



Repurchase behavior of individual investors, sophistication and regret[☆]



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ABSTRACT

This study uses a database of over 6 million trades from a large European brokerage house to investigate the stock repurchase behavior of individual investors from 1999 to 2006. Running survival analysis techniques, we show at an individual level that the duration between a sale and a repurchase is shorter when the investor has had a positive experience with the stock or when the stock has lost value since being sold. More sophisticated investors are significantly less prone to this behavior. Our findings emphasize the importance of regret in financial decisions. Public and private information, tax considerations and contrarian strategy do not drive repurchase behavior.

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1. Introduction

Over the last decades, researchers in behavioral finance have carefully examined the drivers of purchase decisions made by investors. It is now clearly established that investors tend to buy stocks that grab their attention,¹ and make investments in familiar stocks more likely.² A clearer picture of the portfolio performance of individual investors can be obtained by pinpointing the reasons behind investor's decision to repurchase a stock that they have previously sold, yet attention has only been paid to these preferences recently. Indeed, Nofsinger and Varma (2013) argue that investors would gain more from moving to more profitable investments instead of investing in a stock they held in the past.

Contrary to standard finance models where financial choices should be based on thoughtful expectations of future stock prices, repurchase behavior is affected by the memory associated with past sales (Strahilevitz et al., 2011; Nofsinger and Varma, 2013). In this paper, we highlight the heterogeneity observed in the repurchase behavior of individual investors. Based on a survival model, our study stresses the role that investor attributes such as sophistication play in stock selection. Our analysis of over 6 million trades realized by French individual investors makes this the largest study examining the repurchase behavior of individual investors in a European context. We show that more sophisticated investors are less influenced by previous experience when they decide to invest in a stock.

Strahilevitz et al. (2011) have recently evidenced that investors prefer to repurchase stocks they have previously sold for a gain, and repurchase stocks that have lost value since being sold. From a methodological point of view, these authors evaluate the frequency at which investors repurchase prior winners and losers in relation to the opportunities they have to repurchase them. These rates of repurchase give satisfactory results at the aggregate level but are not efficient at the individual level. Another drawback of this method is its inability to pinpoint potential heterogeneity in behavior across investors. Our approach is close to a logit regression and addresses these drawbacks, providing a statistical model of how stocks are typically repurchased. Our research design enables us to evaluate how change in independent variables such as investor sophistication can affect the duration between a sale and a repurchase.

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¹ Stocks in the news, stocks experiencing abnormal volumes, or extreme-performance stocks (Barber and Odean, 2008). This attention-based buying behavior is confirmed for other attention-grabbing events, such as stocks hitting upper price limits (Seasholes and Wu, 2007), dividend announcements (Graham and Kumar, 2006) and earnings announcements (Lee, 1992).

² See Huberman (2001) and Grinblatt and Keloharju (2001).

An investor's level of sophistication reflects his expertise using financial instruments and how well he knows the financial market. Numerous studies report that investor sophistication helps to reduce some biases such as the disposition effect, i.e., the tendency to sell winners more readily than losers (Calvet et al., 2009; Dhar and Zhu, 2006; Grinblatt et al., 2011). Along the same lines, sophisticated investors have a lower tendency to invest in their company's stocks (Agnew, 2006; Kimball and Shumway, 2010) and are less prone to underdiversification (Calvet et al., 2009; Goetzmann and Kumar, 2008).³ However, when sophisticated investors are endowed with informational advantages, they choose to hold more concentrated portfolios and to favor local stocks, resulting in better performance (Korniotis and Kumar, 2013). Based on these results, we postulate that sophisticated investors are likely to be skilled in gathering and interpreting information. Additionally, we assume that sophistication is correlated with a better understanding of stock investments.

Sociodemographic variables such as income, education level, age, place of living or family size are generally used to identify sophisticated investors (Calvet et al., 2009; Dhar and Zhu, 2006). However the use of such indirect measures implies assumptions regarding the access to information, the processing of information and the financial knowledge of the wealthier, older, well-educated and urban investors. Age, environment and education are associated with cognitive skills (Cagney and Lauderdale, 2002; Holtzman et al., 2004; Christelis et al., 2010), which, in turn, are often used as criteria to identify sophisticated investors (Grinblatt et al., 2011; Korniotis and Kumar, 2013; Christelis et al., 2010). Sophistication can also be measured using direct indicators such as the trading of complex instruments or the tendency to diversify, to invest in foreign stocks, and to short sell (Korniotis and Kumar, 2013; Feng and Seasholes, 2005; Kimball and Shumway, 2010). These metrics reflect higher skills and a greater understanding of financial markets. Along the same lines, trading experience, measured by the number of trades placed by the investor or the length of time elapsed since the opening of the account, are other possible dynamic indicators of sophistication. The direct evaluation of sophistication can also be carried out using surveys that test the financial literacy of agents.

Based on the abovementioned works, we measure sophistication using foreign stock trading and diversification levels. We add a third measure based on a specific French taxation feature, i.e., the holding of multiple accounts to place trades. Investors trading on a traditional account and a tax-free account show sophistication by exploiting the flexibility of the former and the tax exoneration of the latter.

This paper makes several novel contributions to existing literature describing the behavior of individual investors. First, we use survival analysis to demonstrate that repurchase preferences exist at an individual level, thus extending the work of Strahilevitz et al. (2011). Indeed, the time between a sale and a repurchase is accelerated by 3.29% following the sale of the stock for a profit. At the same time, an average duration of 49 days until repurchase is observed for stocks with prices that had declined since the sale, i.e., the repurchase occurs more than 11 days before that observed between the sale and repurchase of stocks with prices that had increased since the sale. These results obtained from our French sample corroborate previous results obtained for U.S. households at the aggregate level (Strahilevitz et al., 2011).

³ The evidence is mixed when considering professional investors, who, by definition, are expected to be sophisticated. Kaustia et al. (2008) demonstrate that financial market professionals show a much smaller anchoring bias in their long-term stock return expectations than university students, and Grinblatt and Keloharju (2000) show that foreign institutional investors are less prone to the home bias. In contrast, Frazzini (2006) shows that U.S. mutual funds exhibit the disposition effect with the same order of magnitude as individual investors.

Second, our individual analysis makes it possible to consider existing heterogeneity in behavior. We do not find any tendency in sophisticated investors to repurchase stocks previously sold for a gain. For instance, for an investor who trades on two accounts and has sold a stock for a profit, the time until repurchase is decelerated by 5.6%. For most sophisticated investors, the time between the sale and the repurchase is decelerated by 15%. We however do observe that although sophistication reduces the tendency to repurchase stocks whose price has decreased since the sale, it does not eliminate it. Indeed, time until repurchase by an investor who satisfies the three sophistication variables is decreased by 5 days. By contrast, time until repurchase is decreased by 17 days for an investor who does not satisfy any of the sophistication variables.

Third, we contribute to the debate on the determinants of repurchase patterns. In their study of investor preference to repurchase stocks sold for a gain, Nofsinger and Varma (2013) find that the recency of stock sales plays a crucial role in this behavior, and dominates the impact of prior profitability. The authors show that the repurchasing decision for a stock appears to be mostly dependent on the timing of trades of other stocks. Indeed, the recency of another stocks sale decreases the propensity to repurchase a given stock by 23%. Nofsinger and Varma (2013) explain that investors "often confuse their ease in recalling information about a stock with its superiority". We test other potential drivers for repurchase preferences, and find that public information-based trading, private information-based trading or tax motivations do not explain the repurchase patterns. Though these three determinants do have an impact on the duration until repurchase, this impact is not sufficiently strong to overcome the time acceleration generated when the stock has been sold for a gain or has decreased in value since the sale. Moreover, investor preference for repurchasing stocks whose price has declined since the previous sale cannot be explained by the use of contrarian strategy, as we find that investors rather apply a momentum strategy in their purchases. The cumulative market-adjusted returns before purchase are strongly positive, proving that the preference for stocks with poor recent performances specifically concerns stocks the investor has previously owned and sold. We therefore reject the idea that standard motivations could explain these preferences and follow (Strahilevitz et al., 2011), who explain these patterns by focusing on the role of emotions. We believe that such behavior is primarily motivated by an investor's desire to avoid regret.

The rest of the paper is organized as follows. Section 2 describes the data and the methodology. We discuss the results in Section 3. In Section 4, we consider rational and behavioral drivers for the behavior. Section 5 provides our conclusions.

2. Data and methodology

We first present the sample before moving to a detailed presentation of our methodology.

2.1. Data

The main data are provided by the leading European specialist in online savings and brokerage for individuals. This firm has over one million clients in Germany, France and Spain. We obtained the trading records of 84,500 French individual investors during the period from 1999 to 2006, which consist of 4,232,512 buy trades and 3,839,504 sell trades. The sample contains 2,491 stocks that were traded at least once during the period. The price data come from two sources: Eurofidai⁴ for stocks traded on Euronext, and Bloomberg for the other stocks. Among the 2491 stocks, 1191 are

⁴ European financial data institute: <https://www.eurofidai.org>.

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