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ORIGINAL ARTICLE

INVESTOR SENTIMENT AND STOCK RETURNS

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Abstract:

The history of the stock market is full of events striking enough to earn their own names: the Great Crash of 1929, the 'Tronics Boom of the early 1960s, the Go-Go Years of the late 1960s, the Nifty Fifty bubble of the early 1970s, the Black Monday crash of October 1987, and the Internet or Dotcom bubble of the 1990s. Each of these events refers to a dramatic level or change in stock prices that seems to defy explanation. The standard finance model, in which unemotional investors always force capital market prices to equal the rational present value of expected future cash flows, has considerable difficulty fitting these patterns. Researchers in behavioral finance have therefore been working to augment the standard model with an alternative model built on two basic assumptions.

KEYWORDS:

Bank linage, Micro finance, NABARD. Self Help Group, Performance .

INTRODUCTION:

The first assumption, laid out in Delong, Shleifer, Summers, and Waldmann (DSSW, 1990), is that investors are subject to sentiment. Investor sentiment, defined broadly, is a belief about future cash flows and investment risks, that is not justified by the facts at hand (Baker & Wurgler, 2007). Alternatively, investor sentiment can be defined as the collective beliefs of investors about the market, the returns and risks involved with certain financial instrument(s), company(s), event(s) etc.

The second assumption, emphasized by Shleifer and Vishny (1997), is that betting against sentimental investors is costly and risky. As a result, rational investors (arbitrageurs) are not as aggressive in forcing prices to fundamentals as the standard model would suggest. In the language of modern behavioral finance, there are limits to arbitrage. Recent stock market history has cooperated nicely, providing the Internet bubble and the ensuing Nasdaq and telecom crashes, and thus validating the two premises of behavioral finance.

According to the efficient market paradigm, investors use all available information to set prices and there is no need to disentangle how the market uses information since there is an immediate link between prices and information (Daniel, 2004). Recent research, however, shows that individual biases cause investors to misinterpret financial statement information. This research stems from a belief that such biases are systematic across individuals and are not cancelled or diversified away in aggregate. Further, arbitrage is limited and arbitrageurs cannot drive biased irrational investors out of the market in the short run (Hirshleifer and Teoh, 2003).

The Efficient Market Hypothesis does not rule out the possibility that investors act irrationally, but only that if they do their actions will be exploited by rational investors and arbitraged away. The rational investor would look to maximize returns and minimize losses based on the available information. Most

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theories assume the individual to be rational and all information to be available. But in the field of behavioral economics it is assumed that individuals often make irrational decisions and explores why they do so. Additionally, the theory of bounded rationality says that people are not always able to obtain all the information they would need to make the best possible decision.

More recent studies, such as Baker and Wurgler (2006), utilize interim advances in behavioral finance theory to provide sharper tests for the effects of sentiment. In particular, in the many behavioral models of securities markets inspired by DSSW (1990), investors are of two types: rational arbitrageurs who are sentiment-free and irrational traders prone to exogenous sentiment. They compete in the market and set prices and expected returns. But rational arbitrageurs are limited in various ways. These limits come from short time horizons or from costs and risks of trading and short selling. As a result, prices are not always at their fundamental values. Mispricing, hence, arises out of the combination of two factors: a change in sentiment on the part of the irrational traders, and a limit to arbitrage from the rational ones.

In this study, a suitable sentiment index is developed, and its relationship with market returns is analyzed. This is motivated by ongoing but inadequate research on the subject, especially pertaining to India, which is even more notable in the light of the fact, that emerging markets such as India are expected to be impacted more by investor sentiment and hence exhibit higher volatility compared to mature markets.

REVIEW OF LITERATURE

There is a growing body of both theoretical and empirical literature that examines the role of investor sentiment and its implications for financial markets and institutions. Brown and Cliff (2004) say, “Sentiment represents expectations of market participants relative to a norm: a bullish (bearish) investor expects returns to be above (below) average, whatever “average” may be.” It can also be defined as propensity to speculate or the optimism or pessimism about a given asset; a belief about future cash flows and investment risks that is not justified by the facts at hand (Baker and Wurgler, 2006, 2007).

Sentiment, as a factor affecting stock returns was first documented by Lee, Shleifer, and Thaler (1991), Chen, Kan, and Miller (1993); and Chopra, Lee, Shleifer, and Thaler (1993). Lee, Shleifer, and Thaler (1991) propose that the changing sentiment of individual investors toward closed-end funds and other securities explains the fluctuations of prices and discounts on closed-end funds. Discounts are high (low) when investors are pessimistic (optimistic) about future returns. The evidence suggests that discounts on closed-end funds are a proxy for changes in individual investor sentiment, and that the same sentiment affects returns on smaller capitalization stocks and other stocks held and traded by individual investors. This central claim of Lee at al's is rejected by Chen, Kan, and Miller (1993) which is later refuted by Chopra, Lee, Shleifer, and Thaler (1993).

Shleifer and Vishny (1997) derived a model where they show that in extreme circumstances, professional arbitrageurs may not be successful in bringing security prices back to its fundamental values. Hence the investor sentiment and stock returns relationship is not consistent with the classical framework.

Brown and Cliff (2005) highlighted that investor sentiment is driven by persistent uninformed demand shocks, while limits to arbitrage will deter informed traders from trading. Limits to arbitrage may be either due to high trading costs, financing costs or information costs that rational investors may have to incur in order to take an advantage of market mispricing.

Schmeling (2007) found that individual sentiment is a proxy for noise trader risk (dumb money), and institutions seem to be informed investors (smart money). The author found that sentiment matters for several stock markets around the world and over intermediate horizons of up to 1 1/2 years. Also, there is a sharp difference between the two investor groups - institutional investor sentiment forecasts stock returns correctly on average, and individual sentiment negatively predicts market movements i.e. overoptimistic (over-pessimistic) noise traders drive markets away from intrinsic values.

How is sentiment measured though? Over the years, a variety of investor sentiment measures have emerged, with majority of the research focused on the developed markets of US and UK. Many of those measures remained as boutique proxies. Some have been controversial in their appropriateness as a proxy for sentiment.

Seyhun (1988) used the information content of aggregate insider trading data to address the possibility of predicting future stock market returns. An unusual increase (decrease) in stock purchases (sales) by insiders in the aggregate is presumed to signal an increase (decline) in the stock market.

Doukas and Milonas (1994) investigated whether investor sentiment, measured by the change in the discount/premium on closed-end funds, is associated with higher returns required by Greek investors as a compensation for being exposed to sentiment risk, and found no evidence supporting sentiment as an independent source of systematic risk in the return generating process.

Baur, Quintero, and Stevens (1996) test the proposition that investor sentiment contributed to the stock market crash of 1987, using discounts and premiums on closed-end fund as a proxy for sentiment, but fail to find a significant relation of the index for investor sentiment with stock prices. They conclude that either the proxy or the measurement of investor sentiment is faulty or investor sentiment is not a powerful influence on stock prices in the 1934-91 time period.

Shiller, Kon-Ya and Tsutsui (1996) take a direct approach to capturing market sentiment by sending a semi-annual mail survey to institutional investors, asking their opinion about the market in the U.S. and Japan, looking for reasons for the Nikkei crash of 1989. While no unambiguous explanation of the Japanese crash emerges from the results, they do find a clear relation of the crash to changes in Japanese price expectations and speculative strategies. Swaminathan (1996) used closed-end fund discounts as a proxy of individual investors' rational expectations about future economic conditions. He found that closed-end fund discounts forecast future small firm returns.

Neal and Wheatley (1998) examine the power of three popular measures of investor sentiment to predict returns: Closed-end fund discount (CEFD), ratio of odd-lot sales to purchases, and net mutual fund redemptions. Using data from 1933 to 1993, they find that CEFD and Net MF Redemptions predict the size premium (difference between small and large firm returns), but little indication that the odd-lot ratio predicts returns.

Barber (1999) uses the ratio of odd-lot purchases to sales as a measure of small investor sentiment, and documents that small firms do well (poorly) when small investors are optimistic (pessimistic). In contrast, large firms are generally unaffected by the sentiment of small investors. Otoo (1999) examines the relationship between movements in consumer sentiment (using survey sentiment as a measure) and stock prices. Using aggregate data, the author finds that growth in consumer sentiment and stock prices share a strong contemporaneous correlation. Stock prices influence sentiment, but the reverse is not found to be true. The author also concludes that people use movements in equity prices as a leading indicator of future economic activity and potential labor income growth.

Fisher and Statman (2000) used survey measure of sentiment to study three groups of investors – large Wall Street strategists, medium writers of investment newsletters, and small individual investors, and found a negative relationship between the sentiment of each of these three groups and future stock returns. But the relationship between the sentiment of newsletter writers and future S&P 500 returns was not found to be statistically significant.

Lashgari (2000) studied two measures of confidence indexes – TED spread, and Barron's yield spread ratio. The yield-spread is defined as the difference in yield between the high quality and the intermediate quality bonds. TED spread is the difference in yields (prices) for the nearby futures contracts on the U.S Treasury bills and the eurodollar bond deposits. In both cases, a narrowing of the spread signals a higher confidence in the financial markets, while the widening of the spread reveals fear and flight to quality.

Whaley (2000) used the VIX which is said to be the “investor fear gauge.” The author says “fear” because investors are averse to risk. Since the VIX is constructed from the implied volatilities of S&P 100 index options, it is, by definition, a measure of expected stock market risk. Investors set the level of the VIX – investor demands for S&P 100 call and put options set prices, and these prices, in turn, are used to imply the level of the VIX.

Lakonishok and Lee (2001) investigated the usefulness of insiders' activities in timing the market and in predicting cross-sectional variations in stock returns, and found that aggregate insider trading appeared to predict market movements. When insiders were optimistic (buying), markets on average did well, and when they were pessimistic (selling), markets did poorly.

Baker and Stein (2002) suggested market liquidity as a sentiment indicator. An unusually liquid market is one in which pricing is being dominated by irrational investors, who tend to under-react to the information embodied in either order flow or equity issues. Thus high liquidity is a sign that the sentiment of these irrational investors is positive i.e. market is overvalued, and that subsequent expected returns are therefore abnormally low. Dennis and Mayhew (2002) used the Put-Call Ratio as a measure of trading pressure or market sentiment to explain skewness in option prices. The ratio of put-to-call trading volume is believed to be a sentiment index, with more put volume indicating pessimism.

Kumar & Persaud (2002) employed the Risk Appetite Index to explain developments in global financial markets, including financial crises. They argued that investors' appetite for risk changes over time and can be measured, and that models based on fundamentals alone would have less predictive power than those which embody some measure of risk appetite.

Brown, Goetzmann, Hiraki, Shiraishi, and Watanabe (2003) found evidence that daily mutual fund flows may be instruments for investor sentiment about the stock market. They constructed a new index of investor sentiment (as a linear combination of category flows), and validated this index using data from

both the United States and Japan.

Jansen and Nahuis (2003) studied the (short-run) relationship between stock market developments and consumer confidence in 11 European countries over the years 1986–2001. They found that stock returns and changes in sentiment were positively correlated for nine countries, with Germany the main exception. For measuring consumer confidence, they used data from the consumer confidence surveys published by the European Commission for all EU countries.

Brown and Cliff (2004) examined the importance of sentiment in determining returns. They documented a strong relation between the direct and indirect measures of sentiment. Two surveys were used as a direct measure of sentiment - American Association of Individual Investors (AAII) for individual investor sentiment, and Investors Intelligence (II) for institutional investor sentiment. Several indirect measures of sentiment were used, e.g. ADV/DEC, PUT/CALL, FUNDFLOW, etc. They found high correlation with contemporaneous market returns, but very little evidence towards predicting subsequent market returns.

Charoenrook (2005) examined a sentiment measure based on the University of Michigan Consumer Sentiment Index and found changes in consumer sentiment to bne positively related to contemporaneous excess market returns and negatively related to future excess market returns.

Baker and Wurgler (2006) examined how investor sentiment affects the cross-section of stock returns. They gathered six proxies for sentiment (Closed-end fund discount, NYSE share Turnover, Number and average first-day Returns on IPOs, the Equity share in new issues, and the Dividend premium) and formed a composite sentiment index based on their first principal component. The authors suggested that when sentiment is low (high), subsequent returns are relatively high (low) on smaller stocks, high volatility stocks, unprofitable stocks, non-dividend-paying stocks, extreme growth stocks and distressed stocks. These patterns reverse when sentiment is high.

Bandopadhyaya (2006) examined Put-Call Ratio (PCR) and the VIX as two measures of sentiment and found that PCR better mirrored actual market movement and is a better choice for measuring market sentiment.

Glushkov (2006) constructed an aggregate measure of investor sentiment as the first principal component of several investor sentiment measures and developed a stock-by-stock measure of investor sentiment called sentiment beta (defined as sensitivity of stock returns to sentiment changes). More sentiment-sensitive stocks are smaller, younger, with greater short-sales constraints, higher volatility and lower dividend yields. Stocks that are more exposed to sentiment changes deliver lower future returns.

Kumar & Lee (2006) used retail investors' trading activities to obtain direct measures of retail investor sentiment changes and found that these measures have incremental explanatory power for small stocks, value stocks, stocks with low institutional ownership, and stocks with lower prices. The direction of the relation indicates that when retail investors grow relatively bullish (bearish), the stocks in these portfolios enjoy higher (lower) excess returns.

Lemmon and Portniaguina (2006) explored the time-series relationship between investor sentiment and stock returns using consumer confidence as a measure of investor optimism. Using two survey measures of sentiment, they assessed the extent to which sentiment affected the prices of different stocks in times of optimistic or pessimistic assessment of market conditions by investors.

Qiu and Welch (2006) distinguished between validation of sentiment proxies through sentiment survey and closed-end fund discount, and found that closed-end fund discount cannot be validated as a proxy, and consumer confidence can be validated as a proxy. The authors also explored the link between sentiment and financial prices and found that investor sentiment does have a contemporaneous correlation with certain financial market prices, specifically the size decile spread. Theoretically, this follows because 1) these categories of stocks tend to be harder to arbitrage (for example, they have higher transaction costs) and 2) they are more difficult to value, making biases and valuation mistakes more likely (Baker and Wurgler 2007).

Grossman, Ozuna, and Simpson (2007) explained the mispricing of ADRs through US consumer sentiment, measured by University of Michigan Survey of Consumer Sentiment. They also used other respective survey measures for each of the other 8 countries' ADRs examined in their study. Leger and Leone (2007) used Consumer Confidence indicators as a variable to capture the evolution of market sentiment. They examined economic variables that help explain principal components in UK stock returns. They observed apparently systematic changes in the structure of risk, and conjectured that Consumer Confidence captures a change in market sentiment that could be a signal for the evolution of stock prices.

Kling and Gao (2008) used daily survey data on Chinese institutional investors' forecasts to measure investors' sentiment. They found that share prices and investor sentiment do not have a long-run relation; however, in the short-run, the mood of investors follows a positive-feedback process. Hence, institutional investors are optimistic when previous market returns were positive. Contrarily, negative

returns trigger a decline in sentiment, which reacts more sensitively to negative than positive returns.

Schmeling (2009) investigated the relation between investor sentiment and future stock returns for 18 industrialized countries, using consumer confidence as a sentiment proxy. The author found that sentiment is a significant predictor of expected returns on average across countries. This impact was higher for countries that are culturally more prone to herd-like investment behavior and for countries that have less efficient regulatory institutions or less market integrity.

Sehgal, Sood, Rajput (2009) conducted a survey of investor sentiment among various stakeholders in the Indian financial sector, to identify the various economic, market, and regulatory factors influencing sentiment. The market factors identified were Put Call Ratio, Advance Decline Ratio, P/E Ratio, P/B Value, and Earnings Surprises.

Bathia and Bredin (2010) conducted an international study examining the role of investor sentiment on the aggregate market returns of G7 nations. Sentiment proxies included in their study are consumer confidence index, equity fund flow, closed-end equity fund discount and equity put-call ratio. They found that there is a significant negative relationship between survey sentiment and stocks returns. When investor sentiment is high (low), subsequent stocks returns are low (high).

Akhtar, Faff, Oliver, and Subrahmanyam (2011) explored the aggregate Australian stock market reaction to periodic announcements of consumer sentiment from the Westpac–Melbourne Institute of Applied Economic and Social Research. They documented a “negativity effect” in which, upon announcement of bad (good) sentiment news, the equity market experiences a significant negative (no) announcement day effect.

Beer, Wafta, Zouaoui (2011) tested if the financial markets price the investor's sentiment risk. Using a composite sentiment index which includes several direct and indirect indicators identified in the previous literature, they constructed portfolios based on the exposure of stocks to sentiment factor. They found that the portfolio returns increase when they include the stocks most sensitive to the sentiment factor. They advised fund managers to take investor sentiment into account in the asset valuation models.

Kaplanski and Levy (2011) showed that the decline in the stock prices after aviation disasters is accompanied by a corresponding increase in perceived volatility, as measured by the VIX and VXO versions of the Fear Index as a potential proxy for market sentiment.

Ben-Rephael, Kandel, and Wohl (2012) used Net Exchanges (“exchanges in” minus “exchanges out” for each US mutual fund category) from the Investment Company Institute (ICI) data of monthly aggregate flows to US mutual funds, as a measure of sentiment. Net exchanges reflect asset allocation decisions of mutual fund investors on shifting between bonds to equity, and the authors documented a negative relation between net exchanges and subsequent excess market return.

Baker, Wurgler, Yuan (2012) constructed Total, Global, and Local Sentiment indices for 6 major stock markets (Canada, France, Germany, Japan, UK, and US), using four sentiment proxies – volatility premium, number and first-day returns from IPOs, and turnover. They found global sentiment to be a contrarian predictor of country-level market returns. Global and local sentiments are contrarian predictors of cross-sectional returns for hard-to-value and difficult-to-arbitrage (HV-DA) stocks.

Corredor, Ferrer, Santamaria (2013) analyzed the investor sentiment effect in four key European stock markets: France, Germany, Spain and the UK. They found that sentiment has a significant influence on returns, varying in intensity across markets. The variation appeared to involve both stock characteristics and cross-country cultural or institutional differences. The results also showed sensitivity to the choice of sentiment proxy.

Data

To evaluate the relationship between sentiment and stock returns (proxied by a composite measure(s) of investor sentiment), monthly data is obtained for the BSE 200 Companies from the year 2001-2013.

For estimation of sentiment, 4 proxies have been used: Put-Call Ratio, Advance-Decline Ratio, Turnover, and Dividend Premium, where:

PCR = Log difference of turnover (Cr. Rs.) of Puts and turnover (Cr .Rs.) of Calls
TURN = Log of reported share volume (in Rs. Million)
ADV/DEC = Number of Advancing shares / Number of Declining shares
DIVPRE = Log difference of average P/B ratios of highest dividend payers and lowest dividend payers

Data for TURN, ADV/DEC, and DIVPRE have been taken from Prowess (CMIE database), and data for PCR has been collected from NSE. To represent the market (RET), CNX Nifty prices for 2001-

2013 were collected.

Univariate summary statistics for the data are in Table 1 below:

	ADVDEC	DIVPRE	PCR	SENT1	TURN
Mean	1.274952	0.947387	-0.154502	5.377810	13.04608
Median	0.890000	0.813911	-0.100311	6.540000	13.07936
Maximum	10.12000	2.254629	0.379507	8.590000	14.18103
Minimum	0.100000	0.063377	-0.772237	0.430000	11.96251
Std. Dev.	1.240085	0.568977	0.245807	2.465092	0.453300
Skewness	4.020091	0.610955	-0.442210	-1.291654	-0.124837
Kurtosis	26.68321	2.522970	2.450013	2.897920	2.845453
Jarque-Bera	2736.732	7.527726	4.745500	29.24204	0.377221
Probability	0.000000	0.023194	0.093224	0.000000	0.828109
Sum	133.8700	99.47564	-16.22272	564.6700	1369.838
Sum Sq. Dev.	159.9324	33.66837	6.283781	631.9746	21.37006
Observations	105	105	105	105	105

Table 1: Summary statistics

This table shows summary statistics for the data used in the analysis. The full monthly sample contains 144 observations from April 2001 through March 2013.

Data Analysis

First the time series are examined for stationarity. Augmented Dickey-Fuller tests show that the investor sentiment proxies are I(1) variables, except ADV/DEC. The results are tabulated in Table 2 below:

Variable	ADF stat						
ADVDEC	-11.46698	Test critical values:	1% level		-3.47647		stationary at I(0)
			5% level		-2.88169		
			10% level		-2.57759		
DIVPRE	-10.7951	Test critical values:	1% level		-3.47681		stationary at I(1)
			5% level		-2.88183		
			10% level		-2.57767		
PCR	-14.47528	Test critical values:	1% level		-3.49502		stationary at I(1)
			5% level		-2.88975		
			10% level		-2.58189		
TURN	-16.18762	Test critical values:	1% level		-3.47714		stationary at I(1)
			5% level		-2.88198		
			10% level		-2.57775		

Table 2: Stationarity summary

Conducting the Principal Components Analysis on the four sentiment proxies, we find that the first principal component explains 49% of the sample variance. Using the loadings on the principal components, we compute the sentiment index (Table 3 below).

Eigenvalues: (Sum = 4, Average = 1)

Number	Value	Difference	Proportion	Cumulative Value	Cumulative Proportion
1	1.968275	0.909783	0.4921	1.968275	0.4921
2	1.058492	0.351209	0.2646	3.026767	0.7567
3	0.707284	0.441334	0.1768	3.734051	0.9335

Eigenvectors (loadings):

Variable	PC 1
ADVDEC	0.126963
DIVPRE	-0.645099
PCR	0.592597
TURN	0.465356

Table 3: Principal Components Analysis

Based on the loadings, the equation derived is:

$$SENTIMENTpc1 = 0.126963ADVDEC - 0.645099DIVPRE + 0.592597PCR + 0.465356TURN \quad (1)$$

A composite sentiment index is hence constructed. Checking SENTIMENTpc1 for stationarity, we find it to be a I(1) variable. SENTIMENTpc1 and RET are co-integrated. Testing the causality between the sentiment index and market returns, we find that sentiment is Granger-causing returns (Table 4).

Pairwise Granger Causality Tests
Date: 06/24/13 Time: 16:49
Sample: 2001M04 2013M03
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
RET does not Granger Cause SENT1	142	1.37906	0.2553
SENT1 does not Granger Cause RET		3.30081	0.0398

Table 4: Granger Causality

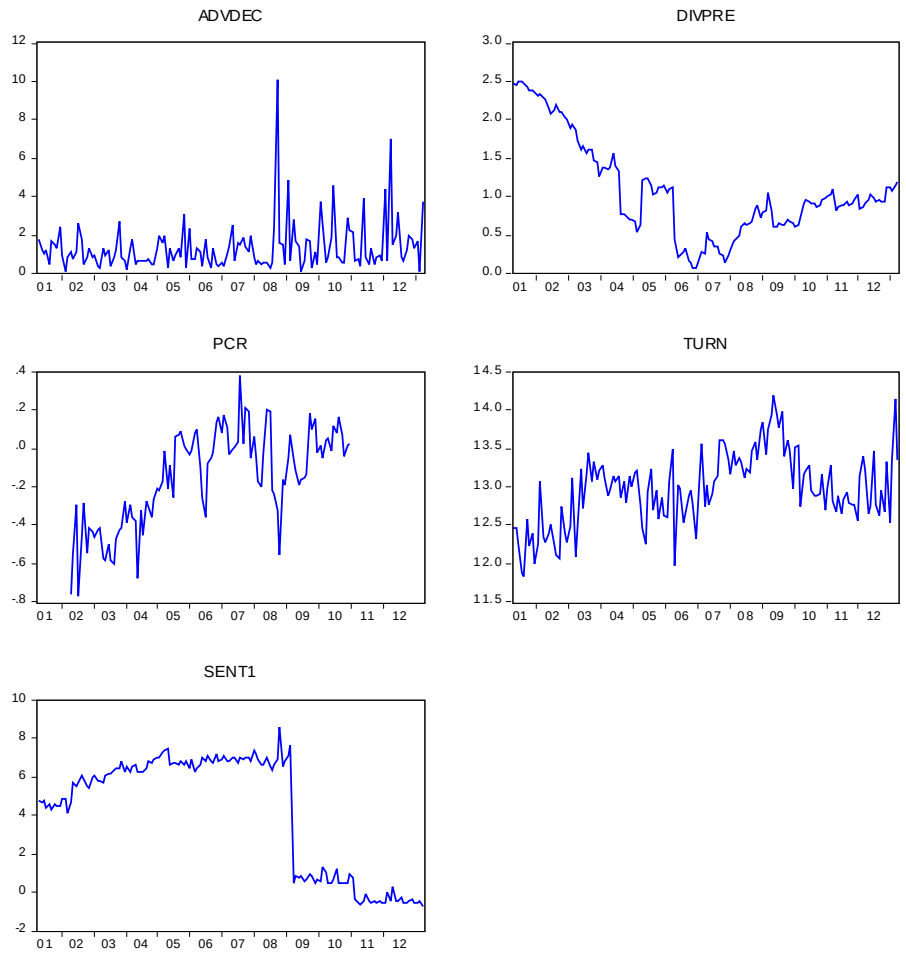

Figure 1: Investor Sentiment, 2001-2013

CONCLUSION

In summary, it has been demonstrated that investor sentiment as measured by a composite index of indirect proxies of sentiment is related to subsequent returns. As Hirshleifer (2001) said, "investor psychology is at the heart of a grand debate in finance spanning the last three decades. Financial economists have grown more receptive to imperfect rational explanations. Over time it is expected that a broader psychological paradigm will encompass the purely rational paradigm including full rationality as a significant special case".

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