fluctuations in the latter will inevitably contribute to the complexity of the learning task. Consequently, consistency in traders' trading behavior is indicative of the complexity of followers' learning task and their subsequent learning efficiency (Thomas and Bain 1982). Consistency in traders' trading behaviors will reduce the complexity of followers' learning tasks and promote learning efficiency and vice versa. We therefore hypothesize that:

Hypothesis 1: Traders' trading consistency positively influences their follower's learning efficiency.

Follower's Learning Effectiveness and Traders' Trading Profitability

Learning effectiveness has been touted as another determinant of emulators' learning performance in observational learning (Honebein and Honebein 2015; Shea et al. 1999). Specifically, observational learning process is usually initiated via emulating the instructor's behaviors and the effectiveness of such imitation is largely mirrored by the resemblance between the learner's own practice and the imitated behavior (Braaksma et al. 2002). Likewise, followers who hope to hone their trading skills by imitating experienced traders could culminate in similar trading behaviors. Prior research on social trading has conceptualized the similarity between follower's and trader's trade configurations as the incarnation of the former's emulative behavior and testified to the effectiveness of imitation in bolstering followers' trading performance (Berger et al. 2018). As an autodidactic process, the effectiveness of observation learning is largely dependent on a learner's own volition and depends, to a large extent, on whether the instructor's behavior is worthy of emulation (Sher 2009). This is in line with Kromidha and Li (2019), who affirmed the definitive role of traders' trading performance in driving followers' copy trading decisions. In this sense, traders' profitability would amplify their followers' willingness to not only learn the trader's trading behavior, but to also emulate it in their own practice. We therefore hypothesize that:

Hypothesis 2: Traders' trading profitability positively influences their follower's learning effectiveness.

Follower's Learning Behaviors and Follower's Performance on the First Manual Trades

Learners' performance on their own practice has been alluded to be a key litmus test of their learning outcome (Butler 2010). Particularly, self-learner's first attempt toward independent execution, such as followers' first manual trade(s) on social trading platforms, not only captures their learning gains, but also reflects their confidence with respect to the observation learning process that precedes it (Liu and Chu 2010; Mengelkamp and Bannert 2010). First, followers' verdict on their learning efficiency implies their beliefs on the innate capability and such beliefs are likely to increase their confidence in achieving profitable manual trading (Liu and Chu 2010). Self-confidence has been widely contended to be an impetus for attaining desired performance on practical tests (Feltz 2007). Second, effective emulation has been advocated as a core driver that converts inexperienced followers to profitable leading traders (Pelster and Hofmann 2018). This may be due to the fact that learners could improve through emulating their instructors during the process of observational learning (Van Gog et al. 2009). Emulation has also been articulated as a valuable learning strategy that significantly improves follower's trading performance (Berger et al. 2018). Taken together, we postulate that followers' learning efficiency and effectiveness jointly determine the eventual outcome of individual practice by boosting their confidence and competency in executing profitable trades. We therefore hypothesize that:

Hypothesis 3: Follower's learning efficiency positively influences the profitability of his/her first manual trades.

Hypothesis 4: Follower's learning effectiveness positively influences the profitability of his/her first manual trades.

Preliminary Data Analysis

Measure Development and Data Collection

To validate our research model, we extracted data from a leading forex social trading platform which has more than $800 billion trading volume in total. This platform has been around for more than a decade and houses more than 4,500 traders for users to follow. Our dataset contains 114 followers' trading history with 1,888 records of manual trading and 13,096 records of copy trading from October 2010 to April 2019. We also identified 309 traders who were followed by these 114 followers. Measurement was developed based on indicators commonly used in forex trading. Specifically, *traders' trading consistency* was measured by the standard deviation of four forex trading indicators: *lots, open positions, position duration,* and *drawdown* (Lee and Ma 2015)[1]. A low level of standard deviation reflects a high level of trading consistency. Amongst the four forex trading indicators, *lots* measure the trader's lot size setting in one trade; *open positions* represent the number of open position held by a trader simultaneously in a day; *position duration* is the time length of one trade from open date to closed date; *drawdown* is the magnitude of a decline in account value measured from peak to trough during the trading period. As a follower could follow one or multiple traders, the traders' trading consistency is the average value of the consistency of all traders followed by this follower. Due to different scales of four indicators, we normalized the indicators values by Min-Max normalization transformation method before calculating the standard deviation (Jain and Bhandare 2011). The traders' trading consistency measured by an indicator is shown in Equation 1 below:

$$\text{Traders' trading consistency}_X = \sum_{i=1}^{n} Std_{iX}/n \quad (1)$$

where X represents one forex trading indicator; i represents the trader; Std_{iX} is the standard deviation of the X indicator's behavior of i trader; n represents the number of traders.

Follower's learning efficiency was measured by the reciprocal value of the number of copy trades before the first manual trades performed by this follower (Higgins et al. 2008). Follower's learning efficiency is shown in Equation 2 below:

$$\text{Follower's Learning Efficiency} = 1/T_{Copy\ Trades} \quad (2)$$

where $T_{Copy\ Trades}$ is the number of copy trades before the first manual trades performed by the follower.

Traders' trading profitability was constructed as the ratio of profitable trades out of all the trades performed by the traders (Lee and Ma 2015). Similar to traders' trading consistency, we calculated the average trading profitability of all the traders followed by the follower to measure the trading profitability observed by a follower, as shown in Equation 3 below:

$$\text{Traders' Trading Profitability} = (\sum_{i=1}^{n} T_{i\ win\ trades}/T_{i\ all\ trades})/n \quad (3)$$

where i represents a trader followed by the follower; $T_{i\ win\ trades}$ represents the amount of profitable trades copied from trader i before the first manual trading of the follower; $T_{i\ all\ trades}$ represents the amount of all trades copied from trader i before the first manual trading of the follower; n represents the number of traders followed by this follower.

To operationalize *follower's learning effectiveness*, we chose the *cosine similarity* of trading behaviors between follower and traders based on four indicators which are *lots, open positions, position duration,* and *drawdown*. The cosine similarity is a commonly used metric to measure the similarity which descripts the common features between two samples (Xia et al. 2015). The similarity of trading behavior between traders and follower reflects the learning effectiveness in a way that how followers can behave like traders. The cosine similarity of trading behaviors between the follower and a trader is shown in Equation 4 below (Nguyen and Bai 2010):

$$\text{Similarity}_i = (V_{Follower\ behaviors}{}^T * V_{Trader\ i\ behaviors})/(\|V_{Follower\ behaviors}\|\ \|V_{Trader\ i\ behaviors}\|) \quad (4)$$

where i represents a trader followed by the follower; $V_{Follower\ behaviors}$ is the vector of follower's trading behaviors measured by lots, open positions, position duration, and drawdown; $V_{Trader\ i\ behaviors}$ is

[1] Because analytical results show that the *t-statistic* of the item "currencies" is less than 1.960 (*t-statistic = 1.135*), we have opted to drop this item when calculating consistency (Wong, 2013).

the vector of trader i's trading behaviors measured by lots, open positions, position duration, and drawdown.

Then the follower's learning effectiveness is measured by the average cosine similarity between the follower and all the traders he/she follows:

$$\text{Follower's Learning Effectiveness} = \sum_{i=1}^{n} Similarity_i \,/n \quad (5)$$

where i represents a trader followed by the follower; $Similarity_i$ is the cosine similarity of trading behaviors between this follower and trader i; n represents the number of traders followed by this follower.

Follower's profitability was measured by the return of the follower's first batch of manual trading which means one or more consecutive transactions in the first manual trades. Follower's profitability is shown in Equation 6 below:

$$\text{Follower's profitability} = \sum_{j=1}^{n} Return_j \quad (6)$$

where n represents the number of trades in the first batch of manual trading; Return_j is return of trade j.

The operationalization of each construct and the result of descriptive analysis are displayed in Table 1.

Variable	Measurement items	Mean	Min	Max	SD
Traders' Trading Consistency (all measurement items were min-max transformed and reversed)	Lots consistency	-0.00	-0.04	0.00	0.01
	Open positions consistency	-0.01	-0.09	0.00	0.01
	Position duration consistency	-0.15	-0.48	0.00	0.11
	Drawdown consistency	-0.001	-0.01	0.00	0.002
Traders' Trading Profitability	Win trades percentage	0.53	0.00	1.00	0.35
Follower's Learning Efficiency	Reciprocal copy trades	0.20	0.00	1.00	0.30
Follower's Learning Effectiveness	Cosine similarity	0.92	0.01	1.00	0.20
Follower's Profitability on the First Manual Trades	First manual trading return	227.4	-1627.4	15752.5	1540.3

Table 1. Construct Measurement and Descriptive Statistics

Analytical Results

We examined the hypotheses using the technique of partial least square with SmartPLS v.3.2.8. Control variables were included in this model, which are the numbers of follower's manual trades in the first manual trading, number of follower's daily manual trades, number of traders followed by the follower, length of time between first copy trading and first manual trading. As Figure 1 shows, the relationship between traders' trading consistency and follower's learning efficiency is positively significant (β_1 = 0.576, t = 12.049), which supports Hypothesis 1. Similarly, the positive relationship between traders' trading profitability and follower's learning effectiveness proposed in Hypothesis 2 is supported (β_2 = 0.174, t = 2.303). Results also validate Hypothesis 4 on the positive relationship between follower's learning effectiveness and follower's profitability on the first manual trades (β_4 = 0.185, t = 2.437). However, follower's learning efficiency exerts nonsignificant influence on follower's profitability on the first manual trades (β_3 = -0.031, t = 0.558). Relationship proposed by Hypothesis 3 is unsupported by this dataset. Control variables generates no effect on the follower's profitability on the first manual trades.

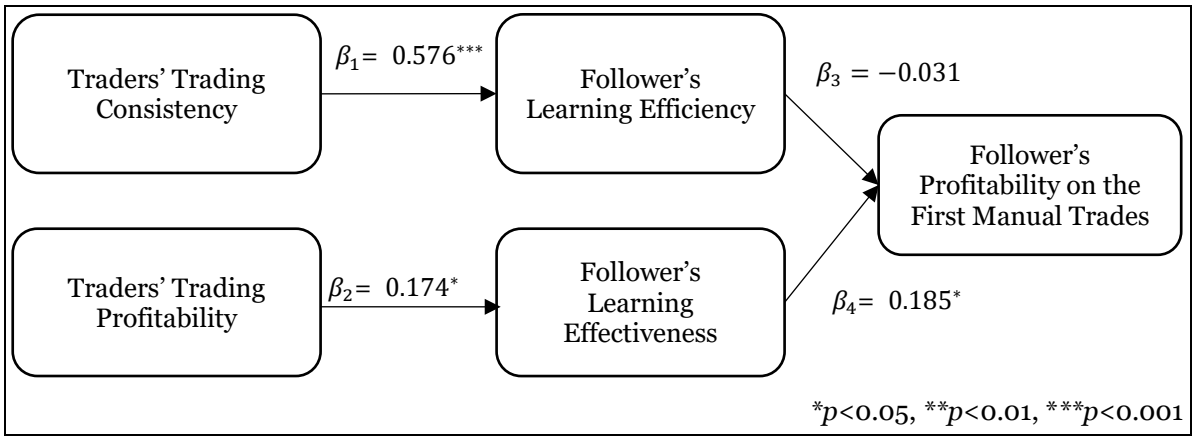

Figure 1. Results of the Structural Model [N=114]

Robustness Check

To check the robustness of analytical results, we firstly examined the relationship between quadratic effect of follower's learning efficiency on follower's profitability on the first manual trades. The estimated coefficient shows that the quadratic effect of learning efficiency has insignificant influence on profitability on the first manual trades (β_5 = -0.004, t = 0.067).

Moreover, we analyzed a model including two relationships that are not hypothesized in this study. First, the consistency of traders' trading only captures the ease of learning by inducing a faster learning speed among followers. Consequently, learning effectiveness, which is operationalized as the performance of follower's first manual trade, has no relationship with the ease of learning. Analytical results demonstrate that the relationship between traders' trading consistency and follower's learning effectiveness (β_6 = -0.174, t = 1.187) is statistically insignificant.

Second, traders' trading profitability reflects followers' anticipation of future return since the latter can emulate the former's trading pattern as measured via learning effectiveness. In this sense, the speed of learning should be independent of traders' profitability because a profitable trading portfolio could be either simple or complex. Indeed, analytical results indicate a statistically insignificant relationship between traders' trading profitability and follower's learning efficiency (β_7 = 0.194, t = 1.907). From above, we are confident that our empirical findings should be reasonably robust.

Expected Contribution to Theory and Practice

This study seeks to contribute to the contemporary knowledge on social trading in three fronts. First, conceiving forex social trading platforms as a learning field for immature investors to gain skills toward independent traders, this study is a pioneering effort in investigating the follower's learning behaviors in copy trading and its effect on their first manual trading. Specifically, we draw on the observational learning theory (Shea et al. 1999) to uncover how followers can learn from copy trading and put their learning achievements into practice by conducting manual trading. Second, Hypothesis 1, Hypothesis 2 and Hypothesis 4 are supported by the empirical evidence. In other words, we found that learning efficiency can be enhanced through consistency in observed trading behaviors whereas learning effectiveness can be improved via the profitability of observed trading behaviors. Learning effectiveness, in turn, will lead to better performance when learners start their own trade. We consolidate extant literature on observational learning and advance learning efficiency and learning effectiveness as the core yardsticks of followers' learning performance and articulate how follower's learning performance could be shaped by traders' trading behaviors and performances. Third, since Hypothesis 3 is unsupported, it implies that follower's learning efficiency plays an equivocal role in affecting followers' profitability on first manual trades. While prompt practice test embodies followers' self-confidence on their competence in carrying out independent trades, such narcissism may impede the transfer of confidence in learning to actual performance (Campbell et al. 2004). Findings from this study also offer practice guidelines for building the learning system and

optimizing recommendations on forex social trading. First, our findings on the decisive role of traders' trading consistency on enticing followers' practicing appetency could assist forex social trading platform to improve the presentation of trader's trading history. Specifically, platform practitioners could incubate more followers to become leading traders and promote the learning system by including traders' behavioral consistency in forex market as a core metric of their trading strategy. Second, our results on how learning effectiveness could bolster followers' performances not only confirm Berger et al. (2018)'s speculation on the power of emulation on social trading environment, but encourage nascent investors to consider such novel financial market as a self-learning court where they could improve and adjust their trading strategies via trial-and-error process (Vollmeyer and Rheinberg 2005). To further expand on the empirical findings of this study, we will take other variables (e.g., learning strategy and learning pattern) into account. At the same time, we will enlarge the dataset and enrich our indicators for calculating the variables (e.g., traders' trading consistency and learning effectiveness) under consideration.

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