A Review on the Disposition Effect of Individual Investors

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Abstract

Disposition Effect refers to the phenomenon that investors tend to sell profitable stocks and continue to hold loss stocks. It is typical irrational behavior. Simultaneously, due to the limited professional knowledge of individual investors and their investment behavior is greatly affected by emotions, the disposition effect is evident in the investment process. The disposition effect belongs to the category of behavioral finance. Based on prospect theory, this paper explains the behavior deviation of individual investors in the capital market from an irrational perspective. Through the research on it, it is helpful for investors to understand their irrational behavior and guide the development of investment theory and practice.

Keywords

Disposition Effect; Individual Investors; Prospect Theory; Irrational Perspective.

1. Introduction

In the framework of traditional finance, people who participate in economic activities are rational. They have the characteristics of rationality, no emotion or credulity, which are called rational people. Under this premise, a set of modern traditional financial theories is formed using the analysis of general equilibrium theory and no-arbitrage theory. However, empirical research and financial practice are making progress. At the same time, financial marketization is also developing. Traditional financial theories are increasingly unable to obtain empirical evidence, and the assumption of a rational person has been questioned more and more. Economic phenomena need to seek new theoretical support. With the relaxation of the rational person hypothesis and the combination of psychological research results, behavioral finance will gradually develop. Among them, it is an important research direction of behavioral finance that individual investors deviate from rational people’s behavior in the financial market. Odean and his colleagues (1999) were early researchers in this field. He found that the average return determined by the asset pricing model in traditional finance and the actual investment return of individual investors in the financial market could not be well matched. The former was far higher than the latter; This phenomenon is in contradiction with the traditional theory that inefficient markets, investors will neither get excess returns nor excess losses. The main reason for this phenomenon is the disposition effect of individual investors in the financial market. Shefrin and Statman (1985)\textsuperscript{[1]}, based on the investment theory, combined with psychology, and from the irrational perspective of investors, the first to put forward the disposition effect, a phenomenon of "win or lose," that is, investors tend to sell profitable stocks and continue to hold loss stocks. Since then, the research on the disposition effect has been competing. Scholars at home and abroad have found that the disposition effect exists widely in all kinds of capital markets. At the same time, investors can be divided into individual investors and institutional investors. By contrast, individual investors’ professional knowledge is more limited, and their psychological emotions are easily affected by external factors. Therefore, there are many
studies at home and abroad to discuss the disposition effect of individual investors in the capital market.

This paper is mainly divided into three parts: the first part mainly includes the reason analysis of the disposition effect and the choice of reference point; the second part mainly introduces the research status of the disposition effect, including the measurement method, influencing factors, and the new treatment effect of the modern and contemporary capital market; the third part is based on the disposition effect for individual investors.

2. Theoretical Explanation

At present, scholars mainly use the prospect theory proposed by Kahneman et al. (1979) to explain the generation of the disposition effect. At the same time, mainstream studies believe that the generation of disposition effect also includes the theoretical explanation of psychological account, regret aversion, and self-control.

2.1. Prospect Theory

Prospect theory analyzes investor psychology as the breakthrough point, combines psychological research with economic research, and focuses on the analysis of investor's uncertain behavior decision-making. The main viewpoints of prospect theory are: first, the choice of reference point, when making decisions, investors pay attention to the results of profit and loss compared with the reference point, and refer to the amount of change rather than the absolute amount of final profit or loss; second, risk preference and loss aversion, prospect theory with the idea of marginal analysis, investors in the face of loss have risk pursuit psychology, in the face of profit occurrence have risk aversion psychology, at the same time, for each unit of profit and loss, the degree of investors to avoid loss is greater than the degree of profit preference. The "S-type" value curve can directly reflect the idea of prospect theory, as shown in the following figure:

![Figure 1. Value Function Diagram](image)

A simple example is used to further understand the framework model of foreground theory. Suppose you bought an asset at 500 and the current price is 550. There are two options, one is to sell the asset currently and get utility of v(50); Another is to continue to hold to the next period for sale, suppose the expected the next issue of the asset price is 500 or 600, and the possibility of the above two kinds of asset prices are equal. According to the concept of expected return, it can be calculated in the next to sell the asset to obtain the expected value of $1/2 \times U(0)$
+ 1/2 * U(100), based on prospect theory and value function, investors will choose the current sale of the assets for the current earnings. In the case of a loss, if an asset that was bought for 500 is now worth 450, then the utility from selling that asset in the current period would be U(-50). In this case, the asset price of the next period is predicted to be 400 or 500. The likelihood of the above two asset prices occurring is equal, so the expected value of the asset sold in the next period is 1/2*U(0)+1/2*U(-100). According to the prospect theory and value function, investors will choose to wait, implying that their asset prices will rebound in the future. However, if they sell in the current period, investors will psychologically think that they will admit their mistakes in investment decisions in the current period, but they are unwilling to admit.

Table 1. Application of prospect theory

<table>
<thead>
<tr>
<th>Case One(Gain)</th>
<th>Case Two(Loss)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buying</td>
<td>500</td>
</tr>
<tr>
<td>Current Price</td>
<td>550</td>
</tr>
<tr>
<td>Current Utility</td>
<td>+50</td>
</tr>
<tr>
<td>Next Price</td>
<td>1/2<em>500+1/2</em>600</td>
</tr>
<tr>
<td>Next Utility</td>
<td>+50</td>
</tr>
<tr>
<td>Current selection</td>
<td>Sell</td>
</tr>
<tr>
<td></td>
<td>450</td>
</tr>
<tr>
<td></td>
<td>-50</td>
</tr>
<tr>
<td></td>
<td>1/2<em>500+1/2</em>400</td>
</tr>
<tr>
<td></td>
<td>-50</td>
</tr>
<tr>
<td></td>
<td>Hold</td>
</tr>
</tbody>
</table>

2.2. Other Factors

In addition to the prospect theory, there are other theoretical explanations for the disposition effect, such as mental accounting, regret aversion and self-control. Mental accounting first proposed by Richard Thaler in 1980, refers to the investors put money in the account of the different in between each account can't complement each other, treat each kind of funds have different attitude and the propensity to consume. Shefrin (1985) argue that investors for each new investment assets, will build a new mental accounting for the assets, and will be the asset of the current price comparing with the initial price, investment, they only focus on profit and loss of the asset, not maximize the profitability of the portfolio as a whole. Regret aversion refers to that investors will feel regret for investing in an asset when they sell it at a loss, and this regret is equivalent to admitting their investment mistakes, which will bring great disutility. Self-control means that investors will dispose of the loss-making assets under the influence of an exogenous control factor, thus weakening the disposition effect.

2.3. Reference Price

It is believed that the carrier of value is the change of wealth rather than the state of wealth at a particular time point. Therefore, the choice of reference price is one of the research focuses on the disposition effect. As for reference price choice, foreign scholars have carried out some research based on their capital market, but there are few domestic-related types of research. Foreign studies mainly focus on the setting of reference price and the formation of the reference price. In terms of reference price setting, most studies take the average price of assets purchased by investors as the reference price. In empirical research, we use different reference prices to determine the reference price using questionnaire data or simulation experimental data. Baucells and his colleagues (2011) found that investors’ decision-making will be affected by the reference price in the simulation experiment. The purchase price, current price, average price, maximum price, and minimum price of assets can all be used as reference prices to bring influence. When Hwang and Grinblatt studied the relationship between disposition effect and momentum effect, the reference price was set as the highest price in Recent 52 weeks and the weighted average price in 260 weeks. In terms of reference price formation, Kliger (2008) and others used analytical methods to predict data and empirically studied the influence of stock trading volume and quarterly income reports on reference price form.
formation prices following year's research found that stock investors' reference price is affected by the significant events of listed companies, which is not a fixed value. Domestic scholars have also carried out a series of studies on the reference price. Zhou Yuegang and others (2011)[5], based on the perspective of disposition effect, studied the distribution characteristics of reference price and made an empirical analysis of stock price's prediction ability. Chi Lixu and others[6] (2011), based on the dynamic reference price calculated by the first in first out method and the historical highest or lowest price as the reference price, analyzed the impact of reference price on investor sentiment. This paper took 1.5 times of IPO price as investors' psychological reference price to establish the relationship between disposition effect and IPO. Ren De Ping Ping[7](2013), through empirical analysis, found that using the weighted moving average price of the stock in recent five weeks as the reference price of China's stock market, the research on the disposition effect is better.

3. Research status

3.1. Measurement of disposition effect

3.1.1. Selling profit and loss ratio method

Odean proposes this method. By calculating the ratio of selling book loss assets and selling book profit assets, two methods are classified according to the situation of profit and loss. The first method is divided into the number of profitable assets and the number of lost assets, and the second is divided into four categories: realized profit, realized loss, unrealized profit, and unrealized loss; according to the latter classification, RG is defined as the number of realized profits, PG is the number of realized profits, RL is the number of realized losses, PL is the number of unrealized losses, PGR is the proportion of profitable stocks sold in the sample period, and PLR is the proportion of loss shares sold in the sample period.

\[
PGR = \frac{RG}{RG + PG} \\
PLR = \frac{RL + PL}{RL + PL} \\
D = PGR - PLR
\]

When D is more significant than zero, it indicates a disposition effect, and the larger the value, the stronger the disposition effect. When D is less than zero, it means that there is no disposition effect. Li Xuefeng (2013) and Wu Jiawei (2020) used this method to measure the disposition effect.

3.1.2. Trading cycle time ratio

This method calculates the holding time of the loss stock and the profit stock, analyzes the disposition effect, calculates the trading cycle of unit assets according to the experimental data or transaction data, respectively counts the number of profit and loss assets, and then calculates the difference between the holding time of the loss stock and the profit stock. If the result is more significant than zero, it indicates that there is a disposition effect. Otherwise, there is no such effect. Due to the difficulty of data collection, this method has low popularity.

3.1.3. Survival analysis model

The survival analysis model was first applied in the field of clinical medical statistics. To introduce the concepts of survival time and survival state into the economic and financial field research, it is necessary to define a termination state. Simultaneously, the whole duration from the beginning of investment to the occurrence of the termination event is included in the model as a time variable. Compared with the traditional economic model, the model forms two independent variables. The disposition effect was studied by analyzing the factors affecting the duration. Domestic scholars based on the Cox survival analysis model to study the disposition
effect are developed in recent years, mainly used in the research of fund market and margin trading market. Wu Yanran (2016) and Xiao Lin (2018) respectively studied the disposition effect and individual differences of individual investors in the fund market and the margin trading market. Liu Xin and others (2019) introduced the survival analysis model in the study of the disposition effect and empirically demonstrated the influencing factors of the fund market's disposition effect.

3.2. Influencing factors

3.2.1. Investor sentiment

Compared with institutional investors, individual investors' capital strength is weak. China's capital market is more special, and there are more retail investors. More unique investors are the leading investors in the market. The impact of individual investor sentiment on the market is closely related to individual investors' disposition effect. Investors' psychological reference point is affected by investor sentiment, which shows the change of reference price, and then affects the disposition effect. To study the impact of investor sentiment on the disposition effect, we need to construct a series of indicators to quantify the subjective factor. Chi Lixu and others found that individual investors are more likely to have pessimism. The higher the cost of holding stocks (including the opportunity cost), the lower the investor's sentiment, but not because of the high stock price. Wu Jiawei and others believe that the disposition effect is negatively related to investor sentiment. The difficulty of stock valuation becomes more excellent and more significant under investor sentiment, thus weakening the disposition effect.

3.2.2. Investor characteristics

Domestic and foreign researchers have researched the impact of investors' differences on the disposition effect. Domestic Wu Yanran and Wang Zhiqiang have made contributions to the relevant research. Through different sample data and different perspectives, some common conclusions are formed. The gender, investment experience, and transaction type of investors significantly impact the disposition effect. It is considered that under the control variables, the disposition effect of female investors is more robust than that of male investors, and the disposition effect of investors with rich investment experience is weak. However, in terms of the impact of age on the disposition effect, Wu Yanran and his colleagues thought that the young investors had a more substantial disposition effect, while Wang Zhiqiang and his colleagues (2016) thought that the impact of investor age on the disposition effect was not significant.

3.2.3. Different markets

Studies at home and abroad show that the stock market, fund market, futures market, and real estate market have different disposition effect degrees, and all have their characteristics. The stock market's disposition effect is mainly based on loss aversion, while the stock price reversal effect and the existence of the psychological account lead to the disposition effect of the fund market and the futures market, respectively. Because of the low liquidity of the real estate, the investors have the disposition effect based on the real estate's expectation.

3.3. New disposition effect

Early studies on the disposition effect believe that investors' willingness to buy and sell an asset changes monotonically with the increase of income. However, with further study of the capital market, scholars found that the disposition effect is not a monotonic function but an asymmetric V-shaped function. Using the Chinese A-share market, the paper empirically proves that the disposition effect of Chinese stock investors is an asymmetric V-shaped function. From the stock loss state to the income state, with the increase of investors' investment income, the willingness to sell first decreases and then increases. Compared with the reference point, the
marginal propensity to sell the profit part is greater than that of the loss part, which is consistent with the disposition effect's nature.

![Figure 2](image.png)

**Figure 2.** Asymmetric V-shaped Disposition Effect function

4. **Investment advice**

4.1. **Good emotional management**

The disposition effect's existence shows that investors' investment behavior is closely related to their psychological emotions. The capital flow in the capital market is enormous, and the profits and losses within a reasonable range for some time are everyday phenomena. To do an excellent job of emotional management is to deal with the changes in profits and losses in the market. Moreover, should not be blinded by the profit and loss phenomenon itself. Furthermore, adhere to value investment when ensuring reasonable expectations. We should pay attention to the value of assets themselves, conduct rational fundamental analysis, pay attention to the trend of asset prices, analyze investment from a more long-term perspective, and reduce the impact of invalid external information on their own emotions.

4.2. **Learn professional knowledge well**

The empirical study shows that institutional investors' disposition effect is weaker than that of individual investors, and the critical reason is the lack of theoretical knowledge of individual investors. Therefore, in modern society, with the developed Internet, investors can learn the professional knowledge of securities investment through various channels, better combine theoretical knowledge with investment strategies in the actual investment process, rationally analyze the market trend and make rational decisions.

4.3. **Strengthen risk management**

Individual investors should rationally use their professional knowledge to identify market risks correctly, and at the same time, assess their risk tolerance. Based on doing an excellent job in emotional management, consolidating theoretical foundation, and rich investment experience, individual investors should assess their demand levels for asset profitability, capital liquidity, and capital security. Moreover, strengthen risk management based on their actual situation. Choose value assets suitable for their risk tolerance, diversify investment, and make value investment based on ensuring the quality of life.

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References


