Do Individual Day Traders Make Money? Evidence from Taiwan

Brad M. Barber
Graduate School of Management
University of California, Davis
Davis, CA 95616
(530) 752-0512
bmbarber@ucdavis.edu
www.gsm.ucdavis.edu/~bmbarber

Yi-Tsung Lee
Department of Accounting
National Chengchi University
Taipei, Taiwan
(886-2) 2939-3091 # 81027
actytl@nccu.edu.tw

Yu-Jane Liu
Department of Finance
National Chengchi University
Taipei, Taiwan
(886-2) 2939-3091 # 81123
finyjl@nccu.edu.tw

Terrance Odean[*]
Haas School of Business
University of California, Berkeley
Berkeley, CA 94720
(510) 642-6767
odean@haas.berkeley.edu
faculty.haas.berkeley.edu/odean

May 2004

[*] We are grateful to the Taiwan Stock Exchange for providing the data used in this study. Michael Bowers provided excellent computing support. Barber appreciates the National Science Council of Taiwan for underwriting a visit to Taipei, where Timothy Lin (Yuanta Core Pacific Securities) and Keh Hsiao Lin (Taiwan Securities) organized excellent overviews of their trading operations.

Do Individual Day Traders Make Money? Evidence from Taiwan

Abstract

When an investor buys and sells the same stock on the same day, he has made a day trade. We analyze the performance of day traders in Taiwan. Day trading by individual investors is prevalent in Taiwan – accounting for over 20 percent of total volume from 1995 through 1999. Individual investors account for over 97 percent of all day trading activity. Day trading is extremely concentrated. About one percent of individual investors account for half of day trading and one fourth of total trading by individual investors. Heavy day traders earn gross profits, but their profits are not sufficient to cover transaction costs. Moreover, in the typical six month period, more than eight out of ten day traders lose money. Despite these bleak findings, there is strong evidence of persistent ability for a relatively small group of day traders. Traders with strong past performance continue to earn strong returns. The stocks they buy outperform those they sell by 62 basis points *per day*. This spread is sufficiently large to cover transaction costs.

When an investor buys and sells the same stock on the same day, he has made a day trade. At the end of the last millennium and a long bull market in U.S. equities, day trading grew in popularity. In 1999, The Electronic Trade Association estimated that 4,000 to 5,000 people traded full time through day trading brokerages[1] and accounted for nearly 15 percent of daily volume on NASDAQ.[2] By most accounts, the poor returns on U.S. stocks from 2000 to 2002 squelched day trading. However, as the U.S. market earned strong returns in 2003, day trading made a comeback.[3]

In September 1999, the Senate Permanent Subcommittee on Investigations held the first congressional hearing on day trading. In July 2000, the subcommittee issued its final report. The report concluded that (p.2) "a growing number of people are giving up their existing careers or withdrawing their savings to become full-time professional day traders." Concurrent investigations were launched by the SEC, NASD, NYSE, and several state regulatory bodies. All of these investigations expressed concerns about the potentially deceptive advertising practices employed by day trading firms. As a result of these investigations, the NYSE and NASD adopted rules in September 2001 that required day trading firms to make a determination that day trading is appropriate for a particular customer.

Do day traders make money? This was a central question in the investigations described above. Unfortunately, to date, there is no comprehensive empirical evidence available to answer this question. Though the investigations contained some analyses of the profitability of day trading, these analyses were largely limited to a handful of accounts. For example, the North American Securities Administrators Association sponsored a widely cited study of the profitability of 26 day traders at All-Tech brokerage, a brokerage that catered to day traders and was a target of the Senate

---

[1] Randy Whitestone and Phil Serafino, *Day Traders' Invasion,* BLOOMBERG, May 1999, at 36, 39.
[2] Britt Tunick, *Day Traders Working Hard to Influence How the Profession is to be Defined*, SEC. WEEK, May 24, 1999.
[3] John Hechinger and Jeff Opdyke, *Day Trading Makes a Comeback and Brokers Vie for the Business*, Wall Street Journal, September 30,2003, p.A1. Matt Krantz, *Day Traders Make a Comeback*, USA Today, July 28, 2003.

investigations. Drawing conclusive inferences from such a small sample of accounts from a brokerage firm under investigation is difficult.

Unlike the studies cited in congressional and SEC investigations, two small scale academic studies of day trading provide evidence that day trading can be profitable. Harris and Schultz (1998) analyze the day trading of Small Order Execution System (SOES) bandits using trading records from two brokers. To do so, they analyze roughly 20,000 trades over a three week period. Though the SOES traders lose money almost as frequently as they make money, they earn a small average profit per trade. Similarly, Garvey and Murphy (2001) analyze the trading of 96,000 trades made by fifteen proprietary day traders—traders who use a firm's capital, pay no commissions, and profit share with the firm—at a direct access broker during three months in 2000. They too find these fifteen day traders are able to make money on their day trading activities primarily by placing limit orders on electronic crossing networks (ECNs) that are inside the current best quotes offered by NASDAQ dealers. Seasholes and Wu (2004) examine the trades of ten extremely active traders on the Shanghai Stock Exchange. These traders earn substantial profits through buying shares on days that stocks hit their upper price limits and quickly selling those shares the following day.

Linnainmaa (2003) analyzes 7,686 investors who complete at least one roundtrip intraday transaction. These investors are far less active than those studied by Harris and Schultz (1998) and Garvey and Murphy (2001). The majority of these investors day trade on only one or two occasions and, in aggregate, these investors complete only 185,000 day trades over a two and a half year period (November 1998 through May 2000). Linnainmaa reports that the net returns of these investors are lower than those of a control sample.

In contrast to these smaller scale studies of day trading, we provide a comprehensive analysis of the profitability of all day trading in Taiwan over a five year period. During an average six month period, we identify over 130,000 investors who transact at least $NT 1.5 million in day trades and over 9,000 who transact at least $NT

90 million in day trades.[4] To do so, we use a unique and remarkably complete dataset, which contains the entire transaction data, underlying order data, and the identity of each trader on the Taiwan Stock Exchange (TSE) – the World's twelfth largest financial market. With these data, we provide a comprehensive accounting of the profitability of day traders during the period 1995 through 1999.

Taiwan provides a particularly appropriate setting to analyze the profitability of day trading. By most accounts, day trading has been a fixture on the TSE for decades. Consistent with these assertions, day trading accounts for over 20 percent of trading volume in Taiwan during our 1995 to 1999 sample period (see Figure 1). Virtually all day trading (97.5 percent) can be traced to individual investors in Taiwan. In the typical month, 15 percent of individual investors who trade on the TSE engage in at least one day trade.

To analyze the profits earned by day traders, we follow a simple two-step procedure. First, we identify day traders. Second, we analyze the profits earned on all subsequent trades made by investors identified as day traders.

We define day trading as the purchase and sale of the same stock on the same day by an investor. Using this definition, we classify investors who made at least $NT 90 million of day trades during a six-month period as heavy day traders. In the average month, about 900,000 individual investors trade on the TSE. Of these investors, about one percent are classified as heavy day traders. These heavy day traders account for over half of all individual day trading activity and one fourth of individual trading volume.

We then analyze the profitability of trades made by these investors in the month following their identification as heavy day traders. In aggregate, these heavy day traders earn mean daily gross profits (before transaction costs) of $NT 36.4 million, but daily net losses (after a reasonable accounting for transaction costs) of $NT 68.9 million. Both the

---

[4] The average exchange rate that prevailed during our sample period was approximately $NT 30 per $US 1. Thus $NT 90,000,000 is approximately $US 3,000,000.

gross profits and net losses of these day traders are reliably different from zero. In other words, day traders are able to execute trades at favorable prices, though not sufficiently favorable to cover reasonable transaction costs.

Do heavy day traders perform better than occasional day traders? To address this question, we split day traders into categories based on their past levels of day trading activity. This analysis indicates heavy day traders perform better than occasional day traders, though neither group is able to earn sufficient profits to cover transaction costs.

Do day traders with past profits subsequently outperform those with past losses? To address this question, we split day traders into categories based on their trading profits during the past six months. The analysis reveals a clean monotonic relation between past trading profits and subsequent returns. Day traders who historically earned net profits continue to earn profits net of a reasonable accounting for transaction costs.

Do day traders demand or supply liquidity? To address this question, we classify trades as passive, aggressive, or indeterminate. We find that 2/3rds of trades placed by day traders are aggressive while only ¼ are passive. Nearly 3/4th of the trades placed by heavy day traders are aggressive, while only 1/6th are passive. In contrast, Linnainmaa (2003) reports that slightly over half of trades placed by 7,686 Finnish day traders are liquidity supplying.

Our main empirical findings can be summarized succinctly. Heavy day traders appear to trade at favorable prices, but only a select few are sufficiently savvy to consistently earn profits net of their trading costs. More than eight out of ten day traders lose money in a typical semiannual period.

The remainder of this paper is organized as follows. We discuss Taiwan market rules, our dataset, and methods in Section I. We present results in Section II, followed by a discussion and concluding remarks.

I. Background, Data, and Methods

I.A. Taiwan Market Rules

Before proceeding, it is useful to describe the Taiwan Stock Exchange (TSE). The TSE operates in a consolidated limit order book environment where only limit orders are accepted. During the regular trading session, from 9:00 a.m. to noon during our sample period, buy and sell orders can interact to determine the executed price subject to applicable automatching rules.[5] Minimum tick sizes are set by the TSE and vary depending on the price of the security. Effective November 2, 1993, all securities listed on the TSE are traded by automatching through TSE's Fully Automated Securities Trading ("FAST") system. During our sample period, trades can be matched one to two times every 90 seconds throughout the trading day. Orders are executed in strict price and time priority. An order entered into the system at an earlier time must be executed in full before an order at the same price entered at a later time is executed. Although market orders are not permitted, traders can submit aggressive price-limit order to obtain matching priority. During our study period, there is a daily price limit of seven percent in each direction and a trade-by-trade intraday price limit of two ticks from the previous trade price.

Since our analysis focuses on day trading, an important consideration is transaction costs. The TSE caps commissions at 0.1425 percent of the value of a trade. Some brokers offer lower commissions for larger traders – an issue that we discuss in greater detail later in the paper. Officials at brokerage firms and the TSE indicated to us that the largest commission discounts offered are 50 percent (i.e., a commission of roughly 7 basis points); these same officials estimated the trade-weighted commission paid by market participants to be about 10 basis points. Taiwan also imposes a transaction tax on stock sales of 0.3 percent.

[5] Trading also occurred on Saturdays during most of our sample period. Before December 1997, Saturday trading occurred from 9:00-11:00. From January to March, 1998, stocks were traded only on the second and the fourth Saturday in each month. From April 1998 to Decebmber 2000, Saturday trading occurred from 9 am to noon. From 2001 on, there has been no trading on Saturday.

I.B. *Trades Data and Descriptive Statistics*

We have acquired the complete transaction history of all traders on the TSE from January 1, 1995, through December 31, 1999. The trade data include the date and time of the transaction, a stock identifier, order type (buy or sell -- cash or margin), transaction price, number of shares, a broker code, and the identity of the trader. The trader code allows us to broadly categorize traders as individuals, corporations, dealers, foreign investors, and mutual funds. The majority of investors (by value and number) are individual investors. Corporations include Taiwan corporations and government-owned firms (e.g., in December 2000 the government-owned Post, Banking, and Insurance Services held over $NT213 billion in Taiwanese stock). Dealers include Taiwanese financial institutions such as Fubon Securities, Pacific Securities, and Grand Cathay Securities. Foreign investors are primarily foreign banks, insurance companies, securities firms, and mutual funds. During our sample period, the largest foreign investors are Fidelity Investments, Scudder Kemper, and Schroder Investment Management. Mutual funds are domestic mutual funds, the largest being ABN-AMRO Asset Management with $NT82 billion invested in Taiwanese stocks in December 2000.

We define day trading as the purchase and sale, in any order, of the same stock on the same day by an investor. Specifically, if an investor buys and sells the same stock on the same day, we calculate the number of shares bought (S_b), the number of shares sold (S_s), the average buy price (P_b), and the average sales price (P_s). The value of day trading is defined as $P_b*\min(S_b,S_s)+P_s*\min(S_b,S_s)$. Over our sample period, day trading accounted for more than 20 percent of the total dollar value of trading volume. Most day trading (64 percent) involves the purchase and sale of the same number of shares in a stock over the course of one day (i.e., most day trades yield no net change in ownership at the close of the day).

In table 1, we present descriptive statistics on overall trading activity and day trading by investor categories. On the average day, the total value of buys and sells is $NT 170 billion. Individual investors account for almost 90 percent of this trading activity. Individual investors account for an even larger fraction of day trading (97 percent). While day trading accounts for 22 percent of total individual trading activity, day trading accounts for only five percent of institutional trading. Among institutions, corporations are the most active day traders (both by the value of day trading and the proportion of trading activity attributable to day trading).

Individuals and corporations are free to short sell, though dealers, mutual funds, and foreigners are prohibited from doing so on the TSE. These short sale restrictions might partially explain the tendency for day trading to concentrate among individual investors and corporations. In contrast to U.S. markets, dealers are not active providers of liquidity. Though dealers are required to "efficiently adjust the demand and supply in the market depending on the market situation, and ensure that the formation of fair price and its sound operation are not harmed," dealers face no specific penalties for failing to meet this requirement. Dealer trades emanate from their proprietary trading activity. Based on our discussions with dealers in the TSE, the majority of this proprietary trading is not necessarily intended to provide liquidity. Chae and Wang (2003) also report that TSE dealers are not net providers of liquidity.

I.C. Identification of Day Traders

To analyze the performance of day traders, we follow a simple two step procedure. First, we identify day traders based on the history of their trading activity. Second, we aggregate the trades made by this investor group in a subsequent period and analyze the performance of the aggregated trades. It is important to note that period used to identify day traders *always* precedes the period used to evaluate their performance. This simple rule precludes the possibility that our results are being driven by any endogeneity that may exist between contemporaneous performance and day trading (e.g., good performance may cause investors to increase their day trading activity). In section II.E. and Table 7, we document that day trading activity and profitability is indeed endogenous; day traders with past profits increase their day trading activity significantly more than day traders with past losses.

We focus on individual day traders, since they account for the vast majority of day trading in Taiwan. We partition individual day traders in two ways – based on their past day trading activity and their past trading profits. Consider first the partition on past day trading activity. In month *t*, we sum the total value of day trading (*DT*) in months *t-6* to *t-1*. We then partition investors into seven mutually exclusive categories based on their past trading activity:

1. \$NT 600 million ≤ DT
2. \$NT 240 million ≤ DT < \$NT 600 million
3. \$NT 90 million ≤ DT < \$NT 240 million
4. \$NT 15 million ≤ DT < \$NT 90 million
5. \$NT 1.5 million ≤ DT < \$NT 15 million
6. \$NT 0.3 million ≤ DT < \$NT 1.5 million
7. DT < \$NT 0.3 million

Using these partitions, we analyze the trading and performance of each group in month *t*, where category assignments are updated monthly. Note that this categorization is exhaustive. Investors who rarely or never day trade fall into our seventh category (*DT* < \$NT 300,000).

In table 2, panel A, we present descriptive statistics on the overall trading activity and day trading for each of these partitions. The partitions are based on day trading in months *t-6* to *t-1*, while the descriptive statistics in the table describe trades made by each group in month *t*. Our simple identification procedure does a good job of identifying heavy day traders. Investors who fall into our top day trading group continue to trade heavily (the average value of their daily trades exceeds \$NT 13 million) and over half of their trades are day trades. In combination, the top three trading groups represent about one percent of investors who trade in the average month (9,389 out of 925,841) account for roughly half of all day trading. Overall trading (i.e., day trades and non-day trades) by this one percent of investors accounts for one fourth of total trading volume by all individual investors. In contrast, investors with little or no past day trading activity represent 78 percent of investors who trade in the average month, account for 25 percent of overall trading volume, but only account for five percent of day trading activity.

Consider second the partition which is based on on past trading profits. In month t, we calculate the mean standardized trading profits, net of transaction costs, during months *t-6* to *t-1* as follows. We do not observe transaction costs directly, so we assume that investors face a one-way commission of 7 basis points (roughly half the maximum commission rate of 14.25 basis points). Our discussions with officials at the TSE indicate that heavy traders might receive a discount of up to 50 percent on the maximum commission level. In addition, these officials estimated the average commission faced by investors on the TSE was 10 basis points. Thus, our assumption of a commission of 7 basis points is likely to underestimate true costs; we assume a higher 10 basis points when evaluating the performance of subsequent trades. Sales are taxed at 30 basis points. Thus, for each investor, for days on which the investor trades, we calculate net daily profits on day τ (π_τ) as:

$$\pi_\tau = \sum S_b(P_c \quad P_b) \quad S_s\left(P_c \quad P_s\right) \quad .0007(S_bP_b \quad S_sP_s) \quad .003(S_sP_s),$$

where S_b and S_s are the total number of shares bought and sold, P_b and P_s are the average purchase price and the average sale price, and P_c is the closing price of the stock on day τ. The summation is across all stocks traded (regardless of whether the trade was part of a day trade) on day τ by a particular investor. This calculation yields a time series of daily intraday trading profits for each trader over the six months spanning *t-6* to *t-1*. We calculate the mean standardized profit as the mean daily profit divided by the standard deviation of daily profits: $\bar{\pi} / \sigma(\pi)$. To rank an investor in month t, we require at least 35 observations (days) of daily profits in months *t-6* to *t-1*.[6] We partition investors into seven mutually exclusive categories based on their past trading profits:

1. $0.2 < \bar{\pi} / \sigma(\pi)$
2. $0.1 < \bar{\pi} / \sigma(\pi) \leq 0.2$
3. $0 < \bar{\pi} / \sigma(\pi) \leq 0.1$
4. $-0.2 < \bar{\pi} / \sigma(\pi) \leq 0$
5. $-0.4 < \bar{\pi} / \sigma(\pi) \leq -0.2$
6. $\bar{\pi} / \sigma(\pi) \leq -0.4$

[6] To ensure that this analysis yields predominantly day traders, we also throw out any investor that did not engage in at least three day trades in month *t-1*.

Using these partitions, we analyze the trading and performance of day traders in month *t*, where category assignments are updated monthly.

In table 2, panel B, we present descriptive statistics on the overall trading activity and day trading by for each of these profit partitions. Individual investors with no ranking (i.e., less than 35 observations of day trading profits in the prior six months) account for 59 percent of total trading volume and 31 percent of day trading activity. Day trades account for 12 percent of total trading for the unranked investors. In contrast, a high proportion of trades by ranked investors are day trades – ranging from 32 percent to 53 percent.

I.D. Performance Measurement

Since we focus on day traders, we measure performance from the transaction time to the close of trading on the same day. (Our results are qualitatively similar using longer evaluation periods of up to ten days.) On each day for each stock, we sum shares bought and shares sold by a particular investor group. For example, to analyze the performance of heavy day traders, on each day we calculate their gross dollar profits as:

$$\pi_\tau^{\text{gross}} = \sum S_b(P_c - P_b) - S_s\left(P_c - P_s\right).$$

In contrast to our previous calculations for ranking purposes, which are done at the investor level, the shares bought, share sold, average purchase price, and average sales price are derived from all transactions made by investors within a particular group (i.e., at the group level). The summation is across all stocks traded by a group on day τ. This calculation yields a time series of daily gross dollar profits for the group. Statistical significance is based on the time series mean and standard deviation of daily dollar profits.

We supplement this analysis with a calculation of gross returns. We calculate the difference between the returns on stocks bought by a particular group and the returns on stocks sold (R_τ) as:

$$R_\tau = \frac{\sum S_b P_c}{\sum S_b P_b} - \frac{\sum S_s P_c}{\sum S_s P_s}.$$

Again, summations are across all stocks traded on day τ. Thus, to calculate the returns to stocks bought, we compare the total value of buys to the closing value of positions bought. This calculate yields a time series of daily returns. Statistical significance is based on the time series mean and standard deviation of daily returns.

Finally, we calculate the net daily profits earned by a particular group by subtracting commissions (assumed to be 10 basis points) and transaction taxes (30 basis points on sales) from the daily gross profits as:

$$\pi_\tau = \sum S_b(P_c \quad P_b) \quad S_s\left(P_c \quad P_s\right) \quad .001(S_bP_b \quad S_sP_s) \quad .003(S_sP_s)\,.$$

The summation is across all stocks traded by a particular group on day τ. Statistical significance is based on the time-series mean and standard deviation of the daily net dollar profits.

II. Results

II.A. Performance before Costs

In table 3, we present the gross performance (before transaction costs) for investors partitioned on the basis of their past day trading volume (panel A) and the past profitability of their trading (panel B). Panel A reveals that heavy day traders have strong gross performance, while less active day traders have negative gross returns and suffer losses even before considering costs associated with their trading.

Consider the day traders in our top three groups. (i.e., traders who day traded a minimum of $NT 90 million in the prior six months). Note that a minimum of $NT 90 million in day trades over a six month period implies mean day trading activity of almost $NT 650,000 (slightly more than $US 20,000 per day). When combined, 43 percent of the total trading activity by these groups can be traced to their day trading (see table 2, panel A). In combination, these groups earn gross profits of $NT 36.4 million (see table 3, panel A).

Our main results compare transaction prices to closing prices on the same day. A natural question that this approach raises is whether the results differ if we evaluate trade performance over longer periods. To address this question, we track the performance of stocks bought and stock sold by a particular group for up to ten days following the transactions.[7] The gross profits earned by our heavy day trading groups do not change when we consider evaluation periods up to ten days. For example, the top trading group earns mean daily gross profits of $NT 21.4 million when we compare transaction prices to closing prices on the same day (table 3, panel A); at a horizon of ten days, the mean daily gross profit of this groups is $NT 23.5 million. When combined, the profits of the top three trading groups change little at holding periods up to ten days (from $NT 36.4 million to $NT 34.7 million at an assumed holding period of ten days). These results are not surprising, since a significant fraction of trades by these trading groups are day trades and thus would not contribute profits (or losses) after the trade date. In contrast, the losses of less active traders grow as we consider longer holding periods. For example, the losses of the least active trading group – many of whom engage in no day trading – grow from $NT 24.3 million over a single day to $NT 32.1 million over a ten day horizon.

Analyzing these same data, Barber, Lee, Liu, and Odean (2003) document that, in aggregate, the trades of all individual investors lose money before accounting for transaction costs and that these losses grow at longer horizons. Thus the trades of both less active day traders and individual investors in aggregate lose money, while the trades of heavy day traders earn gross profits.

In panel B, table 3, we analyze day traders partitioned on the basis of past profitability. There is a monotonic relation between past profitability and subsequent returns; the most profitable traders continue to earn superior returns, while the least profitable traders continue to suffer losses. By construction (since we require a minimum of 35 days to rank an investors on the basis of their past profitability), each of our profit partitions consists of relatively active day traders (see table 2). Thus, not surprisingly, the mean gross daily profits of each group do not change significantly when we evaluate their trades over longer horizons. .

[7] We employ methods identical to those outlined in detail in Barber, Lee, Liu, and Odean (2003).

II.B. Performance after Trading Costs

In table 4, we present results net of trading costs (10 basis points for commissions and 30 basis points for the tax on sales). Panel A reveals that the strong gross performance of heavy day traders does not translate into profits net of transaction costs. In the last two columns of the table, we present the mean number of accounts contributing trades to our analysis and the average profit (or loss) per account. Net of fees, the average account in the heavy day trader partition (greater than $NT 600 million in day trading activity over the prior six months) incurs daily losses of $NT 8,443. Accounts with little or no prior day trading activity incur much smaller daily losses, largely because they trade less actively.

In contrast, panel B reveals that day traders with the most profitable past trading activity continue to earn profits net of costs. The net profits of the top two partitions are reliably positive. Though, on average, only 393 accounts contribute trades to the top profit partition, these accounts earn average daily profits of $NT 7,532. Given 280 trading days in the average year, this translates into an annual income of $NT 2.1 million. The mean annual income in Taiwan in 1999 was $NT 390,000 and, according to the directorate-general of budget, accounting, and statistics in Taiwan, the mean annual salary for employees of financial institutions (including banks, securities firms, and real estate agencies) is around $NT 800,000. Thus, an investor who mimicked the trades of our top profit partition would earn an annual income that is well above average.

The fact that we are able to identify a persistently strong group of day traders indicates that day trading is not entirely a fool's game. Some day traders are able to make money net of transaction costs. Coval, Hirshleifer, and Shumway (2003) document persistence in the gross performance of purchases made by successful investors at a large U.S. discount brokerage firm. Their sample consists of individual investors, the majority of whom are not day traders. In contrast to our findings, the profits they are able to document for successful investors are not sufficient to cover typical trading costs.

II.C. Results by Order Type

There is convincing evidence that many day traders earn gross profits, though only a select few are sufficiently savvy to earn profits net of transaction costs. To gain further insight into the behavior of day traders, we analyze the orders underlying their trades. On one hand, day traders may provide liquidity to market participants by placing passive limit orders that provide depth to an otherwise thin market. This strategy would be profitable as long as uninformed traders are willing to pay for this liquidity and the providers of liquidity are able to avoid excessive trading with investors who possess superior information. On the other hand, day traders could earn gross profits by placing aggressive orders in anticipation of future price movements. This strategy would be profitable if day traders possessed superior information (or superior ability to process publicly available information) or were able to otherwise identify short-term trends in prices.

To determine whether day traders are earning gross profits by providing liquidity or spotting short-term trends in prices, we analyze orders underlying their trades. In addition to trade data, we have all orders (both filled and unfilled) that underlie these trades. Using these order data, we categorize each trade as aggressive or passive based on the order underlying the trade. This categorization involves three steps. First, for each stock, we construct a time series of clearing prices, the lowest unfilled sell limit order price, and the highest unfilled buy limit order price. These data are compiled by the TSE (the market display data) and are presented to market participants in real time. Second, we categorize all orders as aggressive or passive by comparing order prices to the most recent unfilled limit order prices. Orders to buy with prices in at, or in excess, of the most recent unfilled sell limit order are categorized as aggressive; those with prices at, or below, the most recent unfilled buy limit order are categorized as passive; those with an order price between the two unfilled limit order prices are categorized as indeterminate. There is an analogous algorithm for sells. Third, we match all orders to trades. This matching allows us to determine whether a trade emanated from a passive or aggressive order. Using this algorithm, we are able to categorize 90 percent of all trades as passive or aggressive.[8]

In table 5, we partition the trades for all individual investors and for each of our partitions into trades emanating from passive, aggressive, or indeterminate trades. Overall, 65 percent of individual trades can be traced to aggressive limit orders. Even if investors placed similar numbers of aggressive and passive limit orders, we would expect a higher percent of trades to originate from aggressive limit orders, since aggressive limit orders are more likely to execute.

In Table 5, Panel A, we examine the trading of individual investors partitioned on the basis of their past day trading activity. A relatively high proportion of trades made by heavy day traders can be traced to aggressive orders. For heavy day traders, 74 percent of trades[9] can be traced to aggressive orders; in contrast, for individual investors who engage in limited (or no) day trading, only 56 percent of trades can be traced to aggressive orders. Moreover, there is a monotonic relation between the proportion of trades emanating from aggressive orders and past day trading activity.

In Panel B, we examine the trading of individual investors partitioned on the basis of their past trading profits. In contrast to the results based on past day trading activity, there is no obvious relation between past trading profits and the proportion of trades emanating from aggressive orders.

These results indicate that the gross profits earned by heavy day traders come predominantly from the execution of aggressive limit orders (see also footnote 10). Based on this analysis, we conclude that heavy day traders are not profiting primarily

---

[8] The indeterminate category also includes trades that we are unable to match to an order. We discussed this issue with the TSE and they suspect data entry errors in the order records is the source of the problem. Though annoying, this type of data error should not introduce any bias into our results.

[9] In auxiliary analyses, we calculate the proportion of gross trading profits (from Table 3) that can be attributed to passive, aggressive, and indeterminate orders. A high proportion (83 percent) of the gross profits earned by the heaviest day traders can be traced to aggressive limit orders.

from the provision of liquidity. Instead, heavy day traders are able to forecast short-term trends in prices.

II.D. The Cross-Section of Performance

Our analyses to this point have focused on trades aggregated across investors. To gain further insight into the cross-sectional variation in performance, we measure performance at the investor level and analyze the cross-section of performance within particular groups of investors. As before, we partition investors in two ways: on the basis of their day trading activity in the past six months and their standardized profits in the past six months. We then calculate the total intraday trading profits earned by each investor over the subsequent six month by first calculating daily profits as:

$$\pi_\tau = \sum S_b(P_c \quad P_b) \quad S_s\left(P_c \quad P_s\right) \quad .0007(S_bP_b \quad S_sP_s) \quad .003(S_sP_s),$$

where S_b and S_s are the total number of shares bought and sold, P_b and P_s are the average purchase price and the average sale price, and P_c is the closing price of the stock on day τ. The total intraday trading profits for each investor over the six month evaluation period are calculated as the sum of daily profits over the period for days on which the investor day trades. Since our sample period spans five years, this analysis yields nine six month evaluation periods.

For each subgroup, we calculate the proportion of investors who earn net profits, the mean profit across investors, and the median profit level for the group. The results of this analysis are presented in table 6. In panel A, we present results for investors partitioned on the basis of their past day trading activity. Consistent with our prior findings, the mean (and median) profit for each group is reliably negative. Also consistent with our prior evidence, less than half of traders within each group earn positive profits, though a higher proportion (39 percent) of the heavy day traders earn positive profits.

If we define a day trader as an investor who placed a minimum of $NT 300,000 day trades in the prior six months (i.e., all investors in Table 6), only 18 percent earn profits from their trading activities in the subsequent six month period. This is obviously a loose definition of day trader and captures many very occasional day traders. Nonetheless, using a tighter definition – investors who placed a minimum of $NT 90 million day trades in the prior six months, only 19 percent earn profits from their trading activities in the subsequent six month period. In summary, even using a low commission assumption of 7 basis points, more than eight of ten day traders lose money in they typical semiannual period.

In panel B, we present results for investors partitioned on the basis of their past standardized profits. Consistent with our prior evidence, there is a strong monotonic relation between past standardized profits and subsequent performance. Almost two-thirds of the top performing group continues to earn profits net of transaction costs. The mean semi-annual income for this group is over $NT 1 million, though the median profit is a more modest $NT 125,761. The second performance group also earns positive mean returns, though less than half of these investors earn positive profits and the median profit is not reliably different from zero. The mean (and median) investor in the remaining groups suffers losses. In the lowest past performance group, a remarkably high proportion (97 percent) of investors loses money.

II.E. Does Performance Influence Subsequent Day Trading

Our results to this point indicate a large fraction of day traders, more than eight out of ten, lose money, though a small fraction of day traders earn large persistent profits. An obvious question that arises is whether day traders with poor performance reduce their day trading activities. In this section, we provide evidence that day traders with poor performance curtail their day trading activity.

To analyze this question, we partition investors first on the basis of their day trading activity in the prior six months. We partition first on the basis of past day trading activity because there is mean reversion in day trading activity – heavy day traders reduce their day trading activity, while light day traders increase their day trading activity. By first partitioning on past day trading activity, we provide a control (albeit crude) for this tendency for mean reversion. Within each day trading partition, we further partition investors on the basis of their standardized profits during the six month period. In contrast to our prior analyses that use standardized profits, we do not require 35 days of trading profits to rank an investor. Our results are qualitatively similar if we impose this restriction.

To analyze the effect of performance on day trading activity, we calculate the percentage change in the dollar value of day trading activity for each investor from the six month ranking period to the subsequent six month period. We then calculate the mean percentage change in account level day trading activity for each group of investors. To supplement this analysis, we also calculate the aggregate percentage change in day trading activity for the entire group. The results of this analysis are presented in Table 7.

There is a strong relation between performance and subsequent day trading activity. Within each day trader partition, the average investor in the top performing group increases his day trading activity, while the average investor in the bottom performing group decreases his day trading activity. For example, among investors with a minimum of $NT 90 million in day trades during the six month ranking period, the average investor in the top performance group increases his day trading by 19.4 percent, while the average investors in the bottom performance group decreases his trading by one third. A similar pattern emerges in panels B through D. In all cases, the mean percentage change in the day trading activity of the top performance group is reliably greater than the mean percentage change in the day trading activity of the bottom performance group ($p<0.01$).

III. Discussion

Most day traders, especially heavy day traders, lose money trading. Why do investors engage in such a wealth reducing activity? One possibility is that investors simply find day trading entertaining. Undoubtedly some investors do find day trading entertaining, but can entertainment account for the extent of day trading that we observe? Day traders with a minimum of $NT 90 million in our six month ranking period incur average daily losses of $NT 7,338 during the subsequent month. On an annual basis this is equivalent to slightly more than $NT 2 million, over five times the average annual wage in Taiwan and two and a half times the mean annual salary for employees of financial institutions. Do day traders knowingly and willingly accept such large expected losses for fun? For all but the wealthiest investors, this would be a very expensive form of entertainment indeed.

Another reason why day trading might entice investors would be if it provided an appealing distribution of returns. People often display an attraction to highly skewed investments, such as lotteries, that have negative expected returns but a small probability of a large payoff. However, the day trading profits that we document are similar in magnitude to, and far less prevalent than, losses. Unlike lottery winners, day traders must succeed on repeated gambles in order to achieve overall success. Such repeated gambles do not tend to generate highly skewed distributions.

A final potential explanation for the prevalence of day trading is that most day traders are overconfident about their own chances of success. Several papers (e.g., Odean (1998, 1999), Barber and Odean (2000, 2001)) argue that overconfidence causes investors to trade more than is in their own best interest. Overconfident day traders may simply be bearing losses that they did not anticipate. While day traders undoubtedly realize that other day traders lose money, stories of successful day traders may circulate in non-representative proportions, thus giving the impression that success is more frequent that it is. Heavy day traders, who earn gross profits but net losses, may not fully consider trading costs when assessing their own ability. And, individual day traders may believe themselves more likely to succeed than the average day trader. We are unable to explicitly test whether day traders are motivated by overconfidence rather than the desire for entertainment. Our opinion is that the average losses incurred by day traders are more than most would willingly accept as the cost of entertainment and that, by and large, day traders must hold unrealistic beliefs about their chances of success.

We find that the trades of heavy day traders are profitable before deducting transactions costs and that the trades of previously successful traders are profitable even after accounting for costs. How do day traders identify profitable trades and who is on the other side of these trades? The likely counterparties to profitable trades by heavy and previously successful day traders are less active day traders and individual investors in general. As documented in Section II.A and in Barber, Lee, Liu, and Odean (2003) the trades of these groups result in losses even before deducting transaction costs. One way in which day traders could be earning profits is by supplying liquidity through passive limit orders to uninformed investors who are too eager to pay for quick execution. While some day traders may focus on supplying liquidity, over 70 percent of the trades executed by heavy and previously successful day traders are aggressive limit orders; a similar proportion of their profits can also be traced to aggressive orders. Such orders will lead to day trading profits when traders are able to anticipate short term price changes. Harris and Shultz (1998) document that SOES bandits are able to profit from trading with market-makers who are ostensibly better informed and better financed. Harris and Shultz write that SOES bandits appear to profit by paying close attention to the market and reacting more quickly than most market-makers to changing market conditions. The day traders studied by Garvey and Ryan (2001) also appear to profit from reacting to market changes more quickly than most market makers. We speculate that the successful day traders who we observe profit by reacting more quickly than other investors to changing market conditions just as SOES bandits and the fifteen day traders studied by Garvey and Murphy profit from quick reactions.

IV. Conclusion

We analyze day traders in Taiwan. Day trading is prevalent in Taiwan – accounting for more than 20 percent of total trading volume during our sample period. Individual investors account for virtually all day trading (over 97 percent). Day trading is heavily concentrated. About one percent of individual investors account for half of day trading and one fourth of total individual investor trading volume.

Our analysis of performance indicates day trading is treacherous, but not entirely a fool's game. Heavy day traders, as a group, earn gross profits (before transaction costs). Thus, heavy day traders do appear to have a trading advantage over other investors. The stocks bought by the most active day traders outperform those sold by 31 basis points *per* *day*. Unfortunately, the gross profits of heavy day traders are not sufficiently large to cover reasonable estimates of transaction costs. Thus, as a group, they lose money. In contrast, occasional day traders experience both gross and net losses. The stocks bought by occasional day traders actually underperform those sold, even before considering transaction costs.

There is considerable cross-sectional variation in the performance of day traders. Over the typical six month horizon, using lower range assumptions regarding transaction costs, less than 20 percent of day traders earn profits net of transaction costs.

These results paint a rather dim portrait of day traders. However, we do document a select few are able to consistently earn profits sufficient to cover transaction costs. We identify day traders who earn substantial profits over a six-month period and analyze the performance of their *subsequent* trades. These profitable day traders continue to earn stellar returns. The average day trader in this group earns a semi-annual income of over $NT 1 million from his day trading activity, though the group's median income is a more modest $NT 126,000. The stocks they buy outperform those that they sell by 62 basis points *per day*. These profits survive transaction costs. In other words, there is strong evidence of persistence in the ability of day traders.

Our analysis makes clear the need for comprehensive risk disclosure. Prospective day traders should be apprised of their likelihood of success: only two out of ten make money; fewer do so consistently.

References

Barber, Brad M., Yi-Tsung Lee, Yu-Jane Liu, and Terrance Odean, 2003, Who gains from trade? Evidence from Taiwan, working paper, University of California.

Barber, Brad M., and Terrance Odean, 2000, Trading is hazardous to your wealth: The common stock investment performance of individual investors, *Journal of Finance*, 2000, Vol. 55, No. 2, p.773-806.

Barber, Brad M., and Terrance Odean, 2001, Boys will be boys: Gender, overconfidence, and common stock investment, *Quarterly Journal of Economics*, 116, 261-292.

Chae, Joon, and Albert Wang, 2003, Who makes markets? Do dealers provide or take liquidity? working paper #4434-03, MIT, Cambridge, MA.

Coval, Joshua D., David Hirshleifer, and Tyler Shumway, 2003, Can individual investors beat the market, working paper, Harvard Business School, Cambridge, MA.

Garvey, Ryan, and Anthony Murphy, 2001, How profitable day traders trade: An examination of trading profits, working paper, University College Dublin, Dublin, Ireland.

Harris, Jeffrey H., and Paul H. Schultz, 1998, The trading profits of SOES bandits, *Journal of Financial Economics*, 50, 39-62.

Linnainmaa, Juhani, 2003, The Anatomy of Day Traders, working paper, UCLA, Los Angeles, CA.

Odean, Terrance, 1998, Volume, volatility, price, and profit when all traders are above average, *Journal of Finance* 53, 1887-1934.

Odean, Terrance, 1999, Do investors trade too much?, *American Economic Review*, 89, 1279-1298.

Seasholes, Mark and Guojun Wu, 2004, Profiting from predictability: Smart traders, daily price limits, and investor attention, working paper, UC Berkeley.

Table 1: Mean Daily Values of All Trade and Day Trade by Investor Categories: January 1995 to December 1999

The value of all trade is the value of buys and sells. The value of day trades is the value of day purchases and day sales. Day trades are defined as the purchase and sale of the same stock by the same investor on one day.

	ALL TRADE		DAY TRADE		Day Trade percentage of All Trade
Investor Type	Value ($NT Mil)	Percentage of All Trade	Value ($NT Mil)	Percentage of Day Trade	
All Traders	170,148	100.0	34,912	100.0	20.5
All Individuals	152,232	89.5	34,030	97.5	22.4
All Institutions	17,916	10.5	883	2.5	4.9
Corporations	7,453	4.4	682	2.0	9.1
Dealers	2,503	1.5	141	0.4	5.6
Foreigners	3,272	1.9	59	0.2	1.8
Mutual Funds	4,688	2.8	0.7	0.0	0.0

Table 2: Mean Daily Values of All Trade and Day Trade by Individual Investor Categories: July 1995 to December 1999

Individual investors are partitioned into category based on (1) the total value of their day trading in the prior six months and (2) the standardized net profits from trading in months *t-6* to *t-1*. The table presents descriptive statistics on the trades of each group in the month *t*. The value of all trade is the value of buys and sells. The value of day trades is the value of day purchases and day sales. Mean number of accounts are mean number of accounts contributing trades to each group in average month.

	ALL TRADE		DAY TRADE				
Partition Range	Value ($NT Mil)	Percentage of All Trade	Value ($NT Mil)	Percentage of Day Trade	Day Trade percentage of All Trade	Mean Number of Accounts	Mean Daily Volume per Account ($NT)
All Individuals	161,165	100.0	36,310	100.0	22.5	925,841	174,074
Panel A: Individual Investors Partitioned by Past Day Trading Activity							
(600m, ∞)	11,450	7.1	6,276	17.3	54.8	862	13,280,286
(240m, 600m)	12,448	7.7	5,422	14.9	43.6	2,224	5,597,896
(90m, 240m)	18,078	11.2	6,542	18.0	36.2	6,303	2,868,030
(15m, 90m)	36,003	22.3	9,537	26.3	26.5	30,944	1,163,490
(1.5m,15m)	32,923	20.4	5,292	14.6	16.1	87,833	374,837
(0.3m, 15m)	10,433	6.5	1,322	3.6	12.7	78,668	132,627
(0, 0.3m)	39,828	24.7	1,920	5.3	4.8	719,007	55,393
Panel B: Individual Investors Partitioned by Standardized Past Profits							
(.2, ∞)	2,276	1.4	1,198	3.3	52.6	393	5,785,526
(.1, .2)	3,706	2.3	1,484	4.1	40.0	1,062	3,490,474
(0, .1)	6,936	4.3	2,379	6.6	34.3	3,027	2,291,903
(-.2, 0)	22,816	14.2	7,365	20.3	32.3	17,069	1,336,690
(-.4,-.2)	21,633	13.4	8,460	23.3	39.1	22,158	976,309
(∞, -.4)	8,287	5.1	4,278	11.8	51.6	7,638	1,084,850
No Rank	95,511	59.3	11,145	30.7	11.7	874,495	109,219

Table 3: Mean Gross Daily Abnormal Return and Profits for Day Traders

The table evaluates the gross performance of trades in month *t* for day traders partitioned based on their trading in months *t-6* to *t-1*. Individual investors are partitioned into categories based on the total value of their day trading in the prior six months (panel A) and the standardized net profits from trading in the prior six months (panel B). On each day, the buy less sell return is the intraday return on stocks bought from the average purchase price to the closing price less the intraday return on stocks sold from the average sale price to the closing price. On each day, the daily gross profit is calculated as $\pi_\tau = \sum S_b(P_c - P_b) - S_s(P_c - P_s)$, where S_b and S_s are the total number of shares bought and sold, P_b and P_s are the average purchase price and the average sale price, and P_c is the closing price of the stock on day τ. On each day, profits are summed across all stocks and accounts. Statistical significance is based on the mean of the time-series of daily returns (or profits) and the time-series standard deviation of returns (or profits).

Partition Range	Buy Return less Sell Return	t-stat	Mean Daily Gross Profit ($NT Mil)	t-stat	Percentage of Days with Profit
Panel A: Individual Investors Partitioned by Past Day Trading Activity					
(600m, ∞)	0.305	37.99*	21.426	26.64*	90.7*
(240m, 600m)	0.107	20.42*	9.629	20.96*	80.4*
(90m, 240m)	0.030	7.37*	5.332	12.40*	67.2*
(15m, 90m)	-0.039	-14.43*	-3.460	-5.65*	42.8*
(1.5m,15m)	-0.071	-30.93*	-11.681	-19.19*	21.2*
(0.3m, 15m)	-0.061	-21.18*	-4.959	-20.53*	20.8*
(0, 0.3m)	-0.047	-12.27*	-24.325	-18.34*	21.2*
Panel B: Individual Investors Partitioned by Standardized Past Profits					
(.2, ∞)	0.622	61.73*	8.671	28.92*	97.0*
(.1, .2)	0.438	48.03*	10.842	30.36*	94.9*
(0, .1)	0.296	40.33*	14.030	28.24*	92.1*
(-.2, 0)	0.101	28.67*	16.342	25.13*	89.3*
(-.4,-.2)	-0.094	-21.24*	-14.477	-18.35*	21.1*
(∞, -.4)	-0.240	-25.56*	-12.419	-21.49*	18.0*

* - reliably different from zero (or 50 percent) at the 1 percent significance level.

Table 4: Mean Net Profits for Day Traders

The table evaluates the net performance of trades in month *t* for day traders partitioned based on their trading in months *t-6* to *t-1*. Individual investors are partitioned into categories based on the total value of their day trading in the prior six months (panel A) and the standardized net profits from trading in the prior six months (panel B). On each day, the daily net profit is calculated as:

$$\pi_\tau = \sum S_b(P_c \quad P_b) \quad S_s\left(P_c \quad P_s\right) \quad .001(S_bP_b \quad S_sP_s) \quad .003(S_sP_s),$$

where S_b and S_s are the total number of shares bought and sold, P_b and P_s are the average purchase price and the average sale price, and P_c is the closing price of the stock on day τ. On each day, profits are summed across all stocks and accounts. Statistical significance is based on the mean of the time-series of daily net profits and the time-series standard deviation of daily net profits.

Partition Range	Mean Daily Net Profit ($NT Mil)	t-stat	Percentage of Days with Profit	Number of Accounts	Mean Daily Net Profit (Loss) per Account
Panel A: Individual Investors Partitioned by Past Day Trading Activity					
(600m, ∞)	-7.278	-12.47*	28.3*	862	-8,443
(240m, 600m)	-21.588	-36.31*	4.0*	2,224	-9,707
(90m, 240m)	-40.033	-46.64*	0.7*	6,303	-6,351
(15m, 90m)	-93.851	-55.80*	0.2*	30,944	-3,033
(1.5m,15m)	-94.230	-58.91*	0.0*	87,833	-1,073
(0.3m, 15m)	-31.033	-55.38*	0.0*	78,668	-394
(0, 0.3m)	-122.950	-46.55*	0.0*	719,007	-171
Panel B: Individual Investors Partitioned by Standardized Past Profits					
(.2, ∞)	2.960	13.85*	71.1*	393	7,532
(.1, .2)	1.535	5.70*	49.5	1,062	1,445
(0, .1)	-3.367	-8.45*	30.3*	3,027	-1,112
(-.2, 0)	-40.901	-42.57*	2.6*	17,069	-2,396
(-.4,-.2)	-68.694	-48.11*	0.0*	22,158	-3,100
(∞, -.4)	-33.167	-44.73*	0.2*	7,638	-4,342

* - reliably different from zero (or 50 percent) at the 1 percent significance level.

Table 5: Percentage of Trades Emanating from Passive and Aggressive Limit Orders

Orders are classified as aggressive if (1) a buy limit order was placed at a price greater than or equal to the last lowest unfilled sell limit order price or (2) a sell limit order was placed at a price less than or equal to the last highest unfilled buy limit order price. Orders with prices between the last highest unfilled buy limit order price and the last lowest unfilled sell limit order price are classified as indeterminate. All other orders are classified as passive. Orders are then matched to trades to classify trades as passive, aggressive, or indeterminate. The indeterminate category includes trades that we are unable to match to orders.

	Percentage of Trades Emanating from Orders Classified as:		
Partition Range	Passive	Aggressive	Indeterminate
All Individual Investors	25.2	64.9	9.9
Panel A: Individual Investors Partitioned by Past Day Trading Activity			
(600m, ∞)	16.3	73.7	10.0
(240m, 600m)	17.7	72.3	10.1
(90m, 240m)	19.5	70.4	10.1
(15m, 90m)	21.9	68.0	10.1
(1.5m,15m)	25.6	64.4	10.0
(0.3m, 15m)	28.5	61.5	10.0
(0, 0.3m)	34.6	55.9	9.5
Panel B: Individual Investors Partitioned by Standardized Past Profits			
(.2, ∞)	14.3	74.8	10.9
(.1, .2)	16.2	73.7	10.1
(0, .1)	17.7	72.1	10.3
(-.2, 0)	19.4	70.2	10.3
(-.4,-.2)	19.7	70.1	10.2
(∞, -.4)	16.6	73.3	10.1

Table 6: Cross-Sectional Performance of Day Traders

Performance is measured at the investor level over a six month period. Individual investors are partitioned into categories based on the total value of their day trading in the prior six months (panel A) and the standardized net profits from trading in the prior six months (panel B). On each day for each investor, the daily net profit is calculated as:

$$\pi_\tau = \sum S_b(P_c \quad P_b) \quad S_s\left(P_c \quad P_s\right) \quad .0007(S_bP_b \quad S_sP_s) \quad .003(S_sP_s),$$

where S_b and S_s are the total number of shares bought and sold, P_b and P_s are the average purchase price and the average sale price, and P_c is the closing price of the stock on day τ. For each investor, profits are summed across all stocks and days. Statistical significance is based on the cross-sectional mean and cross-sectional standard deviation of investors daily profits. Number of investors is the mean number of investors across the nine six-month evaluation periods.

Partition Range	Number of Investors	% of Investors with Profits	Mean Profit per Investor over 6 mths ($NT)	Median Profit per Investor over 6 mths ($NT)
Panel A: Individual Investors Partitioned by Past Day Trading Activity				
(600m, ∞)	845	39.0*	-360,138*	-282,600*
(240m, 600m)	2,271	21.0*	-777,121*	-481,127*
(90m, 240m)	6,517	15.6*	-574,011*	-319,939*
(15m, 90m)	32,400	14.6*	-302,449*	-142,474*
(1.5m,15m)	93,912	16.6*	-117,572*	-46,146*
(0.3m, 15m)	87,951	19.6*	-45,063*	-15,597*
Panel B: Individual Investors Partitioned by Standardized Past Profits				
(.2, ∞)	386	65.9*	1,137,230*	125,761*
(.1, .2)	1,049	44.8*	299,124*	-8,377
(0, .1)	3,024	30.8*	-41,853*	-36,783*
(-.2, 0)	17,348	15.6*	-223,684*	-73,795*
(-.4,-.2)	22,664	6.6*	-308,131*	-110,860*
(∞, -.4)	7,923	3.1*	-434,195*	-166,370*

* reliably different from zero (or 50 percent) at the one percent significance level.

Table 7: The Effect of Performance on Subsequent Day Trading Activity

The table presents the aggregate and mean percentage change in day trading activity for various subgroups of day traders. Individual investors are partitioned first into categories based on the total value of their day trading in the prior six months. Then, within each day trading partition, investors are further partitioned based on their past standardized profits. Within each group, we calculate the aggregate percentage change as the percentage change in total day trading by the group from the six-month ranking period to the subsequent six-month period. The mean percentage change in day trading across investors calculates the percentage change in day trading for each investor within a category and then averages the percentage change in day trading activity across investors.

Range for Standardized Profits	Number of Investors	Day Trading per Account ($NT Mil)	Group Aggregate % Change in Day Trading	Mean % Chg. in Day Trading (across Investors)
Panel A: Investors with more than **$NT 90 mil**. in six-month ranking period				
(.2, ∞)	362	630.2	-2.1	19.4
(.1, .2)	463	498.4	-14.7	-4.5
(0, .1)	811	366.4	-14.6	-7.3
(-.2, 0)	2,962	264.2	-24.4	-20.4
(-.4,-.2)	3,678	227.0	-35.8	-31.0
(∞, -.4)	1,828	247.3	-39.2	-33.3
All Investors	10,104	279.6	-26.5	-23.4
Panel B: Investors with between **$NT 45 and 90 mil**. in day trades during six-month ranking period				
(.2, ∞)	152	63.9	45.3	44.1
(.1, .2)	275	63.2	17.7	18.7
(0, .1)	642	63.4	2.9	3.4
(-.2, 0)	2,898	63.1	-7.5	-6.6
(-.4,-.2)	3,675	63.3	-14.5	-13.8
(∞, -.4)	1,531	63.5	-17.1	-15.9
All Investors	9,173	63.3	-9.6	-8.8
Panel C: Investors with between **$NT 25 and 45 mil**. in day trades during six-month ranking period				
(.2, ∞)	193	33.2	28.4	27.8
(.1, .2)	334	33.5	16.7	16.5
(0, .1)	819	33.4	3.8	4.6
(-.2, 0)	3,833	33.4	2.6	3.1
(-.4,-.2)	4,566	33.5	-0.1	0.5
(∞, -.4)	1,780	33.6	1.2	1.7
All Investors	11,524	33.5	2.2	2.8
Panel D: Investors with between **$NT 15 and 25 mil**. in day trades during six-month ranking period				
(.2, ∞)	225	19.3	72.1	73.3
(.1, .2)	384	19.3	24.5	25.1
(0, .1)	964	19.3	15.0	15.5
(-.2, 0)	4,487	19.4	12.7	13.2
(-.4,-.2)	5,173	19.4	13.8	14.4
(∞, -.4)	1,857	19.4	20.5	21.0
All Investors	13,090	19.4	15.8	16.4

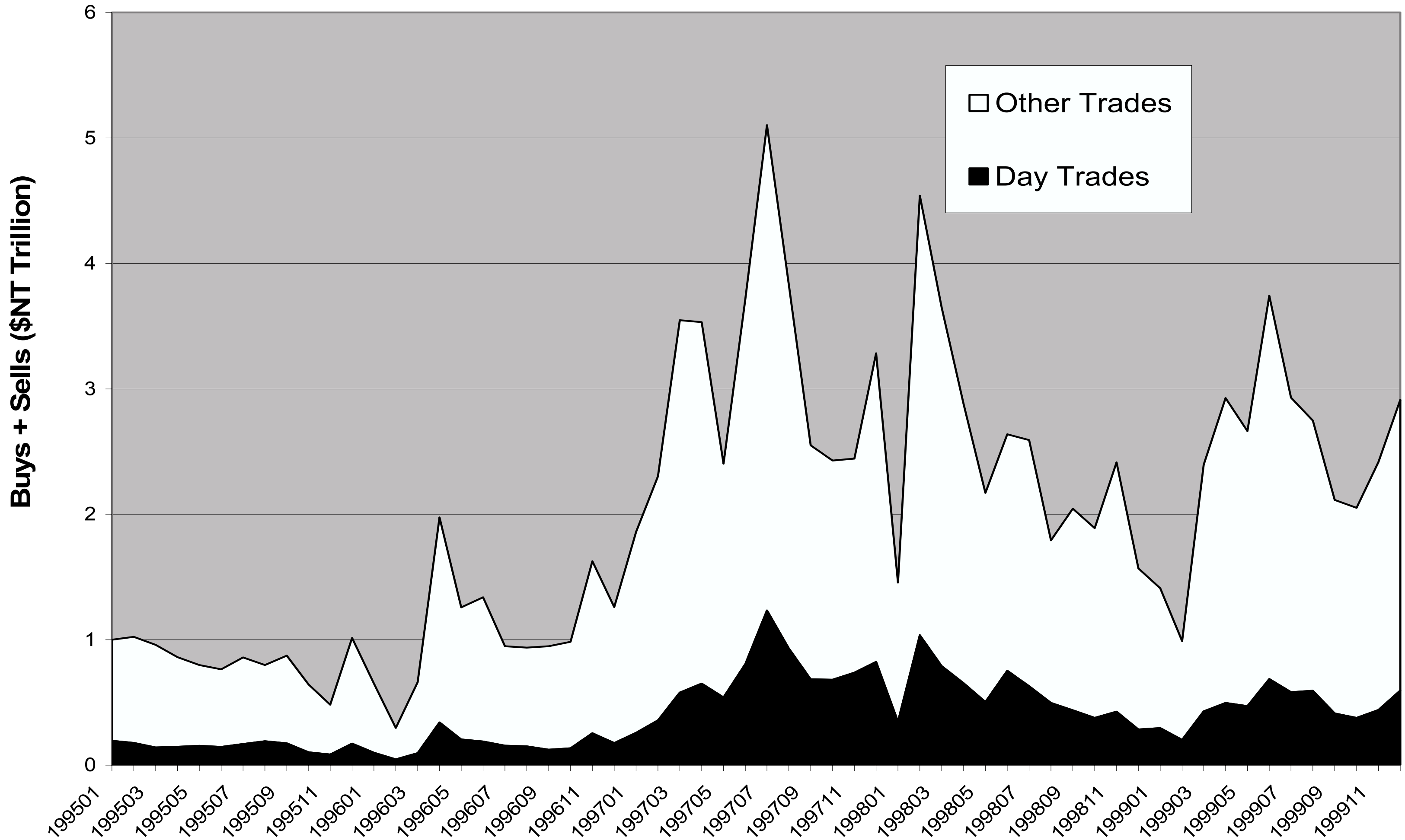

Figure 1: Total Trading and Day Trading in Taiwan: 1995 to 1999

Day trading is defined as the purchase and sale of the same stock on the same day by the same investor.