

Chapter 28 Individual Investor Trading

NING ZHU

University of California, Davis and Nomura International

ABSTRACT

Individual investors trade stocks in a way very different from what mainstream financial economic theory would predict: they generate too much trading volume and yet obtain below-benchmark performance. This chapter overviews major 'puzzles' of individual investor trading. The extant literature suggests that behavioral biases and psychological explanations are largely responsible for many of the observed patterns in individual trading. The chapter discusses three aspects of individual investor trading, namely the disposition effect, the local bias, and the ability to learn over trading, followed by a discussion of the costs associated with individual investor trading.

INTRODUCTION

The extraordinarily high degree of trading in financial markets represents major challenges to the field of finance. The New York Stock Exchange (NYSE) website indicates that the annual share turnover rate in the early 2000s on the NYSE was close to 100 percent, amounting to a total volume of about 350 billion shares per year. Using reasonable estimates of per-trade costs, this implies that the investing public voluntarily pays several billion dollars to financial intermediaries every year. International markets, especially many stock markets in Asia, witness even higher turnovers (Barber, Lee, Liu, and Odean, 2009, Feng and Seasholes, 2004) and trading costs. Such stylized facts are in stark contrast with many theoretical models in finance such as those found in Aumann (1976) and Milgrom and Stokey (1982), which argue that there should be no trading at all.

Scholars have devoted increasing research to understanding why investors, especially individual investors, trade and the implications of individual investor trading to the financial markets. This chapter has three major objectives. First, the chapter will summarize the major motivations for individual investors' trades and provide empirical evidence testing respective hypotheses regarding trading motivations. Evidence shows that behavioral explanations are responsible for many of the interesting findings on individual investor trading.

Second, the chapter focuses on three important aspects of individual investor trading; (1) the disposition effect, (2) the tendency to trade geographically nearby stocks, and (3) individual investors' ability to learn about their investment skills over the course of the investment. Although rational predictions can explain part of each phenomena, the extant literature largely agree that behavioral explanations are responsible for these three phenomena.

Lastly, the chapter reviews how investor trading activities affect the financial markets. Evidence shows that individual investors trade in strikingly similar fashions. Such correlated trading activities question the traditional view that individual investors are 'noise traders' and their trading activities cancel each other, leaving no impact on the market. As a matter of fact, several recent studies present convincing evidence that trading activities by retail investors can influence asset prices not only in the con-current period but also in future periods. In addition to reviewing individual investors' impact on asset price formation, the last section also reviews the transaction costs and time costs incurred in individual investor trading.

The rest of the chapter proceeds as follows. The first section provides an overview of the motivations for individual investor trading. The second section focuses on three major aspects of individual investor trading that have received considerable academic research, namely the disposition effect, local bias, and individual investor learning abilities. The third section provides an assessment of the implication of individual investor trading in terms of asset price formation and social welfare evaluation. The last section concludes the topic.

OVERVIEW OF INDIVIDUAL INVESTOR TRADING

Rational Explanations

Under the traditional financial economics literature, there are several major rational reasons for individual investors to trade. For example, Grossman and Stiglitz (1980) argue that investors will trade when the marginal benefit of doing so is greater than or at least equal to its costs. In particular, they suggest that information, or specifically private information, should be a major motivation for investors to trade.

Of course, there are several other motivations to trade in a more realistic and dynamic market. For example, individuals may need to trade in order to rebalance their portfolios after some stock prices substantially change in price, thus altering their portfolio weights. Trading in those stocks allow them to maintain their preferred asset allocation structure. Separately, individuals may need to liquidate part of their equity investment in order to raise needed cash for consumption purposes.

Further, if one were to believe the life cycle hypothesis of Modigliani and Brumberg (1963), one would expect rational economic agents to smooth their consumption by appropriately investing and borrowing based on expectations about lifetime income. This means that investment and trading decisions should vary depending on the life cycle of an investor. Such inter-temporal borrowing/consumption decisions should also lead to more trading activities than those predicted in a simple static model.

Finally, Hong, Kurbik, and Stein (2004) propose social interaction may partly induce stock market participation and trading. Their model predicts that any given 'social' investor finds the market more attractive when more of his peers participate. Using the Health and Retirement Study data, they provide strong support for their prediction in that more social households, those households who have more social interaction with the community, are substantially more likely to participate in the stock market and hence stock trading.

Tax Motivations

Another apparent reason for individual investor trading is tax considerations. Given that tax laws treat various components of investment returns such as interests, dividends, and capital gains differently, rational investors who face tax obligations are expected to trade so as to take advantage of the tax laws. Barber and Odean (2004) use brokerage account data and analyze the tax awareness of individual investors in the United States. They find that investors prefer to locate bonds and mutual funds in retirement accounts and realize stock losses in their taxable accounts towards year end, which supports the idea that individuals are conscious of taxes when they make investment decisions. However, Barber and Odean also find that investors trade actively in their taxable accounts, realize gains more frequently than losses, and locate a material portion of their bonds in taxable accounts, thereby hurting their after-tax returns.

Grinblatt and Keloharju (2004) find a similar level of importance for tax consideration in investment decisions from the Finnish stock market. They show that individual investors in Finland realize losses more than gains towards the end of December. Moreover, Finnish investors repurchase the same stocks recently sold. The repurchase rate depends on the magnitude of previous losses. Such predictable trading pattern generates net tax-loss buying pressure that is negative before the turn of the year and positive afterwards. They also conclude that such tax-motivated trading activities are responsible for the turn-of-the-year effect and the cross-section of stock returns around year ends.

Behavioral Explanations

In contrast with the rational models, Odean (1998b), Gervais and Odean (2001), and Daniel, Hirshleifer, and Subrahmanyam (1998) develop theoretical models of financial markets where investors are susceptible to behavioral biases such as overconfidence and self-attribution. Investors in such models cannot accurately assess their investment skills and may become

(wrongfully) over-confident about their investment abilities over time. One attractive feature of such models is that they generate predictions that are consistent with empirical findings on excessive trading activities by individual investors.

Odean (1999) shows that the trades of many investors not only fail to cover transaction costs but also tend to lose money even before transaction costs. He finds that behavioral explanations, such as over-confidence, the disposition effect, and a misguided belief in contrarianism or momentum, are responsible for such surprising findings.

Studies by Barber and Odean (2001, 2002) provide further support for the over-confidence explanations. Specifically, Barber and Odean (2001) reveal evidence on investor profits and performance between men and women. By showing that women outperform men in their individual stock investments and by arguing that men are overall more confident than women about themselves, they conclude that over-confidence induces more trading but hurts investment performance. In a follow up study, Barber and Odean (2002) find that investors who choose to make investments online are better performers than those who do not go online before they switch to online trading. However, those who do switch find that their performance worsens, especially in net returns, after they trade online. Again, the authors attribute such shift in performance to overconfidence and the resulting imprudent trades.

Outside the United States, Grinblatt and Keloharju (2009) analyze overconfidence, sensation seeking and trading with an interesting data source that combines investors' equity trading with data from an investor's tax filings, driving record, and psychological profile. Controlling for a host of variables including wealth, income, age, number of stocks owned, marital status, and occupation, the authors find that overconfident investors and those investors most prone to sensation seeking trade more frequently. Thus, they also support the hypothesis that over-confidence is responsible for the heightened level of trading activities.

Other anomalies in individual investor trading can be traced back to other behavioral foundations such as availability and representativeness. Barber and Odean (2008) test and confirm the hypothesis that individual investors are net buyers of attention grabbing stocks. Due to the difficulty in searching among thousands of stocks, individuals are more likely to invest in those stocks that attract their attention. In contrast, individual investors do not face the same search problem when selling because they tend to sell only stocks they already own. The authors argue that many investors consider purchasing only stocks that have first caught their attention and alludes that preferences determine choices after attention has determined the choice set. Confirming these findings, Grinblatt and Keloharju (2001) find that past returns and historical price patterns, such as being at a monthly high or low, affect trading with comprehensive trading record from the Finnish stock market.

Dhar, Goetzmann, Shepherd, and Zhu (2005) provide one example of how investors focus on more salient information and events available to them by studying the trading activities around stock splits. They find that a higher fraction of post-split trades are made by less sophisticated investors. Individual investors increase their aggregate buying activities following stock splits while professional investors reduce their buying activity. This behavior supports the common belief that stock splits help attract new investors and improve stock liquidity. However, given that there is virtually no new information around the ex-dates of stock splits, the events themselves and the otherwise unimportant numeraire effect (i.e., the number of shares doubles and the prices halves accordingly) apparently induce individuals to trade.

Another interesting example of the (misguided) attention is Rashes' (2001) paper on the comovement of stocks with similar ticker symbols. For one such pair of firms, there is a significant correlation between returns, volume, and volatility at short frequencies despite the low correlation in their fundamental values. This anomaly provides an example of noise traders

fixating their attention at the most easily accessible, but flawed information. It reveals the effect of noise traders on stock prices independent of changes in information and expectations.

In sum, the above studies suggest that factors other than traditional rational explanations are responsible for many observed trading activities in financial markets.

THREE ASPECTS OF INDIVIDUAL INVESTOR TRADING

Disposition Effect

The disposition effect, which is the tendency to hold on to losing stocks for too long while selling winning stocks too early, is arguably one of the most studied patterns of individual investing. Some twenty years ago, Shefrin and Statman (1984) uncovered an interesting pattern that individual investors hold different parts of their portfolios for varying periods that depended on the previous performance of those stocks.

More recently, Odean (1998a) also finds evidence of a disposition effect with a large sample of individual investors from a large discount brokerage firm. In addition, Odean finds that such behavior is probably not motivated by rational reasons, as indicated by the fact that past winners do better than losers following the date of sale of stock by an individual investor, suggesting a perverse outcome to the trades. Instead, he argues that such findings are consistent with predictions from prospect theory and value gains and losses of the same magnitude differently. Nofsinger (2007) argues that realizing profits allows one to maintain self-esteem while realizing losses causes one to implicitly admit an erroneous investment decision, and hence is avoided.

Kaustia (2004) provides another test of the disposition effect and includes the reference price effect within the context of initial public offering (IPO) markets. Because the offer price is a common purchase price, the disposition effect is clearly identifiable. Kaustia finds that volume is lower if the stock price is below the offer price and if there is a sharp upsurge in volume when the price surpasses the offer price for the first time. Furthermore, there also is a significant

increase in volume if the stock achieves new maximum and minimum stock prices, again suggesting evidence of reference price effects. Such studies have added to our understanding of why people trade, but a calibration of a specific model that would deliver the magnitudes of volume observed appears desirable to build a complete understanding of trading activity.

One striking aspect about extant findings on the disposition effect is its robustness across different types of markets. For example, Weber and Camerer (1998) carry out experiments specially designed to see if subjects would exhibit disposition effects. In their laboratory experiment, subjects bought and sold shares in six risky assets. Asset prices fluctuated in each period. Contrary to Bayesian optimization, subjects did tend to sell winners and keep losers. When the shares were automatically sold after each period, the disposition effect was greatly reduced.

Outside the experiment laboratory, Heath, Huddart, and Lang. (1999) confirm the disposition effect in employee option exercising in the United States. Using data on over 50,000 employees at seven corporations, they find that employee's exercise of stock options is strongly linked to the stocks' past performance. Employee exercise activity roughly doubles when the stock price exceeds the maximum price attained during the previous year. In a separate study, Genesove and Mayer (2001) find the same pattern among household transaction of condos in Boston. They show that condominium owners subject to nominal losses set higher asking prices of 25-35 percent of the difference between the property's expected selling price and their original purchase price and are less successful in selling their listed properties than other sellers.

Another aspect of the disposition effect is that there are an increasing number of studies that show that the disposition effect is widespread among markets outside the United States. The following provides a review of only a few of them. In a comprehensive study of trading activity using a Finnish data set, Grinblatt and Keloharju (2001b) confirm a disposition effect. They also show that there are reference price effects, in that individuals are more likely to sell if

the stock price attains a prior month high. Feng and Seasholes (2005) and Chen, Kim, Nofsinger, and Rui (2007) find the disposition effect among their sample of individual investors from China and Shapira and Venezia (2001) find the disposition effect among a representative sample of investors at the Tel-Aviv stock exchange

Despite the fact that the disposition effect is widely documented at the market level, Dhar and Zhu (2005) find that there are considerable variations in the disposition effect at the individual investor level. They analyze the trading records of a major discount brokerage house to investigate the disposition effect and try to explain the cross-sectional difference in the disposition effect exhibited by distinct investors. Building on the findings in experimental economics and social psychology, the authors hypothesize that differences in investor literacy about financial markets and trading frequency are responsible in part for the variation in individual disposition effect. Using demographic and socioeconomic variables as proxies for investor literacy, the paper finds empirical evidence that wealthier individuals and individuals employed in professional occupations exhibit a lower disposition effect. Consistent with experimental economics, trading frequency also tends to reduce the disposition effect.

Another finding of Dhar and Zhu (2005) is that a considerable fraction of the sample investors display no disposition effect and even demonstrate opposite trading patterns to the disposition effect in many cases. Such findings motivate future studies to take a closer look at the causes behind the disposition effect, other than the long-standing explanation of the prospect theory.

Barberis and Xiong (2009) analyze the trading behavior of investors with prospect theory preferences in a theoretical setup. The authors find that, at least for the simplest implementation of prospect theory, the link between these preferences and the disposition effect is not as strong as previously speculated. They show that prospect theory sometimes predicts the opposite behavior as described by the disposition effect depending on the magnitude of the gains/losses

and the frequency at which investors evaluate their performance. This new exploration on the prospect theory and disposition effect brings some new perspective to the disposition effect and has the potential of stimulating even further studies around this topic.

Local Bias

Coval and Moskowitz (1999) uncover a pattern that U.S. institutional investors favor geographically nearby companies in their investment process. Such findings suggest that the home bias in the literature of macro-economics (the tendency to invest in domestic vs. international equities) is not limited to the international context but also is prevalent among domestic investment choices.

Following Coval and Moskowitz's findings on institutional investors, Zhu (2005) and Ivkovich and Weisbenner (2005) separately study individual investors' tendency to invest in stocks that are geographically nearby. Zhu focuses more on the trading activities by individual investors while Ivkovich and Weisbenner mainly study individual portfolio holdings. Although both studies confirm the local bias by showing that individuals are more likely to invest in companies closer to their home, the authors disagree with respect to what drives the local bias. Ivkovich and Weisbenner show that the local portion of an individual investor's portfolio outperforms the non-local portion. In contrast, Zhu fails to find significant differences in the purchase transactions regardless of the distance between individual investors and the headquarters of the invested companies.

A recent paper by Seasholes and Zhu (2008) points out that the inference based on portfolio positions in Ivkovich and Weisbenner (2005) is flawed because it fails to account for the contemporaneous correlation in the cross-section of stock returns and hence inflates the statistical significance of their results. More importantly, the Seasholes and Zhu find that after properly adjusting for local benchmark, the local part of individuals' portfolio underperforms the non-local part, hence questioning the information hypothesis in Ivkovich and Weisbenner.

Similar to the case of the disposition effect, international studies have also generated support to the local bias in individual investor trading. Grinblatt and Keloharju (2001a) that investors are more likely to buy, sell, and hold the stocks of Finnish firms that are (1) located close to the investor, (2) communicate in the investor's native tongue, and (3) have chief executives of the same cultural background. Such an effect is less prevalent among the most investment-savvy institutions than they are among both households and less savvy institutions. Feng and Seasholes (2004) confirm that investors are interested in investing in nearby companies with their sample of Chinese investors. Furthermore, they find that locality matters to individuals' trading decisions in a systematic way. The buy and sell transactions by investors from the same location exhibit striking similarity. Such findings emphasize how location matters to individual investor trading and such correlated local trading may exert impact on asset prices.

Learning over Time

Given the increasing evidence on behavioral biases in individual investor trading, reconciling such stylized facts and the mainstream rational paradigm in the financial economics literature becomes important. Under the rational paradigm, agent rationality is a classic assumption that simplifies the decision-making processes associated with constrained optimization problems, allowing economic phenomena to be analyzed with mathematical models. An important justification for this assumption is that agents are not likely to systematically make mistakes. For instance, Sargent (1993, p.) states that the assumption of rational expectations "does not deny that people often make forecasting errors, but it does suggest that errors will not persistently occur on one side or the other." While the argument is certainly appealing, it is not necessarily substantiated.

In contrast, behavioral finance theories by Gervais and Odean (2001) and Daniel, Hirshleifer, and Subrahmanyam (2001) argue that investors, especially individual investors, learn in an asymmetrical way. That is, individuals tend to credit investment success to their own

information or abilities and blame investment losses to luck. If such theories indeed depict how individuals learn throughout their investment tenure, it implies that most investors are overconfident and believe that they are better investors than they truly are. If this phenomenon were to pervade at the market level, one would observe 'puzzles' such as excessive trading and volatilities in the equity market.

Whether and how fast individual investors learn about their abilities hence becomes an important topic in the behavioral finance literature. Nicolosi, Peng, and Zhu. (2009) empirically tests whether individual investors learn about their stock selection ability from their own trading experience, and consequently adjust their trading behavior accordingly. The authors find that individuals indeed learn from their trading experience and adjust their subsequent trading activities accordingly. Individuals with better previous performance are more likely to increase their future trades than individuals with disappointing performance. Nicolasi et al. find that such evidence is stronger for individuals with overall better performance than those with worse performance. In addition, they find that although individuals respond to both previous gains and losses, they are much more responsive to previous gains (by increasing their subsequent trading intensity) than to previous losses (by decreasing their subsequent trading intensity). Hence, the authors suggest that investor learning behavior is probably more complex than any single theoretical prediction, rational or biased. Instead, individual learning activities seem to be more consistent with bounded rationality.

In addition, Seru, Shumway, and Stoffman (2009) use a large sample of individual investor records over a nine-year period from Finland and analyze how the disposition effect and trading performance change over individual investors' life cycle. An extra year of experience decreases the disposition effect of the median investor by about 4 percent, which accounts for about 5 percent of the increase in returns earned by these investors. By controlling for survival and unobserved individual heterogeneity, the authors show that investors in aggregate learn

partly by attrition, but that learning at the individual level is also important. Another important finding is that unsophisticated investors and investors who trade more learn faster about their abilities and that individual investors change their trading styles over time, as they gain more trading experiences and understanding about their own abilities.

IMPLICATIONS OF INDIVIDUAL INVESTOR TRADING

Individual Investor Trading and Asset Prices

Traditional economics and finance literature typically assumes that investors who trade without knowledge of fundamental information (i.e., the noise traders) do not have a material impact on asset prices or market stability as they trade in a rather atomic way and the influences that they generate cancel each other and leave no impact on the market.

DeLong, Shleifer, Summers, and Waldmann (1990a, 1990b, 1991) propose a theoretical framework to show how noise traders, those who trade upon noises instead of information, can indeed have considerable impact on financial market and asset prices. One key feature of their framework is that the noise trading can accumulate and move asset prices far from the fundamental value for an extended period time, which has the potential of changing the fundamental investors' beliefs and consequently altering their decisions.

Nofsinger and Sias (1999) document a positive correlation between changes institutional ownership and contemporaneous relationship. While such findings are open to many possibilities, they also suggest the possibility that trading activities by one class of investors can certainly exert influences on stock prices.

Barber, Odean, and Zhu (2009) analyze trading records for 66,465 households at a large discount broker and 665,533 investors at a large retail broker and find that the trading of individuals is highly correlated and surprisingly persistent. This systematic trading of individual investors is not primarily driven by passive reactions to institutional herding, by systematic changes in risk-aversion, or by taxes. Psychological biases likely contribute to the correlated

trading of individuals. They also find that biases lead investors to systematically buy stocks with strong recent performance, to refrain from selling stocks held for a loss, and to be net buyers of stocks with unusually high trading volume.

The findings of Odean and Zhu (2009) are of particular interest to the behavioral finance literature because it builds a necessary condition for individual investors to matter to financial markets. Observing that individual investors tend to commit the same kind of behavioral biases at or around the same time, such investors conceivably do not necessarily cancel each other's actions. Instead, the actions of individual investors have the potential of aggregating. If this is the case, individual investors cannot be treated merely as noise traders but more like a giant institution in terms of their potential impact on the markets.

Kumar and Lee (2006) find evidence supporting this conjecture. They use data from the same large discount brokerage firm and find that systematic retail trading explains return comovements for stocks with high retail concentration (i.e., small-cap, value, lower institutional ownership, and lower-priced stocks), especially if these stocks are also costly to arbitrage. Macroeconomic news and analyst earnings forecast revisions do not explain these results. Collectively, the findings support a role for investor sentiment in the formation of returns. In addition, the authors find evidence that individual investor trading activities are positively related to contemporaneous stock returns. That is, the stocks that individual investors heavily bought outperform those that individual investors heavily sold during the same period of individual investor actions. Such findings lend support to the idea that individual investors and their trading activities can influence asset prices.

Several more recent studies take closer look at the relationship between individual investor trading and future, instead of contemporaneous, stock returns. Kaniel, Saar, and Titman (2008) study the dynamic relation between net individual investor trading and short-horizon returns for a large cross-section of NYSE stocks. They report that individuals tend to

buy stocks following declines in the previous month and sell following price increases. In addition, the authors document positive excess returns in the month after intense buying by individuals and negative excess returns after individuals sell, which shows a distinct effect from the previously shown past return or volume effects. Kaniel et al. suggest that the study's findings are consistent with the notion that risk-averse individuals provide liquidity to meet institutional demand for immediacy.

The papers by Barber et al. (2009) and Hvidkjaer (2008) show that the imbalance in individual investor trading, in total, can indeed predict the cross-section of future stock returns over an extended period of time. Barber et al. investigate the relationship between individual investor trading activities using a large discount brokerage firm and also use market level data from the Trade and Quotes (TAQ) and Institute for the Study of Security Markets (ISSM) transaction data over the period 1983 to 2001. The authors document striking similarity between the observed trading imbalance from the brokerage firm data and that of the small-sized trades at the market level from the TAQ/ISSM data. Such findings confirm previous conjecture that trade size is a reasonable proxy for the trading of individual investors.

Consistent with their earlier study, Barber et al. (2009) also find that the order imbalance based on TAQ/ISSM data indicates strong similarity among individual trading in that individual investors predominantly buy (sell) the same stocks as each other contemporaneously and that individual investors predominantly buy (sell) the same stocks one week (month) as they did the previous week (month). Probably more importantly, the authors documents that the imbalance between purchases and sales of each stock by individual investors *positively* forecasts cross-sectional stock returns the subsequent week or month, but *negatively* forecasts cross-sectional stock returns at the longer horizons such as a year. Such results are particularly strong among stocks that are actively traded by individual investors and those that are difficult to arbitrage. The authors argue that their findings tie closely to the literature of noise trading framework.

In another closely related paper, Hvidkjaer (2008) documents the same pattern between individual trade imbalances and future stock returns in the cross-section. Furthermore, Hvidkjaer provides evidence that such findings are very robust independent of various horizons in evaluating small-trade imbalance and the predictability can last up to three years among small stocks and stocks with dominating small-sized trades.

Welfare Evaluation of Individual investor Trading

Trading losses and costs

In addition to their influence on asset pricing, scholars and regulators are also interested in the welfare implications of individual investor trading. Questions such as whether individual investors obtain (abnormal) returns and should engage in active trading have received increasing attention.

Extant evidence so far suggests that individual trading seems to hurt their financial wealth. Most existing studies fail to find that individuals obtain excess returns than simply following buy-and-hold strategies of index funds. Consistent with several other papers relying on the same data source, Coval, Hirshleifer, and Shumway. (2005) find that about 5 percent of individual investors manage to obtain abnormal returns over a market index, when risk exposures are properly controlled. Put in a different way, a dominating majority of the individual investors cannot beat the market.

Using the same data, Barber and Odean (2001) conclude that trading activities themselves pose significant costs to individual investors who invest in common stocks. They find that their sample investors from a large U.S. discount brokerage firm obtain lower net returns if they trade more. Specifically, the highest trading investors earn an annual return of 11.4 percent, compared to the market returns 17.9 percent. Their findings that individual investors who trade more obtain lower net returns carry important messages to regulators and brokerage firms regarding the merits of encouraging individual trading. Of particular importance

is to note that trading commissions and transactions costs have come down considerably because their study, largely due to technological development and increasing competition. Nevertheless, the key message of the study is that individual investors are over-confident about their own investment skills and consequently, trade upon noise, as opposed to true information, which results in unprofitable trades and wasted transaction costs.

Using a complete trading history of all investors in Taiwan, Barber, Dean, and Zhu. (2007) find that individual investor trading activities are not well founded and do not achieve particularly impressive returns. They show that the aggregate portfolio of individuals suffers an annual performance penalty of 3.8 percentage points. Individual investor losses are equivalent to 2.2 percent of Taiwan's gross domestic product or 2.8 percent of the total personal income. Interestingly, they find that the trades hurting individual investors the most are those about which individual investors are most aggressive. In contrast, institutions enjoy an annual performance boost of 1.5 percentage points and both the aggressive and passive trades of institutions are profitable. This study not only puts a number to the considerable losses that individual investors face at the national level, but also provides a few specific directions (such as behavioral biases and demand for liquidity) as to why individuals obtain such disappointing performance.

Related to Barber et al. (2007), Grinblatt and Keloharju (2000) conduct an important investigation regarding what motivates different types of investors to trade. Using a unique data set from Finland that has a comprehensive coverage of all types of investors in the market, the study analyses how past returns determine the propensity to buy and sell for different investor classes and investors of different sophistication. The authors find that foreign investors tend to be momentum investors, buying past winning stocks and selling past losers. Domestic investors, especially individual investors, tend to behave in the opposite manner, buying past losing stocks and selling past winning stocks. Consistent with Barber et al., Grinblatt and Keloharju find that

the portfolios of foreign investors seem to outperform the portfolios of individual investors even after controlling for behavior differences. Putting the above evidence from U.S. and foreign financial markets together, the extant research confirms that individual trading hurts individual investors' financial well being.

Individual Trading and Cost of Time

Researchers have not fully investigated one aspect of costs related to individual investor trading. In addition to the costs that individuals pay to execute their trades, they have to spend time conducting research for their trading activities. Despite the findings that individuals do not necessarily carefully process relevant information before trading, they probably spend time attempting to glean useful information ex ante. Individual households could reasonably substitute the time that they spend on research and trading for some other valuable activities in life.

Zhu (2007) studies this topic by looking at the adoption of mutual fund investment by households with different levels of the cost of their time. The study draws similar conclusions from two distinct sources, the Survey of Consumer Finance (SCF) and data on portfolio choice and trading from a large discount brokerage firm. With the SCF data, Zhu finds that households with higher cost of time are both more likely to invest in mutual funds and invest a greater fraction of their portfolios through mutual funds. Households with greater professional engagement invest a higher fraction of their portfolios in mutual funds. Ceteris paribus, a household with \$10,000 higher annual income or a household head working in a professional occupation, invests 7 and 9 percent more in mutual funds. Because such investors have greater professional responsibilities and a busier schedule, the findings support the Zhu's hypothesis that households with greater cost of time are less likely to engage in direct stock trading. .

Also consistent with this hypothesis, Zhu (2007) finds that households in which the household head is married or lives with a spouse/partner or owns their primary residences,

invest 6 and 15 percent more, respectively, in mutual funds, among all equity investments. Such households are busier with domestic activities and hence have less time for direct investment. This finding lends support to the hypothesis that investors with higher cost of time are more likely to invest in mutual funds.

Finally, Zhu (2007) finds that households that have more/less leisure time tend to invest less/more in mutual funds. Households in which household heads are retired invest 19 percent less while households in which both adults are full-time employed invest 12 percent more in mutual funds, providing further evidence that the cost of time influences household choice between direct and indirect investment in equities.

The analyses using data from a large discount brokerage firm confirm the findings from the Survey of Consumer Finance. In addition, such supplemental analyses confirm that households with higher costs of time are indeed less likely to trade common equities and turn over their portfolios less frequently.

SUMMARY AND CONCLUSIONS

This chapter summarizes extant research on individual investor trading activities. As the chapter suggests, rational theory cannot easily explain a large portion of individual investor trading activities.

Individual behavioral patterns, on the other hand, seem to provide more probable explanations to many findings of individual investor trading. Although many of individuals' trading patterns seem to jeopardize their financial well-being, some studies such as Calvet, Campbell, and Sodini (2007) suggest that the overall welfare loss from individuals' behavioral biases may indeed be limited. Although whether individuals suffer considerably from their trading activities remains an open question, more studies seem to confirm that their trading activities carry important weight to asset price formation. Therefore, unlike the traditional

wisdom that assumes individual investors to be insignificant noise traders, future studies in finance and economics have to take individual investors more seriously and devote more attention to individual investors' trading activities.

DISCUSSION QUESTIONS

1. List and explain the major puzzles related to individual investor trading.
2. Discuss the major psychological reasons for biases in individual investor trading.
3. Explain whether individual investors can beat the market in their trading.
4. Identify and discuss the costs to individual investor trading.

REFERENCES

- Aumann, Robert. J. 1976. "Agreeing to Disagree." *The Annals of Statistics* 4:6, 1236-1239.
- Barber, Brad M., Yi-Tsung Lee, Yu-Jane Liu, and Terrance Odean. 2009. "Who Loses from Trade? Evidence from Taiwan." *Review of Financial Studies* 22:2, 609-632.
- Barber, Brad M. and Terrance Odean. 2000. "Trading is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors." *Journal of Finance* 55:2, 773-806.
- Barber, Brad M. and Terrance Odean. 2001. "Boys Will Be Boys: Gender, Overconfidence, and Common Stock Investment." *Quarterly Journal of Economics* 116:1, 261-292.
- Barber, Brad M. and Terrence Odean. 2002. "Online Investors: Do the Slow Die First?" *Review of Financial Studies* 15:2, 455-487.
- Barber, Brad M. and Terrance Odean. 2004. "Are Individual Investors Tax Savvy? Evidence from Retail and Discount Brokerage Accounts." *Journal of Public Economics* 88:1-2, 419-442.
- Barber, Brad M. and Terrance Odean. 2008. "All that Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors." *Review of Financial Studies* 21:2, 785-818.
- Barber, Brad M., Terrance Odean, and Ning Zhu. 2007. "Systematic Noise." *Journal of Financial Markets*, forthcoming.
- Barber, Brad M., Terrance Odean, and Ning Zhu. 2009. "Do Retail Trades Move the Market?" *Review of Financial Studies* 22:1, 151-186.
- Barberis, Nicholas and Wei Xiong. 2009. "What Drives the Disposition Effect? An Analysis of a Long-standing Preference-based Explanation." *Journal of Finance* 64:2, 751-784.
- Calvet, Laurent, John Campbell, and Paolo Sodini. 2007. "Down or Out: Assessing the Welfare Cost of Household Investment Mistakes." *Journal of Political Economy* 115:5, 707-47.

- Chen, Gong-meng, Kenneth Kim, John Nofsinger, and Oliver Rui. 2007. "Trading Performance, Disposition Effect, Overconfidence, Representativeness Bias, and Experience of Emerging Market Investors." *Journal of Behavioral Decision Making* 20:4, 425-451.
- Coval, Joshua and Tobias J. Moskowitz. 1999. "Home Bias at Home." *Journal of Finance*, 54:6, 2045-73.
- Coval Joshua, David Hirshleifer and Tyler Shumway. 2005. "Can Individual Investors Beat the Market?" working paper, Harvard University.
- Daniel, Kent D., David Hirshleifer and Avanidhar Subrahmanyam. 1998. "Investor Psychology and Security Market Under- and Over-Reactions." *Journal of Finance* 53:6, 1839-1886.
- Daniel, Kent D., David Hirshleifer and Avanidhar Subrahmanyam. 2001. "Overconfidence, Arbitrage, and Equilibrium Asset Pricing." *Journal of Finance* 56:3, 921-965.
- DeLong, J. Bradford, Andre Shleifer, Lawrence H. Summers, and Robert J. Waldmann. 1990a. "Noise Trader Risk in Financial Markets." *Journal of Political Economy* 98:4, 703-738.
- DeLong, J. Bradford, Andrei Shleifer, Lawrence Summers, and Robert J Waldmann. 1990b. "Positive Feedback Investment Strategies and Destabilizing Rational Speculation." *Journal of Finance* 45:2, 375-395.
- DeLong, J. Bradford, Andrei Shleifer, Lawrence Summers, and Robert J. Waldmann. 1991. "The Survival of Noise Traders in Financial Markets." *Journal of Business* 64:1, 1-20.
- Dhar, Ravi, William Goetzmann, Shane Shepherd, and Ning Zhu. 2005. "The Impact of Clientele Change: Evidence from Stock Splits." working paper, Yale University and University of California.
- Dhar, Ravi and Ning Zhu. 2005. "Up Close and Personal: An Individual Level Analysis of the Disposition Effect." *Management Science* 52:5, 726-740.
- Feng, Lei and Mark Seasholes. 2004. "Correlated Trading and Location." *Journal of Finance* 59:5, 2117-2144.

- Feng, Lei and Mark Seasholes. 2005. "Do Investor Sophistication and Trading Experience Eliminate Behavioral Biases in Finance Markets?" *Review of Finance* 9:3, 305-351.
- Gervais, Simon and Terrance Odean. 2001. "Learning to be Overconfident." *Review of Financial Studies* 14:1, 1-27.
- Genesove, David and Chris Mayer. 2001. "Loss Aversion and Seller Behavior: Evidence from the Housing Market." *Quarterly Journal of Economics* 116:4, 1233-1260.
- Grinblatt, Mark and Matti Keloharju. 2000. "The Investment Behavior and Performance of Various Investor Types: A Study of Finland's Unique Data." *Journal of Financial Economics* 55:1, 43-67.
- Grinblatt, Mark and Matti Keloharju. 2001a. "How Distance, Language, and Culture Influence Stockholdings and Trades." *Journal of Finance* 56:3, 1053-73.
- Grinblatt, Mark and Matti Keloharju. 2001b. "What Makes Investors Trade?" *Journal of Finance* 56:2, 589-616.
- Grinblatt, Mark and Matti Keloharju. 2004. "Tax-Loss Trading and Wash Sales." *Journal of Financial Economics* 71:1, 51-76.
- Grinblatt, Mark and Matti Keloharju. 2009. "Sensation Seeking, Overconfidence, and Trading Activities." *Journal of Finance* 64:2, 549-578.
- Grossman, Stanford and Joseph Stiglitz. 1980. "On the Impossibility of Informationally Efficient Market." *American Economic Review* 70:3, 393-408.
- Heath, Chip, Steven Huddart, and Mark Lang. 1999. "Psychological Factors and Stock Option Exercise." *Quarterly Journal of Economics* 114:2, 601-627.
- Hong, Harrison, Jeffrey Kurbik, and Jeremy Stein. 2004. "Social Interaction and Stock Market Participation." *Journal of Finance* 54:1, 137-63.
- Hvidkjaer, Soeren. 2008. "Small Trades and the Cross-section of Stock Returns." *Review of Financial Studies* 21:3, 1123-1151

- Ivkovich, Zoran and Scott J. Weisbenner. 2005. "Local Does as Local Is: Information Content of the Geography of Individual Investors' Common Stock Investments." *Journal of Finance* 60:1, 267-306.
- Kaniel, Ron, Gideon Saar, and Sheridan Titman. 2008. "Individual Investor Trading and Stock Returns." *Journal of Finance* 63:1, 273-310.
- Kaustia, Markku. 2004. "Market-wide Impact of the Disposition Effect: Evidence from IPO Trading Volume." *Journal of Financial Markets* 7:2, 207-235.
- Kumar, Alok and Charles M. C. Lee. 2006. "Retail Investor Sentiment and Return Comovements." *Journal of Finance* 61:5, 2451-2486.
- Milgrom, Paul and Nancy Stokey. 1982. "Information, Trade, and Common Knowledge." *Journal of Economic Theory* 26:1, 17-27.
- Modigliani, Franco and Richard Brumberg. 1963. "The 'Life Cycle' Hypothesis of Saving: Aggregate Implications and Tests." *American Economic Review* 53:1, 55-84.
- Nicolosi, Gina, Liang Peng, and Ning Zhu. 2009. "Do Individual Investors Learn from Their Trading Experience?" *Journal of Financial Markets* 12:2, 317-336.
- Nofsinger, John and Richard Sias. 1999. "Herding and Feedback Trading by Institutional and Individual Investors." *Journal of Finance* 54:6 2263-2295
- Nofsinger, John. (3 ed) 2007. *The Psychology of Investing*. New York: Prentice Hall.
- Odean, Terrance. 1998a. "Are Investors Reluctant to Realize Their Losses?" *Journal of Finance* 53:5, 1775-1798.
- Odean, Terrance. 1998b. "Volume, Volatility, Price, and Profit When All Traders Are Above Average." *Journal of Finance* 53:6, 1887-1934.
- Odean, Terrance. 1999. "Do Investors Trade Too Much?" *American Economic Review* 89:5, 1279-1298.

- Rashes, Michael. 2001. "Massively Confused Investors Making Conspicuously Ignorant Choices, (MCI-MCIC)." *Journal of Finance* 56:5, 1911-1927.
- Sargent, Thomas. 1993. *Bounded Rationality in Macroeconomics*. New York, NY: Oxford University Press.
- Seasholes, Mark and Ning Zhu. 2008. "Is There Information in the Local Portfolio Choices of Individuals," working paper, University of California.
- Seru, Amit, Tyler Shumway and Noah Stoffman. 2009. "Learning by Trading." *Review of Finance Studies*, forthcoming.
- Shapira, Zur and Itzhak Venezia. 2001. "Patterns of Behavior of Professionally Managed and Independent Investors." *Journal of Banking and Finance* 25:8, 1573-87.
- Shefrin, Hersh and Meir Statman. 1984. "The Disposition to Sell Winners Too Early and Ride Losers Too Long: Theory and Evidence." *Journal of Finance* 40:3, 777-90.
- Weber, Martin and Colin Camerer. 1998. "The Disposition Effect in Securities Trading: An Experimental Analysis." *Journal of Economic Behavior and Organization* 33:2, 167-84.
- Zhu, Ning. 2005. "The Local Bias of Individual Investors, working paper, University of California, Davis.
- Zhu, Ning. 2007. "Search Costs and Household Choice between Direct and Delegated Portfolio Management." working paper, University of California, Davis.

ABOUT THE AUTHOR

Ning Zhu is an Associate Professor of Finance at University of California, Davis and a special term professor at Guanghua School of Management at Beijing University. Professor Zhu is an expert on behavioral finance, investments, and the Asian financial markets. He has published dozens of articles in leading journals in the financial economics, management and legal fields. In addition to his academic research, Professor Zhu helps asset management companies in a wide range of consulting projects. During his leave from the University of California in 2008, he implemented his research into practice and leads the quantitative strategies and portfolio advisory teams at Lehman Brothers and Nomura International in Hong Kong, the top ranked firm by leading institutional surveys. He commands extensive experience in designing portfolio and trading strategies and advising some of the largest institutional clients and internal proprietary traders. Professor Zhu received his B. Econ. from Beijing University, M.S. from Cornell University (NY), and Ph.D. from Yale University.