Investor sentiment and the predictability of asset returns: Evidence from China

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ABSTRACT

In contrast to previous studies, we redefine the category of "rationality" from the perspective of investors' pursuit for wealth maximization. Using the data from Chinese stock market, this paper studies the impact of rational and irrational sentiment on asset returns from short-term to long-run. We find that irrational sentiment has stable positive predictability on the future returns in short term while it is a reverse indicator in the long run. Meanwhile, the rational sentiment accurately forecasts both the future short-term and long-run returns. Our findings indicate that the predictability of investor sentiment on returns is closely related to time interval chosen in research and the level of feedback between investor sentiment and asset prices.

Keywords: rational sentiment, irrational sentiment, predictability of asset returns
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INTRODUCTION

Traditional theories insist that asset prices should not be affected by investor sentiment, because individuals commit independently and rational arbitrageurs are ready to offset the asset mispricing. However, dozens of empirical evidences suggest that investors are plagued by cognitive biases and their irrational behaviors are systematically correlated, which indicates that the asset price errors can't be eliminated by rational arbitrageurs for the limits of arbitrage (De Long *et al.*, 1990a; Barberis, Shleifer & Wurgler, 2005; Baker & Wurgler, 2006, 2007; Kumar & Lee, 2006). It is widely accepted that investor sentiment is an important systemic risk factor that should be considered in asset pricing models. Then, we do not only concern how asset prices are influenced by investor sentiment, but also pay attention to whether investor sentiment has predictability of future returns.

Investor sentiment, firstly, contains rational expectations of fundamentals through which they want to pry the changes of asset prices. Secondly, it represents the cognitive biases when investors process market information, that is, they may both exhibit irrational expectation of fundamental changes and selectively pay attention to the information caters to their preference. Finally, investor sentiment also reflects investors' bullish or bearish expectations of asset prices which are affected by market noises. Just as Baker & Wurgler (2006) mention that investor sentiment, mainly stands for the investors' subjective expectations of future asset prices, is difficult to be measured directly and accurately in empirical researches. Therefore, majority of previous studies focus on finding an effective way to measure investor sentiment and testing its impact on asset prices. Two popular methods are often used to solve this problem: direct survey data (Solt & Statman, 1988; Schmeling, 2007) and indirect market indicators (Neal & Wheatley 1998; Baker & Wurgler, 2006, 2007; Feldman, 2010). Since the data from investor survey may be affected by the breadth of the survey sample and "the gap between how people respond to a survey and how they actually behave", the accuracy of investor sentiment is often questionable when we use survey data. Compared to the former one, the latter one is more widely used in empirical researches due to its high data availability and low limitation of sample size.

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The efficient market hypothesis declares that stock prices which are likely to follow random walk process are not predictable. However, a large number of financial professionals are keen to find outperformed investment strategy to beat the market. Empirical studies show that asset prices are somewhat predictable in the real market. For example, Campbell and Shiller (2001) find that dividend-price ratio positively forecasts future asset prices in the long run. After the stock market experiences bull or bearish for a long time, the dividend-price ratio will be at extreme level by historical standards, which can't last forever. Therefore, we can observe that the main stock indexes exhibit a mean-reversion at a certain period worldwide[①], though we can't accurately predict when it occurs. The mean-reversion doesn't casually happen, but a common phenomenon, because a large number of investors overreact to market information, which leads to the overshooting of asset prices.

In the short term, the demand of risky assets increases when more and more investors become optimistic. As the existence of arbitrageurs, the asset prices won't be affected by investor sentiment shocks. So, investor sentiment has no predict power on the short-term changes of asset prices (Brown & Cliff, 2004, 2005; Feldman, 2010). However, in the long run, the risk of arbitrage becomes higher than that in the short term. Thus, though the market is overvalued, an arbitrageur may be unwilling to take a short position because he fears the asset prices will become more overvalued before reverting to its intrinsic value. Therefore, over long horizons, the high sentiment will lead to the overvaluation of asset price and low long-run returns, which indicates that investor sentiment is a reverse indicator of asset long-run returns (Fisher & Statman, 2000; Brown & Cliff, 2005). However, Schmeling (2007) points out that institutional and individual sentiment seem to represent smart money and dumb money respectively, because the institutional sentiment has correct expectation of market returns over medium horizons while the individual sentiment is a consistently reverse indicator of market returns. Feldman (2010) builds a perceived loss index with mutual fund redemption data and finds that the index has significant predictive power in forecasting both the medium and long-term horizons of asset returns (especially for 1-2 years horizons). Affected by the loss aversion, individual investors become more pessimistic and pull their money out of the fund when they have experienced losses. Therefore, fund managers begin to sell their stocks for redemption pressure, and the asset prices will fall further, which lowers the investors' performance in the future. We can find there is a significant positive feedback between investor sentiment and asset prices.

Compared with the investor sentiment indexes proposed by Schmeling (2007), we use market indirect indicators which are easier to collect to construct sentiment indexes and focus on the predictability of investor sentiment on market returns. Another related research is Verma & Verma (2007), who run regressions of a series of macroeconomic variables on sentiment proxy to separate irrational sentiment from rational sentiment. Specifically, the part explained by fundamentals is referred as rational sentiment, while the remainder is referred as irrational sentiment[②]. Although we discriminate rational and irrational sentiment in the following research, our paper is distinguished from Verma & Verma as follows: Firstly, we focus on the predictability of investor rational and irrational sentiment on asset return, while they mainly study the relationship between investor sentiment and asset prices volatility. Secondly, Verma & Verma define rational sentiment based on whether it can be explained by fundamentals. However, we believe that this definition is biased. Hence, we propose a new way to differentiate rational and irrational sentiment. The difference between our work and existing ones is that we don't connect rationality with fundamentals, but giving a new definition from the perspective of investors' pursuit for wealth maximization, which better reflects the characteristics of investors' rationality and irrationality.

Investor sentiment, expressed in their expectations of future prices, is forward looking, whereas the part of sentiment proxy that can be explained by fundamentals is mostly backward looking or merely reflects current fundamentals. However, there is no guarantee that the investors can make correct expectations on future returns even if the future fundamentals can be accurately predicted, because the market prices of assets may deviate from their intrinsic value due to the demand shocks of noise traders. On the contrary, smart money in the market can take advantage of the irrational behaviors of noise traders and gain higher returns. Their investment strategies are "to beat the gun", rather than are completely based on the fundamentals (De Long *et al.*, 1990b). Therefore, we don't categorize investor sentiment as "rational" or "irrational" associating with fundamentals, but redefine investor rational and irrational sentiment as follows: rational sentiment reflects "smart money", in contrast, irrational sentiment reflects the "dumb money". The method we use to measure investor sentiment is similar to the one used by Baker & Wurgler (BW, 2006, 2007), who try to extract the common factors of market indirect indicators through principal component analysis. The major difference between our research and BW is that we define different principal components as the proxies of investor rational and irrational sentiment according to the economic implications implied by each

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[①] Such as, Dow Jones Indexes and S&P 500 Index, every 3-5 years
[②] In order to control for the influence of fundamentals, Baker & Wurgler (2006), and Kumar & Lee (2006) use regressions of a series of macroeconomic variables on sentiment proxy to purify single sentiment proxies.

principal component. Then, we study the predictability of rational and irrational sentiment on future asset prices and test the stability of our empirical results.

Our empirical results show that: firstly, in the Chinese stock market, for the limits of short sales and the existence of numerous high speculative individual investors, the asset prices are significantly affected by investor sentiment. Inconsistent with the existing empirical results that focus on the mature stock markets (Brown & Cliff, 2005; Feldman, 2010), our findings prove that rational and irrational sentiment have predictive power on both subsequent near-term and long-run returns in China. Secondly, irrational sentiment reflects noise trader risk. In the short term, because of the effect of price pressure (De Long *et al.*, 1990a), irrational sentiment has positive impacts on asset returns. Over a long horizon, the asset prices will be overvalued for continuous optimism (pessimism) of noise traders. Therefore, in the long term, irrational sentiment is a contrarian indicator of future returns. Finally, as rational sentiment stands for the correct expectations of smart investors, it has positive predictive power on both future short-term and long-term returns.

The rest of this paper is organized as follows: Section II describes the motivation for our research, and gives a more detailed discussion on rational and irrational sentiment. Section III examines the predictability of rational and irrational emotions on the future returns; Section VII concludes the paper.

2. Motivation

Considering that, in the real market, full with uncertainty, there is no widely accepted asset pricing model that can tell investors the accurate price of a risky asset, it is difficult for investors to precisely value risky assets when they make investment decisions, even if the investors put lots of efforts to analyze the market information. Therefore, we believe that the asset prices, at which a given investor is willing to buy, should not be limited to the association with their intrinsic values, more importantly, related to investors' subjective expectations of the future prices.

According to the investors' cognitive ability of the fundamentals and market environment, we divide investors into two groups: smart investors and noise traders. Keynes (1936) points out that professional investors can outperform the public because they are able to forecast changes in the conventional basis of valuation a short time ahead of the general public. He says: "The actual, private object of the most skilled investment today is "to beat the gun", as the Americans so well express it, to outwit the crowd, and to pass the bad, or depreciating, half-crown to the other fellow." Therefore, smart investors not only concern about the changes of fundamentals, but also are ready to take advantage of the systematic mistakes of noise traders (De Long *et al.*, 1990b). We define the part of investor sentiment that correctly predicts future returns and reflects "smart money" as rational sentiment. Rational sentiment does not only reflect the correct expectations of smart investors on fundamentals, but also the ability of smart investor to foresee the changes of the market environment. In contrast, there are numerous noise traders in the market, who are significantly affected by noises. The noise traders always exhibit the positive feedback trading characteristics of buying high and selling low (De Long *et al.*, 1990b; Barber & Odean, 2008), and their irrational behaviors are systematic correlated, so noise trader risk becomes an important systematic risk factor for the limits of arbitrage. We define the expectation of noise traders on future returns as irrational sentiment, which is not as "smart" as rational sentiment.

Based on the above discussions, we will test three hypotheses:

Hypothesis 1: Rational and irrational sentiment has a positive impact on the short-term returns.
When many systematic correlated noise traders become optimistic on the future asset prices, the asset prices will increase due to the persistent speculative price pressure even fundamentals don't change (Dorn, Huberman & Sengmueller, 2008). So we can predict that irrational sentiment leads the short-term returns in the market dominated by noise traders, especially with short sale constraints. When noise traders are overoptimistic, the optimal strategy of smart investors is to follow the trend rather than to sell short, otherwise, they have to take a very high noise trader risk for their short positions (De Long *et al.*, 1990a). Even when smart investors are sure that the asset prices are overvalued, they may find that the arbitrage opportunities are not profitable for high arbitrage costs or the lack of proper tools to sell short. Therefore, in the market with arbitrage constraints, rational sentiment should follow the changes of irrational sentiment, that is, the smart investors should become optimistic when they expect more people will become optimistic (Shleifer, 2000). Although rational and irrational sentiment both has positive power to predict short-term returns, the stories are quite different. Irrational sentiment leads short-term returns because it plays an important role in the formation of the asset short-term prices while noise traders know little of smart investors. To some extent, smart investors are the follower of noise traders, because they know it is too costly and risky to offset the demand shocks of noise traders.

Another important reason of hypothesis 1 is that numerous high speculative individual investors, who are obviously labeled as buying high and selling low, directly involve in stock market, so asset prices are more sensitive to investor sentiment in Chinese stock market than that in mature markets. The influence of investor sentiment on asset subsequent prices is positively correlated to the feedback intensity between investor sentiment and asset prices, that is, the stronger the feedback effect, the higher the predictability of investor sentiment on short-term returns (Hu & Chi, 2012a). On the contrary, asset prices are hardly affected by noise trading in the market in which only a few noise traders participate, and investor sentiment has little predictability on the future returns (Finter, Niessen-Ruenzi & Ruenzi, 2010). Therefore, the empirical results obtained with the data in Chinese stock market may significantly different from that focus on mature markets. In order to discuss more detailed relationship between investor sentiment and asset prices, rational and irrational sentiment will be decomposed into two parts: expected and unexpected part.

Hypothesis 2: Assuming irrational sentiment is a contrarian indicator to predict future long-term returns.
In the short term, asset prices could be significantly affected by irrational sentiment for price pressure effect. The noise traders' demands of risky assets increase when they are bullish, which leads to asset prices going up. In return, the increasing of asset prices will cause the noise traders to be more optimistic, which finally leads to periods of market overvaluation. Therefore, high current irrational sentiment is followed by low long-term returns because the asset prices will go back to their intrinsic values eventually (De Bondt & Thalar, 1989; Campell, 1999; Brown & Cliff, 2005). The positive feedback mechanism between irrational sentiment and asset prices amplifies the impact of market information on asset prices and causes noise traders to overreact to market information (Daniel, Hirshleifer & Subrahmanyam, 1998). Therefore, although the short-term returns are positively affected by irrational sentiment, in the long run, irrational sentiment is a reverse indicator of future returns. From the short-term to long-run, it is a gradual process that the direction of irrational sentiment forecasting future returns goes from positive to negative (Barberis, Shleifer & Vishny, 1998).

Hypothesis 3: Although rational sentiment can correctly predict future long-term returns, it appears to have little predictive power on medium-term returns.
Schmeling (2007) finds that the changes of rational and irrational sentiment are positively correlated in the short term while negatively correlated in the long run. Compared to noise traders, smart investors are more sophisticated and informed, so rational sentiment should reflect the correct expectations of fundamentals (Campbell & Kyle, 1993; Schmeling, 2007). We expect that smart investors are able to fulfill their superiority so that rational sentiment correctly predicts market returns over long horizons. However, the strategies of smart investors are not only based on fundamentals, but also related to irrational sentiment (Keynes, 1936; De Long *et al.*, 1990b). When noise traders appear to be excessive optimistic and the assets are overvalued, according to the intuitions, smart investors should become pessimistic for low returns in the future. But it is very risky for smart investors to short because of noise trader risk. As a result, if the smart investors expect that noise traders will become more optimistic in the future, which indicates that the up-trend of asset prices does not change, it is a better option for smart investors to buy risky assets rather than sell short. It is only when smart investors believe that the optimism of noise traders is too high to persist and the expected returns can't offset the potential risk, the smart investors will take short positions ahead of the public. Although rational sentiment becomes bearish, the asset prices may not decrease immediately because lots of noise traders are still excessive optimistic or unexpected shocks, which indicates rational sentiment are negative correlated to asset medium-term prices. In short, as smart investors pay more attention to irrational sentiment than fundamentals in the short and medium term, they will choose different strategies according to their expectations of the changes of irrational sentiment, which leads to little significant predictability of rational sentiment on medium-term returns.

3. Empirical Research
3.1.Data
In our empirical research, four indirect market indicators are selected to construct the investor sentiment proxies: turnover (turn), closed-end fund discount (cefd), the number of new open account (open) and consumer confidence index (cci). All of our data follow the Hu & Chi (2012b), with the sample period from January 2003 to December 2011.[①]

Both rational and irrational sentiment indexes are constructed by principal component analysis as Baker & Wurgler(2006). But what differs from BW is that Hu & Chi(2012b) argues that most investors in stock market are the combinations of "animal spirits" and "economic man". Every investor intends to gain wealth through stock market motivated by the "economic man" part. However, they may also be restricted by "animal spirits" such as representativeness, sensation seeking, loss aversion, etc. The weight of "animal spirits" and "economic man" may

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[①] Detailed discussion of the method to measure rational and irrational sentiment is provided in Hu & Chi (2012b).

vary among different investors, consequently, generating some investors "smarter" than others. As most investors are the combinations of "animal spirits" and "economic man", the single sentiment index, which reflects their cognition and behavior, may contain these two aspects: on one hand, showing the irrational factors of "animal spirits", on the other hand, reflecting the rational investor as "economic man". In order to extract the common components, we can select a variety of single sentiment indexes and conduct principal component or factor analysis. From a series of empirical tests, the rational and irrational sentiment indexes are consistent with expectations. The forecast, by the rational sentiment, of returns in the following 1 to 18 months is always positive (or at least nonnegative). The forecast by the irrational sentiment experiences a process turning gradually from positive to negative. That is, the irrational sentiment may cause mispricing of the asset in the short term, while can be corrected in the long run. Causality test results indicate that, the irrational sentiment is positively influenced by earlier returns, showing the characteristic of positive feedback, while not affected by fundamental factors. On the contrary, the rational sentiment is not affected by previous returns, but fundamentals. In addition, reasonable explanations can be resulted from the comparative analysis of 15 common used single sentiment indexes.
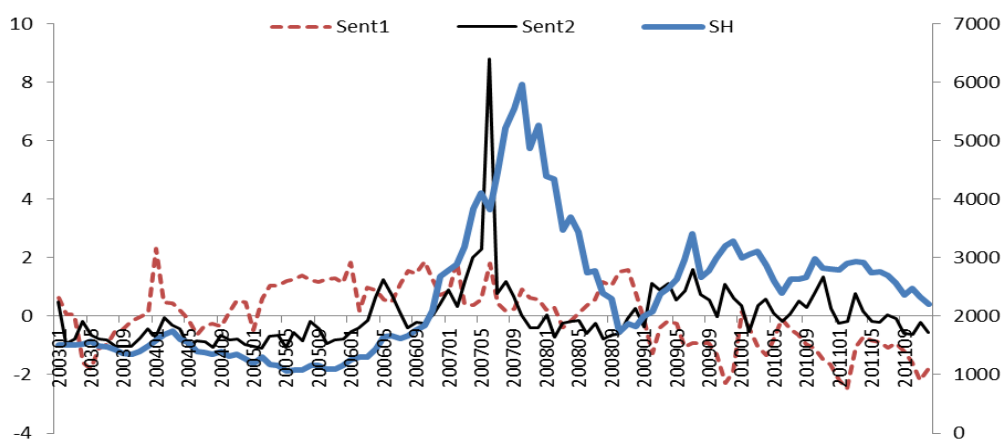

Figure 1.Time series of Shanghai Composite Index, rational and irrational sentiment

3.2. Investor sentiment and short-term returns

Just as Brown & Cliff (2005) mentioned that investor sentiment represents the expectations of asset prices in the future. The optimistic sentiment accumulates gradually when increasing investors turn to have the same prospection of the market, which means that, in a certain period, investor sentiment is changing continuously. In fact, when facing the continuously arriving news, investors adjust their beliefs frequently, which is defined as the external information impact. However, the rangeability of this adjustment cannot be observed in advance. Based on the above analyses, we divide investor sentiment into two parts, the expected part and unexpected part. Thus, the unexpected part of investors sentiment in every period is called sentiment shock. Then, we have:

$$sent_{i,t}^{s} = sent_{i,t} - E_{i,t-1}sent_{i,t}, \qquad i = 1,2 \tag{1}$$

Where, $sent_{i,t}^{s}$ is the sentiment shock comes from sentiment i ($i=1, 2$) in month t and $sent_{i,t}$ is the actual sentiment i in month t, while $E_{i,t-1}sent_{i,t}$ is the expected value in month t-1. $sent_1$ and $sent_2$ represent rational and irrational sentiment separately.

From figure 1, we can conclude that rational sentiment is significantly more stable than irrational one, which indicates that they are performed to have less feedback trading characteristics. Thus, we can simply assume that the previous period sentiment equals to the expected sentiment i. Then, we have:

$$E_{t-1}sent_{1,t} = sent_{1,t-1} \tag{2}$$

Accordingly, the rational sentiment will be:

$$sent_{1,t}^{s} = sent_{1,t} - sent_{1,t-1} \tag{3}$$

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Hu & Chi (2012a) has proved that the mispricing follows an autoregressive process when asset prices are affected by feedback trading. Meanwhile, compared to rational investors, irrational investors are more likely to have feedback trading characteristics, which means that the variation of irrational sentiment is more likely to follow an autoregressive process. Thus, the time series of irrational sentiment should be:

$$sent_{i,t} = \alpha_0 + \sum_{j=1}^{n} \alpha_j sent_{i,t-j} + \varepsilon_{i,t} \qquad (4)$$

That is,

$$E_{t-1}sent_{2,t} = \alpha_0 + \sum_{j=1}^{n} \alpha_j sent_{2,t-j} \qquad (5)$$

Accordingly, irrational sentiment will be:

$$sent_{2,t}^{s} = sent_{2,t} - E_{t-1}sent_{2,t-1} = \varepsilon_{2,t} \qquad (6)$$

Based on SIC, the lag order of equation (4) is *2* for irrational sentiment. Then, just as mentioned above, we separate rational and irrational sentiment into two parts, the expected part and the unexpected sentiment shocks.

After each variable has been defined, we construct the regression equation as follows:

$$rt_t = \beta_0 + \beta_1 E_{1,t-1}sent_{1,t-1} + \beta_1^{s} sent_{1,t-1}^{s} + \beta_2 E_{2,t-1}sent_{2,t-1} + \beta_2^{s} sent_{2,t-1}^{s}$$
$$+ \beta_3 mci_{t-1} + \beta_4 cpi_{t-1} + \beta_5 iavr_{t-1} + \varepsilon_t \qquad (7)$$

Where, cpi, mci and $iavr$ represent consumer price index, macroeconomic climate index and the growth ratio of industrial added value respectively.

Table 1. Regression results of short-term returns

Variable	(1)	(2)	(3)	(4)
$sent_{1,t-1}^{s}$	-0.0306* (0.0155)	-0.0291* (0.0152)	-0.0168 (0.0140)	-0.0150 (0.0127)
$sent_{2,t-1}^{s}$	0.0214** (0.0100)	0.0204* (0.0114)	0.0209*** (0.0062)	0.0195*** (0.0059)
$E_{1,t-2}sent_{1,t-1}$			0.0251*** (0.0074)	0.0247*** (0.0078)
$E_{2,t-2}sent_{2,t-1}$			0.0347*** (0.0090)	0.0375*** (0.0095)
mci		-0.0188* (0.0101)		-0.0198* (0.0104)
cpi		0.0052 (0.0106)		0.0022 (0.0100)
iavr		-0.0061 (0.0096)		-0.0061 (0.0099)
adj. R-sq	0.0600	0.0910	0.1620	0.2020

Our regression results, listed in table 1, exhibit the affects that come from expected sentiment and unexpected sentiment shocks to the next period returns. We can conclude from these results that, when ignoring the influences from expected rational and irrational sentiment, unexpected irrational sentiment shocks have positive impacts on the next period returns, while unexpected rational sentiment shocks have negative ones. That is to say, when the unexpected irrational sentiment shocks are positive, investors' stock demands increase. Therefore, driven by this optimism, asset prices will be pushed up. However, rational sentiment represents rational investors' long-term expectations of asset prices, which should keep stable in the short term. When realizing the increasing risks, rational investors become relatively cautious in making decisions, which gives a corking explanation of why unexpected rational sentiment negatively affects the short-term returns. Nevertheless, compared to the short-term variation of irrational sentiment, the predictability of unexpected rational sentiment is not statistically significant because rational investors pay more attention to the long-term tendency of irrational sentiment.

In further analyses, we find that the expected sentiment, no matter it is rational or irrational, have significant positive effects on the subsequent returns, which is consistent with our hypothesis 1. Specifically, due to the price pressure

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effect, the smart money objectively strengthens the current trend of asset prices in order to take the advantage of noise traders. In addition, we discover that unexpected irrational sentiment shocks have positively affected the next period returns also, while the regression loading of rational sentiment shocks is not significant, which indicates that unexpected rational sentiment has no distinct impacts on the short-term returns. Then, we can conclude that the expected rational sentiment, representing the continuous and consistent anticipations of asset prices, is the main factor of rational sentiment that can affect the short-term returns. More importantly, our conclusions don't change when macroeconomic factors are introduced into the regression equation as control variables.

3.3. Investor sentiment and long-term returns
In this section, different from above analyses, we don't make decomposition of investor sentiment when investigating the relationship between sentiment and long-term returns. The regression equation we adopt is as follows:

$$\sum_{i=1}^{k} rt_{t+i} = \beta_0 + \beta_1 sent_{1,t} + \beta_2 sent_{2,t} + \beta_3 mci_t + \beta_4 cpi_t + \beta_5 iavr_t + \upsilon_t^k \tag{8}$$

In the long-horizon regressions, an unavoidable econometric problem emerges that, with overlapping observations exists in the two adjacent explained variables, the residuals are seriously correlated. After several solutions are filtered, we finally choose the bootstrap method, used by Brown & Cliff (2005) and Schemling (2007), to solve this problem. Specifically, with the assumption that the coefficients of sentiment variables equal to 0, we run a VAR analysis of explained variables, sentiment variables and macroeconomic variables (according to SIC, the lag is 1). Then, we bootstrap the residuals to recursively generate time series of variables with which we run equation (8), this process is repeated for 10,000 times. As listed in table 2, p values are the results from the empirical distributions through our simulations. We do not give out the estimation results of macroeconomic variables to save space.

When both rational and irrational sentiment are taken into consideration, we find that irrational sentiment can positively predict the future returns in the next 3, 6 and 9 months and the loadings are diminishing. Simultaneously, with the analysis period length extending to 12-18 months, the loadings of irrational sentiment turn to be negative but not significant. This tendency does not change until the period is extended to over 21 month, in which the loadings become significant again. Summarily, as the extension of our inspection periods, the loadings of irrational sentiment monotonically decline and their symbols turn from positive to negative, which apply with our hypothesis 2. That is to say, although the irrational sentiment's impacts on stock returns show a price pressure effect in short-term, in the long run, the more excessive optimistic, the greater the asset prices are overvalued, which is accompanied with lower future returns.

Compared with irrational sentiment, the loadings of rational sentiment are positively related to the length of our analyzing periods. At the same time, we find that the loadings of rational sentiment are all insignificant during the periods from 3 to 12 months. However, the rational sentiment loadings become significant till the periods are extended up to 15 months, which supports our hypothesis 3. In other words, rational sentiment has positive predictability on the future returns in both short-term and long-run.
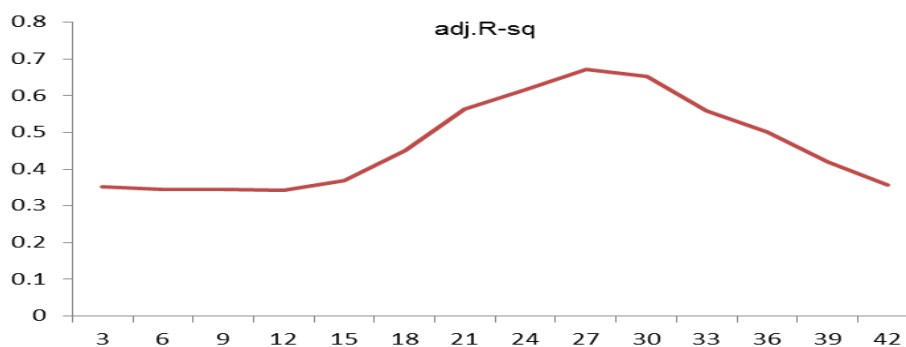

Figure 2. Changes of R^2

Furthermore, it is shown that the R^2 is increasing as the extension of our analyzing period. But when it comes to 30 months, the R^2 begins to decrease and both rational and irrational sentiment loadings are reverting to 0. This result indicates the fact that, investor sentiment, rational or irrational, represents the expectations of future returns, which are derived from market information. In a time-variant market, with capability restrictions of cognition and computation, the accuracy of investors' predictability is continuously attenuated as the extension of the forecast

period. Just as we conjecture that, the returns are mainly dramatically affected by irrational sentiment in the short term, while positively predicted by rational sentiment in the long run.

Table 2. Regression results of rational and irrational sentiment and stock returns

k	variable	coefficient	p value	adj.R-sq
3	sent1	0.0610	0.1748	0.3531
	sent2	0.0547	0.0017	
6	sent1	0.1388	0.1279	0.3441
	sent2	0.0470	0.0677	
9	sent1	0.1869	0.1279	0.3439
	sent2	0.0184	0.0677	
12	sent1	0.2953	0.2376	0.3423
	sent2	-0.0187	0.3986	
15	sent1	0.3597	0.082	0.3697
	sent2	-0.0787	0.3829	
18	sent1	0.4167	0.0532	0.4517
	sent2	-0.1321	0.1046	
21	sent1	0.5018	0.0119	0.5638
	sent2	-0.1409	0.0000	
24	sent1	0.5940	0.0118	0.6171
	sent2	-0.1461	0.109	
27	sent1	0.7040	0.0078	0.6706
	sent2	-0.1779	0.068	
30	sent1	0.700757	0.0042	0.6532
	sent2	-0.19083	0.0608	
33	sent1	0.5951	0.0037	0.5583
	sent2	-0.1841	0.037	
36	sent1	0.4969	0.0351	0.5008
	sent2	-0.1634	0.0409	
39	sent1	0.4141	0.0497	0.4188
	sent2	-0.1683	0.0336	
42	sent1	0.3599	0.1074	0.3559
	sent2	-0.1423	0.1346	

3.4. Why most investors do not success?

If investors have realized these facts mentioned above, they are seemed to have found some solutions to make profits and succeed. Unfortunately, numerous facts have shown that only few of them outperform the market while the others suffer welfare losses. To explain this phenomenon, we believe that, firstly, overconfident investors often overestimate themselves in decision making, which distinctly increases their transaction costs (Barber & Odean, 2000). Secondly, some investors with high risk preference are more focused on the probability of high returns instead of constructing a diversified portfolio, which brings a high possibility of losses (Barber & Odean, 2008; Barberis & Huang, 2008). In this paper, we investigate investor sentiment and its predictability of stock returns. However, our conclusions do not support that investors can take the advantage of sentiment and make excess returns in cross-sectional market for granted. Actually, most investors often fail to maintain their investment strategies. Instead, they dynamically choose the one which is thought to maximize their expected returns but effectively affected by noises and alleged "experts' recommendations". According to Barber, Lee, Liu & Odean (2011), only a few investors outperform the market during the struggle with their avariciousness. In fact, the majority of investors make correct decisions in very small probabilities, which would reduce their welfare. Even worse, these investors are forgetful and hot-headed, which lead them to make the same mistakes that they have suffered from not long before (Feldman, 2010). Finally, many empirical researches have proved that retail investors are tend to be noise traders who are strongly affected by disposition effect, which makes them unable to maximize their profits in a bull market but suffering a great losses in a bear market.

Then, why those dumb noise traders have not been driven out of the market? We believe there are two main reasons. On the one hand, retail investors don't make mistakes all the time. Instead, because of the price pressure effect, noise traders might gain higher returns than "smart money" in short-term, which can offset some of their losses in the future. On the other hand, even some noise traders have been out of the market, there are still a large number of new investors who are continuously joining in. Therefore, there are always noises in our market.

CONCLUSION

A main characteristic of capital market is fractal, which means that the interaction mechanism of sentiment and asset prices is time-varying. In this paper, in order to give a more comprehensive description of investor sentiment and its impacts, we investigate the predictability of rational and irrational sentiment on future returns in both short and long term. Our results show that rational sentiment is positively related to future returns, while irrational sentiment

positively predicts future returns in short-term, but giving a negative prediction in long-term. Different from previous studies, we find that rational and irrational sentiment does not only have predictability on the long-run returns, but also have significant influence on the short-term returns, which is consistent with that noise traders play an important role in the formation of asset short-term prices in Chinese stock market. Last but not the least, the predictability of investor sentiment, rational or irrational, stays robust during our empirical analyses, which indicates that our redefinition of "rational" and "irrational" have strong reasonableness.

To sum up, our study can help us further understand about investor sentiment and its impacts on asset prices, which support the viewpoint that sentiment should be introduced into asset pricing models. Meanwhile, considering the fact that rational investors who should have stabilized stock market will probably push up short-term asset prices to a higher level than their intrinsic values, our conclusions also remind the market regulator to pay more attentions to the "irrational exuberance".

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