



An examination of the relationship between the disposition effect and gender, age, the traded security, and bull–bear market conditions



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ABSTRACT

We analyze how gender and age, internal characteristics of retail futures traders—one that remains fixed while the other changes over a lifetime—and the security being traded and bull–bear market conditions, two external factors, are related to the disposition effect by separately tracking their trade-by-trade transaction histories over a period of close to six years on the Taiwan Futures Exchange (TAIFEX). We show that women and mature traders, compared with their male and younger counterparts, exhibit a stronger disposition effect. The effect is also stronger among traders who trade financial-sector futures contracts than among those who trade electronic-sector futures contracts. We further demonstrate that a bear market sees a stronger disposition effect.

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1. Introduction

According to the Commodity Research Bureau¹ (CRB), fewer than 25% of all futures traders are successful. Surveying the top traders who consistently make hundreds of thousands—even millions of dollars—each year, CRB compiles “50 Rules of Futures Trading.” Among these rules, six are related to how to deal with unrealized gains and losses, and the most familiar ones are “cut your losses short” and “let profits run.”² Similarly, veteran futures practitioners advise that to be successful, traders need to control emotion and adhere to a trading plan. A major component of such a plan is to manage trading risk by establishing thresholds to limit losses and establishing objectives at which profits are to be taken. The simple risk management rules they attribute to a trader's overall profits are the same: “cutting losses and letting profits run.”

Examining investors in aggregate in various markets, many studies have documented that instead of following these well-known rules of successful trading, average investors behave just the opposite. They hold onto losses too long but realize gains too readily, i.e., they

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¹ <https://secure.barchart.com/crb/ebook.asp?orderid=50rules&ref=beta>.

² The other four include: “Isolate your trading from your desire for profit,” “Never add to a losing position,” “Avoid holding losing positions,” and “Learn to like losses.”

exhibit the disposition effect. More recently, several studies (Dhar and Zhu, 2006; Feng and Seasholes, 2005; Frino et al., 2004; Locke and Mann, 2005) go beyond the aggregate investor and show that differences in knowledge, ability, and sophistication lead to variations in the disposition effect among investors. We extend this research by tracking the trade-by-trade history of each individual retail trader on the Taiwan Futures Exchange (TAIFEX) from January 2003 to December 2007 and by conducting an in-depth examination of the variations in the disposition effect among traders and how such variations are related to internal biological characteristics such as gender, an enduring trait that remains fixed over a lifetime, and age, which changes over time. Despite being the two most basic individual characteristics, these factors have not yet been the center of analysis of the disposition effect.³ In sharp contrast, a vast literature in sociology, psychology, and experimental economics has been devoted to investigating the impact of gender and age on financial risk assessment (Hallahan et al., 2004), decision making, risk perception, preference, and tolerance, and numerous other issues.⁴ In addition to being the two most investigated factors in these studies, they have also been shown to be more important than the less-investigated education, income, wealth, and other environmental factors in determining investor behavior (Barnea et al., 2009).

In addition to examining internal factors, we further investigate whether and how external factors also play a role in the disposition effect. To motivate this investigation we again look to veteran futures traders. According to them, to be profitable, traders must have a trading plan and a major component of the plan is a risk management program which specifies how much money to risk on a trade and when to cut losses.⁵ Specifically, the exact amount of loss that a trader should tolerate before a position is closed depends on factors such as the amount of margin in the trader's account and the volatility of the product being traded. The greater the volatility the more risk is involved if one wants to carry the position through transitory price movements without being forced to exit the position prematurely. This advice suggests that volatility may be an external factor affecting how traders behave, potentially reflecting a behavioral bias such as the disposition effect. Unfortunately, we cannot explore the issue of margin due to lack of such information in our dataset. Adding trade-by-trade volatility on top of the already daunting task of trade-by-trade tracking also creates an insurmountable technical nightmare. As an alternative, we choose to examine how the security being traded and bull–bear market conditions,⁶ two volatility related external factors, are related to the disposition effect. We compare how traders vary in the trading of two different futures contracts that, as discussed in Section 2, have two distinct underlying assets—the electronic sector index versus financial sector index—with different characteristics. It's plausible that these two futures contracts attract different traders and through trading, the varying degrees of the disposition effect among the traders are revealed.

We further identify bull and bear market periods and investigate whether and how the disposition effect varies between the two market conditions based on the premise that the differences in market volatility—higher during bear markets than in bull markets (Cuñado et al., 2008)—potentially affect investors' behavior differently as evidenced in Kim and Nofsinger (2007).

This in-depth examination of both internal and external factors of the disposition effect contributes to the behavioral finance analogously to the studies on nature versus nurture in various areas in psychology. They conclude that human behavior is rarely determined solely by either nature—internal characteristics—or nurture—external factors. By examining both age and gender simultaneously, we shed light on the conflicting results in previous studies regarding whether older investors are more or less prone to the disposition effect.⁷ It is possible that the mixed findings may be due to the effect of gender that is not included and accounted for in the studies. Furthermore, while both are internal fundamental biological factors, gender is an innate and enduring characteristic that is fixed over the lifetime of an individual,⁸ age, on the other hand, changes with time and the aging process has been shown to be related to a decrease in risk tolerance attributable to biological changes in enzymes (e.g., Harlow and Brown, 1990). The simultaneous examination of both factors affords us a unique opportunity to explore whether behavior traits are indeed determined by enduring innate characteristics, whether they are also subject to change over time, and which factor exerts more influence. Furthermore, by being the first, as far as we know, to examine whether and how external factors such as securities being traded and bull–bear market conditions are linked to behavioral bias, we also add to the literature that external microstructural factors indeed matter in investor behavior.

Finally, with trade-by-trade tracking our analysis is free from the inherent limitations resulting from the assumptions imposed in many previous studies such as zero open interests by the end of the day (Locke and Mann, 2005) as well as choosing an arbitrary interval to assess gains and losses. More importantly, unlike previous studies that examine only a subset of investors in the market—such as those in a particular brokerage firm⁹—our sample includes all Taiwanese retail futures traders from all walks of life in the whole country, across all ages, and equally distributed between the genders. They represent very well the whole spectrum of the retail investors. Unlike institutional investors whose trades are complicated by agency relationships or hedging motives, they offer an ideal laboratory to study individual investors' behavior. These methodological and data advantages conceivably render our results more generalizable.

³ Feng and Seasholes (2005) include gender and age—in different brackets—that they consider to be related to sophistication in their estimates of hazard ratio and Dhar and Zhu (2006) include $\ln(\text{age})$ as a control variable in their regressions.

⁴ Studies regarding gender differences include the perception of risk associated with risky behaviors, various hazards, and dangerous activities (Boverie et al., 1995; Flynn et al., 1994; Spigner et al., 1993), risk preference (Croson and Gneezy, 2009; Eckel and Grossman, 2008), investment decisions and financial risk-taking behaviors (Bajtelsmit et al., 1999; Bernasek and Shwiff, 2001; Charness and Gneezy, 2007; Hallahan et al., 2004; Hibbert et al., 2008; Olivares et al., 2009; Sunden and Surette, 1998; Watson and McNaughton, 2007), and stock market participation and allocation of retirement assets (Campbell, 2006). Studies on age differences include risk tolerance (Chaulk et al., 2003; Cutler, 1995; Donkers and Soest, 1999; Fan and Xiao, 2006; Grable, 2000; Grable et al., 2004; Hallahan et al., 2004; McInish, 1982; Sunden and Surette, 1998; Van de Venter and Michayluk, 2009; Xiao and Anderson, 1997).

⁵ See "Developing a Trading Plan," by Rick Thachuk, *The Futures Magazine*, April 1, 2009.

⁶ We would like to thank the anonymous reviewer for suggesting that we investigate the bull–bear factor.

⁷ Dhar and Zhu (2006) and Korniotis and Kumar (2011) conclude that older investors exhibit a weaker disposition effect, while Feng and Seasholes (2005) show that the opposite is true.

⁸ With the exception of people who undergo a surgical sex change.

⁹ Dhar and Zhu (2006), Korniotis and Kumar (2011), and Barber and Odean (2001).

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