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False discoveries in style timing of Chinese mutual funds

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ABSTRACT

This paper examines the daily style timing of actively managed Chinese stock mutual funds from July 2002 through December 2013 by adopting the false discovery rate (FDR). We find evidence in favor of mutual funds being able to time the market. Our results indicate that mutual fund managers do not possess size, value or momentum-based timing skills. Concerning the relation between fund characteristics and style timing, we find that expense and turnover are positively associated with market timing and value timing but negatively associated with momentum timing, which is likely to be attributable to different investment objectives. In addition, we examine market timing skill persistence by controlling the FDR and find that Chinese stock mutual funds are able to exhibit market timing persistence.

1. Introduction

Levis and Liodakis (1999) and Desrosiers et al. (2004) demonstrate that an active style timer might provide additional returns for investors by adjusting the portfolio's risk exposure to different style segments. However, many studies on the timing ability of mutual fund managers only focus on the market and do not consider the other popular investment styles: size, value, and momentum. These early studies generally adopt the TM (Treynor and Mazuy, 1966) and HM (Henriksson and Merton, 1981) timing models to explore the stock market timing skill of fund managers.[1] One notable exception is the work of Swinkels and Tjong-A-Tjoe (2007), who attempt to use the TM and HM models to assess fund manager market timing, size timing, value timing, and momentum timing separately. Their results show that US mutual funds have market timing and can predict the direction of the value and momentum but lack size timing ability. Contrary to Swinkels and Tjong-A-Tjoe (2007), Chen et al. (2013) integrate the four timing factors into TM and HM models to examine four different timing skills simultaneously. They find that only growth funds investing mainly in growth stocks can exhibit persistent value timing ability in the USA. As emphasized by Chen et al. (2013), Swinkels and Tjong-A-Tjoe (2007) consider the separate timing abilities but ignore the interrelation of different timing factors, where other timing abilities may be falsely identified as market timing ability. Therefore, this study extends the style timing models used in Chen et al. (2013) to examine whether Chinese stock mutual funds are able to time the four investment styles in Chinese stock market based on daily data. More specifically, we investigate how many style timing funds exhibit true timing skill rather than good luck.

Recently, there have been a few studies focusing on how to distinguish skill from luck for individual funds. Kosowski et al. (2006), Cuthbertson et al. (2008), and Fama and French (2010) conduct a cross-sectional bootstrap method to determine whether mutual fund managers are genuinely skilled by comparing simulated luck distributions and actual performance distributions. This

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[1] See, e.g., Chang and Lewellen (1984), Lee and Rahman (1990), Chen et al. (1992), Ferson and Schadt (1996), Goetzmann et al. (2000), Bollen and Busse (2001), Jiang et al. (2007) for the US mutual funds as well as Fletcher (1995), Leger (1997), Bangassa (1999) for the UK unit trusts. These papers show little evidence of market timing ability in mutual funds.

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method takes into consideration the non-normality of fund returns. Barras et al. (2010) use the false discovery rate (FDR) to estimate true fund performance in a multiple hypothesis setting. The FDR method can determine how many funds are truly skilled by controlling the proportion of lucky funds. In addition, Barras et al. (2010) demonstrate that controlling the false discovery rate considerably enhances the ability to detect the few funds with persistent performance. Therefore, we apply the FDR method to examine whether Chinese stock mutual funds have true style timing skills.

Most studies on the FDR method focused on stock selection (see, e.g., Barras et al., 2010; Cuthbertson et al., 2012; Cuthbertson and Nitzsche, 2013; Kim et al., 2014; Kamil et al., 2014). However, little is known about style timing of mutual funds. By applying the FDR method, Cuthbertson and Nitzsche (2013) document that a small proportion of funds exhibit true market timing, which to some extent improves the stock selection of German stock mutual funds. Additionally, Kim et al. (2014) provide strong evidence that half of market timers are truly skilled among Australian managed funds. In addition, Kim and In (2012) find that US mutual funds have a relatively low FDR in volatility timing and construct the FDR target portfolios to evaluate the out-of-sample performance of volatility timing funds. Nevertheless, we argue that in addition to market timing, an active mutual fund manager might be concerned with other timing skills.

Monthly returns are often used in the studies on mutual fund performance (for a survey, see, Cuthbertson et al., 2010), while daily returns, as the high-frequency data, seem to more efficiently capture the timing ability of fund managers. As shown by Goetzmann et al. (2000), rather than on a monthly basis, skilled timing funds might more frequently adjust their portfolios' market exposure. Bollen and Busse (2001) indicate that daily returns have higher explanatory power than monthly returns by comparing the daily and monthly market timing ability of fund managers. Dimson and Jackson (2001) suggest that high-frequency data monitor extreme performance more easily than low-frequency data. Thus, we use daily returns to highlight the fact that style timing managers rebalance their portfolios on a daily basis.

Since the first open-ended fund launched in September 2001, the Chinese mutual fund market has grown at a rapid pace in a relatively short period of time, and the Chinese stock market has been hugely volatile, especially in the crisis (see, e.g., Tang et al., 2012; Jun et al., 2014). Thus, as institutional investors, Chinese mutual funds provide an ideal environment for examining whether their managers are able to time the volatile stock market. In addition, sophisticated institutional investors are potentially subject to less behavioral biases, such as disposition effect, overconfidence, representativeness bias, and herding, relative to individual investors who dominate Chinese stock transactions (see, e.g., Chen et al., 2007; Tan et al., 2008; X. Chen et al., 2010). To the extent that the wrong reaction to information and irrational preferences of individual investors result in the predictability of the stock market, this implies that Chinese stock mutual funds have a greater information advantage to predict future returns of the factors that affect stock market returns. In the four-factor model, the market factor has a relatively high average return and variance during the period analyzed, which appears to suggest that Chinese stock mutual funds have an incentive to better time the market than the other styles.

Using a sample from July 1, 2002 through December 31, 2013 of 330 actively managed Chinese stock mutual funds, We find that a sizable proportion of the funds have significant market timing ability at the 5% level. However, there is no significant evidence of successful size timing, value timing, and momentum timing. These results are unchanged even after controlling for illiquid holdings and volatility timing. To determine what proportion of significant funds are false discoveries, we estimate the proportions of truly skilled and unskilled timing funds using the FDR method. After taking into account the FDR, we still find at least 10% of the funds having true market timing skill. No other style timing skills are observed. In addition, the majority of our funds exhibit zero timing skills, which is consistent with Berk and Green (2004), who suggest that skilled funds gradually lose any information advantage over the long term with increased competition from the mutual fund industry.

Examining style timing according to investment objectives shows that growth funds perform better than other funds in terms of market timing and value timing, while balance funds time the momentum better than other funds. We also examine the relationship between various fund characteristics and style timing. We find that fund characteristics have an insignificant effect on size timing but not other timing skills. It is noteworthy that fund expense and turnover are positively related to market timing and value timing but negatively related to momentum timing, which may be due to different investment objectives. Finally, we test fund manager market timing persistence by controlling the FDR and find that market timing skill is persistent.

The rest of this paper proceeds as follows. Section 2 explains the method adopted. Section 3 discusses the data and presents empirical results. Finally, Section 4 concludes.

2. Method

2.1. Style timing models

The Carhart (1997) four-factor model with size, value and momentum factors has been demonstrated to be capable of capturing the time variations of mutual fund returns and risk premium in the US and UK market, but little work has been done to analyze the performance of Chinese mutual funds despite their enormous growth over the past 10 years. Li and Lin (2011) use the Fama and French (1993) three-factor model to better explain the performance of Chinese mutual funds over the period from 2003 through 2008 relative to the single-factor model. Naughton et al. (2008) and Pan et al. (2013) offer evidence of substantial momentum profits in the Chinese stock market. Thus, to examine style timing of Chinese mutual funds, we use the four-factor TM and HM models of Chen et al. (2013) as our baseline models:

$$r_{i,t} = \alpha_i + \beta_{1,i} r_{m,t} + \beta_{2,i} r_{smb,t} + \beta_{3,i} r_{hml,t} + \beta_{4,i} r_{mom,t} + \delta_{1,i} r_{m,t}^2 + \delta_{2,i} r_{smb,t}^2 + \delta_{3,i} r_{hml,t}^2 + \delta_{4,i} r_{mom,t}^2 + \varepsilon_{i,t} \quad (1)$$