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The Profitability of Day Trading and the Characteristics of Traders: Evidence from the Taiwan Futures Market

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A B S T R A C T

Day trading has gained extensive popularity among investors, but its profit potential remains a controversial issue. This study examines how the profitability of day trading is related to the different characteristics of day traders in the Taiwan futures market. The results suggest that employing day trading strategies may make it difficult for individual traders to obtain positive net returns. Nevertheless, prior trading experience and sufficient financial sophistication improve the profits individual traders gain. In addition, the day trading of short positions does not generate positive net profits over the sample period for both foreign and local institutional investors.

Keywords: day trader, futures market, investor performance, individual traders, learning
JEL Classification: D14, G G11

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1. Introduction

Financial futures trading offers market participants with opportunities to speculate on the future price movement of a certain underlying asset. While it is possible for traders to realize profits in a short period of time from speculation in futures contracts, the risk of a loss through such trading can also be quite substantial. In many instances, active traders are attracted to the notion of day trading futures contracts as they provide a high degree of leverage without the risks of holding them overnight. Nevertheless, day trading in the futures market can be a challenging strategy to profitably implement.

While day trading triggers extensive interest from investors, there can be considerable risks of loss associated with this type of speculative trading. Several investigations into the nature of day trading were conducted by the U.S. Securities and Exchange Commission (SEC) based on data from small samples of brokerage accounts. The investigations suggest that only a very small portion of day trading beginners ever earn positive profits. Even for day traders who have enough experience in the marketplace and have sufficient capital to capitalize on intra-day price fluctuations, most of them lose money. Different findings have been obtained by Harris and Schultz (1998), who examined approximately 20,000 records on the orders that individual investors placed through Nasdaq's Small Order Execution System (SOES) over a period of three weeks. Their study found that day traders on average earn only a small profit per contract. Garvey and Murphy (2001) presented that limit order traders engaging in proprietary day trading also earn positive profits through their electronic crossing networks (ECNs) trading. The dataset in their study contains 400,000 equity trades conducted by 26 proprietary traders and 1360 non-proprietary traders over a three-month sample period. Nevertheless, several studies suggest that day trading is a much more difficult strategy to make profits than the industry claims. In a study of day-trading profitability, Jordan and Diltz (2003) matched buy and sell orders using data provided by a nationwide securities firm in the U.S. and generated a dataset covering approximately 330 traders over a 21-month period. Their results showed that the number of day traders earning negative net profits is twice the number of day traders earning positive net profits.

One of the controversial issues relating to day trading is its profit potential. Transaction costs can be excessive in a strategy that involves frequent trading, and these costs are one of the critical factors that need to be considered when evaluating the profitability of day trading. The studies by Barber and Odean (1999) and Barber, Lee, Liu, and Odean (2009, 2012) found that transaction costs damage the profits of day trading in the Taiwan stock market. When transaction cost is taken into account, high-frequency trading tactics, in many cases, may not be as profitable as they are commonly depicted to be.

There are other factors that may influence the profitability of day trading. The performance of traders may be associated with their cognitive abilities, trading skills, and trading style. Nicolosi, Peng and Zhu (2009) analyzed whether individual investors learn and accordingly adjust their investment activities, with results showing that investment experience improves the chance of a profitable investment for individual investors. There are also several studies on investors' learning and trading behavior that focus on day traders. Seru, Shurmway and Stoffman (2009) examined the performance and learning by individual investors undertaking day trading, suggesting that while individual day traders speculate in order to evaluate their ability to profit from day trading, they also perform better with trading experience. Graham, Huang and Harvey (2009), Yeoh and Wood (2011), and Kuo and Lin (2013) investigated the influence of trading knowledge and skills on day trading activities, documenting that experienced day traders are inclined to take risks, thus leading them to undertake aggressive trading. Nevertheless, the role that trading experience performs on the profits from day trading is limited. In addition, in a study on whether investors rationally speculate and learn as day traders, Barber, Lee, Liu and Odean (2014) reported that the day trading volume conducted by individual investors increases along with the more trading experience that individual investors obtain.

Several prior studies on investor behavior have suggested that investors are subject to behavior bias in their decision-making process, finding them to be overly optimistic in assessing their knowledge, skills, and abilities to exploit the profit opportunities created by mispricing [Barber and Odean (2001), Graham, Huang and Harvey (2009), Yeoh and Wood (2011), Kuo and Lin (2013), Barber, Lee, Liu and Odean (2014)]. Previous research studies also suggested that the investment activities of investors may sometimes be driven by sensation seeking, as investors tend to seek out novel, intense, and complex experiences that are normally accompanied by risks [Grinblatt and Keloharju (2009), Kumar (2009)]. Furthermore, a number of prior studies on information asymmetry in financial markets have noted that some investor groups have a better chance to access private information and thereby have advantages over others in predicting the price movements of securities [Coval and Moskowitz (1999), Dvorak (2005), Bae et al. (2012), Lien, Tseng and Wu (2013)].

Investors of different types may nevertheless be influenced by psychological bias differently when evaluating securities or taking investment actions and may also display different levels of sensation seeking behavior. Moreover, they may have different levels of capacity to obtain high-quality, private information that helps deliver information advantages. As such, how the trading experience, trading knowledge and skills, and trading strategies influence the trading profits from day trading may vary among different types of day traders. The difference may depend on the extent to which psychological factors affect the trading behavior of traders, as well as the quality and quantity of information to which traders have access.

There has been an increasing interest in the study of day trading in stock markets in recent years, yet, there have been very few studies on day trading in the futures market. The volume of futures contract trading in the Taiwan Futures Exchange has been increasing over the past few years. Traders actively participate in the Taiwan futures market, as it appears that futures trading is far less expensive to get into, due to low transaction costs and few trading restrictions. In addition, improvements in the Taiwan Futures Exchange have been made over the past few years through the disclosure of trading information and the stability of the trading system. The Taiwan government has also undertaken policy measures to reduce the probability of the occurrences of default on future contracts and to encourage traders to trade them. Furthermore, as the initial margin requirement was cut by 50% for day trading in the Taiwan futures market since October 2007, futures trading has increased dramatically.

In this study we examine the day trading activities in the Taiwan futures market in order to investigate whether and how the profitability of day trading is related to trading experience, trader sophistication, and trading strategies, among various types of day traders. The analysis of this study takes into account the transaction costs incurred during day trading practices. The remainder of this paper is organized as follows. Section II reviews the relevant literature. Section III presents the methodology. Section IV reports the empirical results. Finally, Section V concludes this paper.

2. Literature review

Following Previous research studies on the profitability of day traders' investments have produced mixed results. While some market analysts stated that traders may gain by conducting a strategy of day trading, several researchers argued that high frequent trading may incur ruinous transaction costs. Harris and Schultz (1998) studied the individual investors who conduct day trading via NASDAQ's Small Order Execution System (SOES). Their study found that individual investors make money from day trading despite their lack of market information, while market makers lose money on such trading. Jordan and Diltz (2003) examined whether U.S. day traders obtain a positive return on investment with

results showing that transaction costs damage the profits from day trading. Furthermore, there are almost twice as many day traders who lose money as day traders who gain. Linnainmaa (2005) displayed that profits from day trading are negatively influenced by transaction costs in the Finland stock market. A study by Lee and Wang (2016) nevertheless suggested that individual investors overall obtain positive returns by day trading on short-selling positions in the Korean stock market, even when accounting for transaction costs. Profitability from short-selling is found to be contingent on the timing of short-selling and covering transactions.

Although most previous studies on day trading have focused on international market research, several studies have looked at the financial markets in Taiwan. Barber, Lee, Liu and Odean (2009) studied the behaviors of day traders using intra-day data from 1995 to 1999 in the Taiwan stock market and pointed out that the volume of day trading accounts for 20 percent of all trading of stocks in the market. Aggregative investors, also called heavy day traders, obtain positive returns on investment when transaction costs are not taken into account. However, once taking into account transaction costs, profits of heavy day traders decrease, and only a small fraction of those traders still earns large profits. Barber, Lee, Liu, and Odean (2012) investigated the return of trading of speculative traders and the characteristics of day traders from 1992 to 2006. They found that profits from day trading are affected by transaction costs, and that day trading activity is positively related to trading experience. Nevertheless, more trading experience does not contribute to higher trading profits.

Prior literature on day trading has mostly focused on stock markets, with only few studies conducted on day trading activities in the futures market. Kuo and Lin (2013) investigated the overconfident behavior and performance of individual day traders for the period from October 8, 2007 to September 30, 2008 in the Taiwan futures market. Their research results showed that most individual day traders lose money even if the transaction cost is not taken into account. They also found overconfidence among individual day traders in the futures market. Their findings are compatible with the views of Gervais and Odean (2001), who suggested that some day traders tend to be overconfident and systematically biased in the interpretation of the information they receive. Ryu (2012) studied whether various investors gain from trade and investigated the characteristics of various traders in the KOSPI 200 futures market. The research results indicated that individual traders who conduct day trading lose money. As the frequency and the volume of trading rise up, the losses that day traders suffer from will increase.

The performance of investors can be attributed to their learning behavior, the trading skills that they possess, and the trading strategies that they choose. There are several research studies that investigated the learning and trading behavior of investors. Korniotis and Kumar (2009) documented that the performance of investors can be partly traced to their cognitive ability to pick stocks, market timing, and trade executions. Grinblatt, Keloharju, and Linnainmaa (2010) suggested that investors learn about their own ability from trading. The differences in the levels of intellectual ability are attributed to the variation in investment activities and trading performance among investors. The disposition effect is typically observed in the trading behavior of investors, and the study's results suggested that investors with higher intellectual ability are less prone to the disposition effect than others. The results also suggested that investors with higher intellectual ability are likely to possess trading skills more superior than others. As such, investors with higher intellectual ability are able to obtain higher profits. Similar learning behavior is found in a study of individual investors by Nicolosi, Peng and Zhu (2009), who provided evidence that the trading intensity of individual investors is correspondingly adjusted, subsequent to the performance of investors over previous trading periods. Moreover, the extent of the adjustments in response to previous gains is found to be larger than to previous losses. The past trading experience of individual investors is found to improve the profitability of investment.

There are also few studies on the learning behavior of traders that have addressed the behavior of day traders. Seru, Shurmway and Stoffman (2009) analyzed whether trading performance is related to learning for individual traders who undertake day trading. The empirical findings of their study suggested that individual day traders speculate in order to learn about their inherent ability and to improve their ability to profit from day trading. Investors of less financial sophistication learn faster than sophisticated investors. Furthermore, as individual investors become more experienced and can assess their own ability more accurately, they not only trade more intensively, but also obtain better performance. Compatible with the findings obtained in Seru et al., the empirical results of Kuo and Lin (2013) and Barber, Lee, Liu and Odean (2014) suggested that individual day traders with more trading experience tend to conduct more excessive trading.

Excessive trading by investors who have underperformed the market can be traced to overconfidence and the desire to gamble. Barber and Odean (2001) found that investors are inclined to put irrationally excessive confidence in the accuracy of their information and their interpretation of the information tends to be biased. A relevant paper by Graham, Huang and Harvey (2009) reported that investors with overconfidence in their abilities in the interpretation of information are more willing to engage in trades based on their judgement, resulting in excessive trading activities. Yeoh and Wood (2011) also provided evidence that relates trading activity to confidence. The findings of the study indicated that the trading activities conducted by investors who are identified as being more overconfident tend to be frequent but of small size, compared with trades carried out by less overconfident investors. In addition, Grinblatt and Keloharju (2009) and Kumar (2009) found that investors who are more confident in their abilities and beliefs and those investors with a higher level of sensation seeking engage in trade more frequently.

Only a few research studies on overconfident trading activities have focused on day traders. A study of individual day traders by Kuo and Lin (2013) obtained results similar to the findings of Yeoh and Wood (2011). The results of the former study suggested that overconfident traders may not be able to effectively learn from their prior trading experience. As such, experience does not help overconfident traders improve their trading skills to mitigate their losses in day trading. In addition, Barber, Lee, Liu and Odean (2014) found that day traders continue to irrationally carry out day trading activities, even when the profits they earn from day trading have been persistently negative.

Several studies have found that the performance of investors can also be attributed to the relative information advantage they have over other market participants. Information advantage may bring about superior investment performance. Massa and Simonov (2006) and Ivkovic, Sialm, and Weisbenner (2008) reported that better-informed traders outperform less-informed traders, through a deliberate selection of stocks or by holding concentrated portfolios consisting only of stocks in which they have a relatively information advantage.

3. Methodology

This study uses six characteristics variables as proposed by Barber, Lee, Liu and Odean (2012) to represent the characteristics of traders. The profits from around-trip day-trade, past trading performance, trading experience, trader sophistication, and trading activities are measured for each day trader j. Logistic regressions are then estimated separately for each type of day traders.

$$\ln\left(\frac{p}{1-p}\right)_g = \alpha + \beta_1 \cdot x_{1g} + \beta_2 \cdot x_{2g} + \beta_3 \cdot x_{3g} + \beta_4 \cdot x_{4g} + \beta_5 \cdot x_{5g} + \beta_6 \cdot x_{6g}, \quad (1)$$

where p denotes the probability of making profits in day trading for trader j; g denotes the type of the trader; x_{1g}, x_{2g}, x_{3g}, x_{4g}, x_{5g}, and x_{6g} denote the variables Sharpe Profit, Sharpe Return, Log Volume, Percent Short, Fraction DT, and Log Experience, respectively; and β_i is a coefficient, for $i = 1,...,6$.

First of all, there are two variables that measure the past trading performance of a day trader: the Sharpe Profit and the Sharpe Return. The Sharpe Profit is the mean daily profits from day trading divided by the daily standard deviation of the profits. The Sharpe Return is the mean daily returns from day trading divided by the daily standard deviation of the returns. Second, a variable Fraction DT is included in the regression to analyze whether traders make profits from day trading futures contracts. It is the fraction of a trader's total trading volumes that are related to round-trip transactions in a single trading day. In addition, a day trader's sophistication is measured by Percent Short, which is the ratio of the volume of day trading on short positions to the total day trading volume undertaken by a trader in a single trading day. Lastly, the experience of a day trader is measured by Log Experience and Log Volume. Log Experience is the log of the number of days in which a trader conducts day trading before the start of the main sample period. Log Volume denotes the log of total dollar volume of futures trading that a trader engages in prior to the main sample period examined in this study. The main sample period is the time period over which a logistic regression analysis is performed to examine the impacts of trader characteristics on the profitability of day trading.

The net profit a day trader makes is the dependent variable in the regression analysis. The variable takes on a value of one if the net profit a day trader makes is positive and zero otherwise. The independent variables are the proxies that represent the characteristics of traders, such as their past performance, trading knowledge and skills, trading experience, and trading strategies.

A separate logistic regression analysis is performed for each different type of traders. If the p-value of the coefficient estimate is less than 0.05, then it is inferred that the correlation between the independent variable in the model and the net profits from day trading is statistically significant at the 5% significance level. Conversely, if the corresponding p-value is greater than 0.05, then it is inferred that the correlation is not statistically significant at the 5% significance level.

4. Empirical Results and Analysis

A. Data Description

We used a microstructure dataset obtained from the Taiwan Futures Exchange (TAIFEX) that contains the complete transaction history of all traders on the Exchange. Due to data availability, the sample covered the period of January 1, 2008 to March 31, 2009. Figure1 shows the trading volume of all futures contracts. By observing all twelve types of futures products traded in the TAIFEX, we find that the Taiwan Stock Exchange Index Futures (TXF), the mini-Taiwan Stock Exchange Index Futures (MXF), the Financial Sector Futures (FXF), and the Electronics Sector Futures (EXF) are the four major futures products traded in the market, with relatively high trading volume among all futures products on average. As such, these four stock index futures contracts are chosen for study in this paper. The dataset contains all transaction records of each trader in every transaction day during the sample period. With the complete record of transactions, we can identify the date and the time of the transaction, the broker code, the identity of the trader, the trader code, the buy or sell code, and the price and the quantity associated with each transaction.

In this paper we define the day trader as a person who has conducted day trading during our sample period. We refer to the academic literature and classify day traders into five categories based on the trader code of investors: local institutional investors, dealers, foreign investors, individual traders, and market makers. In our sample, the total number of traders denotes the sum of the number of traders who conduct day trading and the number of traders who conduct non- day trading. Figure 2 displays the population number of each category of traders and the number of day traders in each of the five categories. Figure 2 shows that the population of individual traders is 109,221 people, including 40,277 individual day traders. The number of individual day traders is the largest among all five types of day traders in the Taiwan futures market. The population of market makers and foreign traders who engage in day trading activities are relatively small, compared with the population of individual day traders. However, the proportions of traders undertaking day trading are high, among market makers and foreign traders. Twelve of 28 market makers conduct day trading, and 164 of 361 foreign investors conduct day trading.

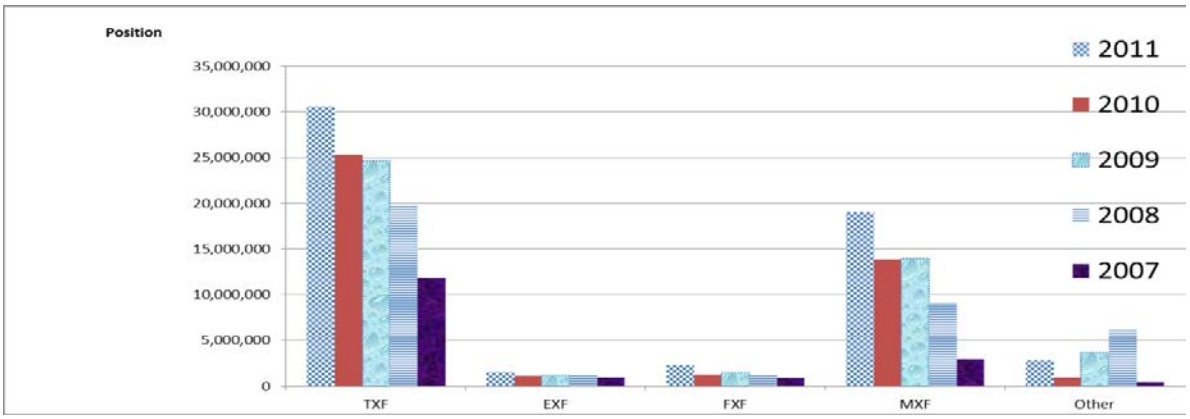

Figure1: Trading Volume of Taiwan Futures Contracts, 2007-2011

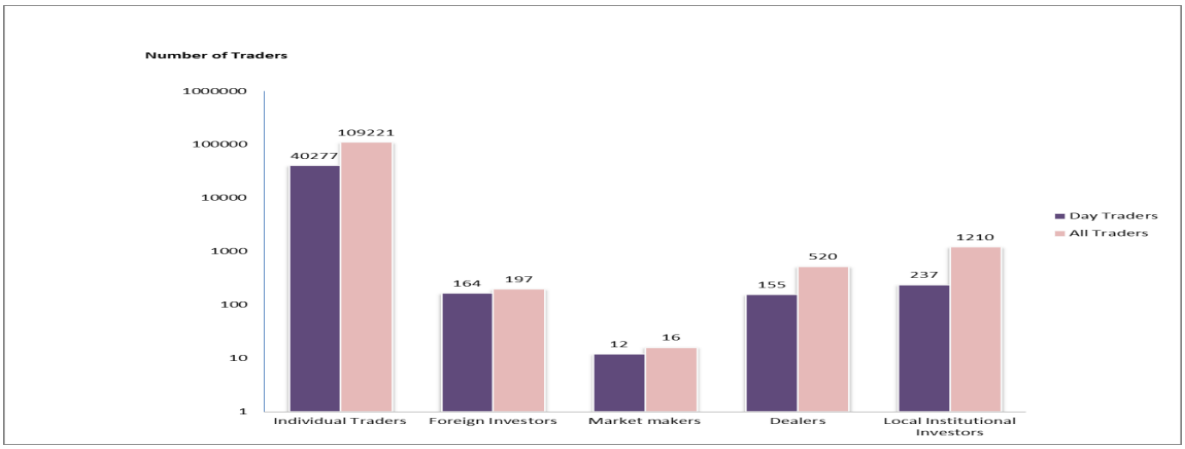

Figure2: Number of Day Traders in Each of the Five Categories of Traders

Table 1 reports the aggregate trading activities and the day trading activities classified based on investor types. A large amount of day trading volume is created by individual traders, who account for over 60 percent of the total volume of day trading. The day trading volume conducted by market makers and dealers records a modest ratio of 20.69% and 15.09% to the total day trading volume, respectively. The day trading volume of foreign investors is relatively small, making up 3.38% of total day trading

volume in the Taiwan futures market. The least amount of day trading volume is created by local institutional investors, who consist of 0.6% of total volume of day trading in the market.

Table 1: Aggregate Volumes Based on Investor Categories for Each Day, January 1, 2008 to March 31, 2009

	All Trade[1]		Day Trade[2]	
Investor Category	Volume	Percentage of All Trades (%)	Volume	Percentage of Day Trading (%)
All Day Traders	79,821,412	100.0	63,752,560	100.0
Individual Traders	51,431,981	64.43	38,406,864	60.24
Foreign Investors	3,480,850	4.36	2,155,722	3.38
Market Makers	13,249,645	16.59	13,192,664	20.69
Dealers	11,175,134	14	9,620,614	15.09
Local Institutional Investors	483,802	0.62	376,696	0.6

Note: 1. All trades denote the aggregate volumes of buys and sells.
2. Day trading denotes the aggregate volumes of round-trip trades

Ever since October 2007, traders who commit to close out trading positions on the same day the positions are opened are offered a 50 percent discount on the initial margin requirement in the Taiwan futures market. Nevertheless, under the regulations of the clearing mechanism, individual traders who hold open position on futures may sometimes face pressure of capital turnover. To participate in the futures market, traders must have capital above the margin. If traders lack capital in their accounts, then their trading positions will be closed. Compared with institutional traders, the amounts of capital individual traders have may be relatively small. Individual traders without sufficient capital may not be able to afford the risk of holding a large open position. As such, they may tend to engage in day trading more often than others. Local institutional investors often possess sufficient capital and may also employ hedging strategies more often than speculating strategies in the futures market. As such, the percentage of day trading volume conducted by local institutional investors is small, compared with that by individual investors. Several previous literature studies suggested that the population of individual day traders and the day trading volume conducted by individual day traders are large in the Taiwan stock market. Our results report the presence of similar features in the Taiwan futures market.

B. The Performance of Day Traders

The performance estimation is based on the net return on investment, which is obtained by subtracting the transaction cost from the gross return from all round-trip trades within the same trading day. The gross return of a trader at day t is calculated as follows:

$$\pi_{gt}^{gross} = \frac{\sum_i \sum_j \left(S_{ijt}^L - B_{ijt}^L\right) + \left(S_{ijt}^S - B_{ijt}^S\right)}{\sum_i \sum_j \left(S_{ijt}^L - B_{ijt}^S\right)}, \quad (2)$$

where g denotes the type of trader, and B and S respectively denote the dollar value of buys and sells on day t in futures contract i by investor j. The superscript L indicates a long position, and the superscript S indicates a short position. Investor j is a type g trader.

The net return of the trader on day t is calculated as follows:

$$\pi_{gt}^{net} = \pi_{gt}^{gross} - T, \quad (3)$$

where T denotes the aggregate transaction costs, including the transaction fee and transaction tax. We generalize an average of the transaction fee from the majority of the dealers in Taiwan, i.e., KGI Securities, Yuanta Futures, Capital Futures, and SinoPac Futures. The tax payment is estimated by multiplying the value of the futures contract by 0.0004, which is the tax rate set by Taiwan's Ministry of Finance. The transaction cost is calculated based on the sum of transaction fee and transaction tax. Table 2 displays the average rate of return on round-trip day trades by different types of traders.

Table 2: Gross and Net Rate of Return on Round-trip Trades

Type of Traders	Day Trading Return[1]	
	Gross Return (%)	Net Return (%)
Individual Investors	-0.0817	-0.7066
Foreign and Aggregate Institutional Investors	0.3859	-0.1287
Foreign Investors	0.0374	-0.5679
Market Makers	0.4843	0.0445
Dealers	0.3743	-0.1531
Local Institutional Investors	-0.7510	-3.0181

Note: 1. Day trading return is the returns that day traders make on round-trip trades.

C. The Relations between the Net Profits from Day Trading and the Characteristics of Day Traders

This section performs a logistic regression analysis to examine the relations between the net profits from day trading and the characteristics of five types of day traders. The five types of day traders are individual traders, foreign investors, market makers, dealers, and local institutional investors. Table 3 reports the results of analysis.

Panel A of Table 3 presents empirical findings on the factors that influence the net profits individual day traders make from day trading. There are four variables of which their coefficient estimates are statistically significant at the 5% significant level. Fraction DT is significantly, negatively correlated with the net profits from day trading for individual day traders. Frequent trading is often associated with high transaction costs. The results of this study suggest that day trading is hazardous to the wealth of individual investors. Nevertheless, the experience of individual day traders, as measured by Log Volume and Log Experience, is found to have positive, significant impacts on their net profits from day trading. These findings suggest that, when individual traders conduct the strategy of day trading, they learn from their trading experiences. Prior trading experience improves their ability to profit from day trading. The findings are compatible with the results from a study on day trading in stock market by Barber, Lee, Liu, and Odean (2012). Moreover, net profits from day trading are significantly, positively correlated with Percent Short. The results suggest that the financial sophistication of individual traders has a positive influence on the net profits that individual traders gain from day trading. Possessing sufficient experience and knowledge in assessing the risks and merits involved in a trading opportunity may help individual traders improve their performance in day trading.

Several previous studies of behavioral finance have found that psychological bias is commonly observed in investors' trading behavior. Brown et al. (2006), Chen et al. (2007), and Choe and Eom (2009) found that psychological bias is more prevalent among investors with less trading sophistication. In most cases, individual investors are financially less sophisticated than aggregate institutional investors. As such, individual investors may suffer from psychological bias to a greater extent than aggregate institutional investors.

The results of this present study are compatible with the findings from previous studies. This study finds that the performance of individual traders will improve when individual traders become sophisticated financial traders. The results imply that when the trading behavior of individual investors becomes less prone to psychological bias, their performance gets better. Coefficient estimates for the Sharpe Profit and the Sharpe Return variables are not statistically significant, meaning that the profits individual traders make from day trading in the next periods may not be correlated to their past trading performances. The results are consistent with the findings of Kuo and Lin (2011). Overconfident, individual day traders tend to overestimate their actual ability or the accuracy of their information. Their performance of the previous period does not affect their trading activities in the next period.

Table 3: Logistic Regression of the Relationship between the Net Profits and Characteristics of Day Traders

Panel A: Individual Traders

Variable	Coeff	Std Error	T-Stat	
Constant	-4.26056439	0.05823233	-73.16493	**
SHARPE PROFIT	0.00002153	0.00004457	0.48310	
SHARPE RETURN	0.00003354	0.00002564	1.30798	
LOG_VOLUME	0.00709250	0.00224628	3.15745	**
PERCENT SHORT	11.18616290	0.30310796	36.90488	**
FRACTION DT	-2.53672754	0.15002750	-16.90842	**
LOG_EXPERIENCE	0.11819671	0.01234289	9.57610	**

Panel B: Foreign Investors

Constant	33.01663845	8.56232960	3.85603	**
SHARPE PROFIT	-0.01822058	0.03728398	-0.48870	
SHARPE RETURN	0.02169512	0.04115470	0.52716	
LOG_VOLUME	0.12566641	0.07412921	1.69523	
PERCENT SHORT	-67.52778034	17.77272206	-3.79952	**
FRACTION DT	1.32045462	1.93909230	0.68097	
LOG_EXPERIENCE	-0.40893637	0.38369248	-1.06579	

Panel C: Market Makers

Constant	2567.770522	1513.459022	1.69662
SHARPE PROFIT	-0.010225	0.029058	-0.35188
SHARPE RETURN	0.000461	0.000603	0.76492
LOG_VOLUME	-0.392461	0.348627	-1.12573
PERCENT SHORT	-4028.112767	2390.218319	-1.68525
FRACTION DT	-547.304704	322.769496	-1.69565
LOG_EXPERIENCE	-0.436627	2.366279	-0.18452

Panel D: Dealers

Constant	0.098142957	2.472945528	0.03969
SHARPE PROFIT	0.003219348	0.011808201	0.27264
SHARPE RETURN	-0.016631061	0.014755265	-1.12713
LOG_VOLUME	-0.051272051	0.036968336	-1.38692
PERCENT SHORT	-4.132973955	4.268952840	-0.96815
FRACTION DT	0.039931765	1.387049978	0.02879
LOG_EXPERIENCE	0.379082900	0.224302820	1.69005

Panel E: Local Institutional Investors

Constant	-2.143801876	0.967086043	-2.21676	**
SHARPE PROFIT	0.033706072	0.043386095	0.77689	
SHARPE RETURN	0.003851218	0.003963545	0.97166	
LOG_VOLUME	-0.040652562	0.051586729	-0.78804	
PERCENTSHORT	-6.428232733	2.060259689	-3.12011	**
FRACTION DT	4.939598440	1.368783871	3.60875	**
LOG_EXPERIENCE	0.319265482	0.329009180	0.97038	

Note: **denotes that the variable is significant at the 5% significance level.

Panel B of Table 3 shows the relationship between the characteristics of foreign traders and their net profits from day trading. The results show that one variable, Percent Short, exhibits a coefficient estimate that is statistically significant at the 5% significance level. The correlation between Percent Short and the net profits from day trading is found to be negative, suggesting that a high percentage of day trading on short positions may reduce the profits from day trading in the Taiwan futures market for foreign traders.

Panel C of Table 3 displays the relationship between the characteristics of market makers and their performance in day trading. The results show that none of the coefficient estimates corresponding to the characteristics of traders is statistically significant. Past trading performance, trading sophistication, and trading experience may not directly affect the future net profits from day trading for market makers. One thing to note is the small number of observations from market markers in our sample, which is 12.

Panel D of Table 3 reports the empirical results of the relationship between the characteristics of dealers and their performance at day trading. The net profits that dealers achieve through day trading are not statistically, significantly related to the characteristics of dealers.

Panel E of Table 3 documents the influence of the characteristics of local institutional investors on their net profits from day trading. There are two variables, Percent Short and Fraction DT, of which their parameters are statistically significant at the 5% significance level. The net profits from day trading are significantly, positively correlated with Fraction DT for local institutional investors. The results suggest that undertaking day trading activities may improve the performance of local institutional investors. Nevertheless, the net profits from day trading are significantly, negatively correlated with Percent Short. The findings imply that a high proportion of day trading with a short position may reduce the trading performance of local institutional investors in the Taiwan futures market. The coefficient estimates of the other variables are not statistically significant.

Barber, Lee, Liu and Odean (2009) examined the trading performance of a portion of individual day traders, called heavy day traders. The results of their study found that heavy day traders generally lose money trading in the stock market. In this present study, individual day traders who conduct day trades with a minimum of 1,000 trading units in a month are defined as heavy day traders. The definition as used in this study follows the definition provided by four major dealers in Taiwan, i.e., KGI Securities, Yuanta Futures, Capital Futures, and SinoPac Futures. These dealers provide discounts to investors whose trading volume is over 1,000trading units. The correlation between the performance of heavy day traders and the characteristics of them is now analyzed with the empirical results displayed in Table 4. Two characteristic variables of heavy day traders, Percent Short and Log Volume, have negative, significant effects on the net profits from day trading. For individual day traders who have a relatively large amount of trading capital, a high proportion of day trading on short positions may reduce the profits from day trading in the Taiwan futures market. The results are, to some extent, similar to those for foreign traders and local institutional traders.

Table 4: Logistic Regression of the Relationship between the Net Profits and Characteristics of Heavy Day Traders

Variable	Coeff	Std Error	T-Stat	
Constant	3.708097591	1.034483989	3.58449	**
SHARPE PROFIT	0.000705437	0.007382024	0.09556	
SHARPE RETURN	0.000157391	0.000483288	0.32567	
LOG_VOLUME	-0.051522728	0.021267968	-2.42255	**
PERCENT SHORT	-6.133408635	2.121521572	-2.89104	**
FRACTION DT	-1.524532756	1.068304659	-1.42706	
LOG_EXPERIENCE	0.249362093	0.163159692	1.52833	

Note: ** denotes that the variable is significant at the 5% significance level.

In summary, some characteristics of traders affect their day trading performance. Employing day trading strategies is hazardous to the wealth of individual investors. Nevertheless, individual traders learn from their trading experience. Prior trading experience does help individual day traders in the Taiwan futures market improve their performance in day trading. Even though less-sophisticated, individual investors receive negative returns from their day trading, their performance in day trading improves when they become sophisticated financial traders.

The influence of trading experience on the profitability of day trading is statistically insignificant for aggregate institutional investors. This result may be due to the professional nature of institutional investors and the short time span over which the experience variables are calculated. Institutional investors are typically regarded a strained professionals with resources and specialized knowledge from comprehensive research over various investment opportunities. The investment expertise that all institutional investors already possess may not easily be quantified and measured by the experience proxies calculated over the sub-sample period in this study. In addition, the results of this study suggest that day trading may improve the trading performance of local institutional investors. However, a high proportion of day trading on a short position tends to reduce the profits that foreign and local institutional investors make over the sample period.

The results of this study also suggest that, for all types of day traders, their net profits from day trading are not obviously correlated with their trading performance in previous periods. The results are compatible with some researchers' views on the overconfident behavior of investors.

By utilizing a microstructure dataset for Taiwan's futures market to identify the record of trading for each trader, this study examines the profitability of high frequency day trading. This study shows evidence supporting the notion that the characteristics of traders have influence on the performance of traders. Under data availability constraints, the results of this study still echo those reported in other studies that cover more general period other than the sample period covered in this study. Those other studies include the research by Barber et al. (2012) on Taiwanese equity market, Seru, Shurmway and Stoffman (2009) on Finnish equity market, Nicolosi, Peng and Zhu (2009) on US equity market, and Choe and Eom (2009) on Korean futures market, of which the sample periods end before the occurrence of the 2007-08 financial crisis. Those other studies also include the works by von Beschwitz and Massa (2019) on US equity market, and Vaarmets, Liivamägi, and Talpsepp (2019) on Tallinn equity market, of which the sample period cover the crisis period, and the works by Tekçe and Yilmaz (2015) and Tekçe,Yilmaz and Biddik (2016) on Turkish equity market, over the time period during which the crisis has been resolved. In those other studies, trader characteristics are found to have explanatory power on trader earning, even though the traits successful traders exhibit might differ. Therefore, this study provides useful information about the traits profitable day traders need to possess to improve their day trading performance.

5. Conclusion

This study examines the day trading activities conducted by different types of investors in the Taiwan futures market. Whether and how trading experience, trader sophistication, and trading strategies influence the returns from day trading is examined herein. In this study the calculation of net profits takes into account the transaction costs incurred during trading executions.

The results of this study show that the characteristics of traders affect the profitability of day trading differently for various types of traders. Day trading is hazardous to the wealth of individual investors. However, more experienced, financially sophisticated, individual day traders may achieve better trading performance, and undertaking day trading may improve the trading performance of local institutional investors. Nevertheless, a day trading strategy based on short-selling activities may reduce the returns on investment for foreign and local institutional investors. In addition, trading experience does not exert a statistically significant influence on the performances of aggregate institutional investors' day trading. The insignificant results may arise due to the professional nature of the operations of institutional investors and the short time horizon over which experience is measured in this study.

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