

OVERREACTION AND UNDERREACTION IN STOCK MARKETS: A REVIEW

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ABSTRACT

Contrary to the conventional belief that the markets are rational and efficient (Fama E, 1970), investors overreact to both good and bad news. This may cause unjustifiable up and down movements in the stock price and enable investors to make irrational, short-term profits. The prices won't reflect the true value of the stock when the market is inefficient and hence this will be followed by a correction in the prices. Persistent overweighting of recent information and underweighting of long-term fundamentals by irrational investors will result in overreaction. This happens in the case of overconfident informed investors. This paper is a review of the works that analyse the overreaction in stock market.

KEYWORDS: Market Efficiency, Overreaction, Underreaction, Behavioural Finance

INTRODUCTION

Seasonality in stock prices, excess volatility, price earnings ratio anomaly etc. points to the irrationality in the investment behavior. The conservative individuals rely too much on their prior beliefs and tend to underreact where as salient and prominent information capture the attention of investors and causes overreaction. The markets systematically deviate from rationality and hence irrationalities and anomalies become predictable. The disproportionate importance given to short run economic developments causing misperception of future cash flow leads to inefficiency of stock markets. Market overreaction is an error of optimism or pessimism which gets propagated. Investors with limited rationale are prone to overreaction. Representativeness causes overreaction while underreaction could be attributed to conservatism. Investors' overestimates the value of the winners and underestimates the value of losers. This leads to mispricing and will be corrected by subsequent reversals in the returns. The literature on the overreaction tests the existence of the anomaly in the developed and developing markets and probes the causes for the same. The paper reviews the literature on the market anomaly. The first section reviews the literature on overreaction in different world markets. The works in the area specific to Indian stock market is then detailed. A discussion on various methods used to test the presence of the anomaly and the challenges put forward against the overreaction hypothesis is also presented. The concluding section abstracts the works done so far and opens avenues for further analysis.

OVERREACTION IN STOCK MARKET – GLOBAL EVIDENCE

Overreaction is reported to be the reason for long term return anomalies by DeBondt and Thaler (1985), in their premier paper on the issue. It can be taken as prediction of behavioural finance alternative to market efficiency. The authors tried to test whether the overreaction hypothesis is predictive and the test yielded positive results. The result throws light in to the fact that overreaction is different from January effect or the seasonality in stock prices. The test also proves

that looser portfolios outperform the winners and is less risky. The P/E ratio anomaly is reported to be a potential indicator of overreaction. In their follow-up paper (DeBondt and Thaler, 1987), they reported that the winner loser effect could not be attributed to size or the risk measured by CAPM betas. The evidence confirms that investors overreact to short term earning.

David N. Dreman and Eric A. Lufkin (2000) presents evidence that fundamentals show little or no change and continue the trend when there is sharp changes in the performance of the stocks. The extreme price performance couldn't be attributed to risk. As per the findings overreaction is evident before the portfolio formation. The work suggests that overreaction and underreaction are part of the same process and overreaction followed by, underreaction, not equilibrium is normal in investment markets. Evidence shows that the price reversals are not due to changes in fundamentals. It cannot be attributed to risk also. Hence the authors conclude that the overreaction of irrational investors contributes to these extreme price movements.

Jagadeesh (1990) and Lehman (1990) confirms abnormal returns for contrarian strategies in the short run and attribute this to short term price pressure and lack of liquidity and not to overreaction as the strategies are transaction intensive. The results documented reject the random walk hypothesis of stock prices. Andrew W Lo and A. Craig MacKinlay (1990) document that contrarian profits is not due to stock market overreaction alone but cross effects among the securities also contribute for the anomaly. Daniel et al. (1998) developed a theory based on investor overconfidence and self attribution bias. The investors reportedly overreact to private information and underreact to public information. The positive return autocorrelation is shown to be a result of continuing overreaction. The misinterpretation of genuine information is reported to be the main cause of mistakes committed by investors. The approach reconciles the long term volatility with short term momentum and effectively explains event based return predictability.

Pietro Veronesi (1999) had shown that in equilibrium the investors' who are willing to hedge against uncertainty overreact to bad news in good times and underreact to good news in bad times. The rational expectation model proposed best explains features of stock returns like volatility clustering, leverage effects, excess volatility and time varying expected returns. Barberis et al. (1998) present a model of investor sentiment, and have explained how investors form beliefs. The model is based on psychological evidence and produces both underreaction and overreaction for a wide range of parameter values. The strength and weight of the information affect the investment decisions and cause irrationalities such as overreaction and under reaction.

Ahmet Baytas and Nusret Cakici (1999) tested for overreaction hypotheses in seven industrialised countries, US, UK, Canada, Italy, Germany, France and Japan. They found no evidence supporting overreaction in US stock market. The anomaly is significant in all other countries except in Canada where the effect is very weak. The results also points to the asymmetry in overreaction effect. The asymmetry was very strong in Japan and this is attributed to the fact that the market there was more bullish. They suggested the overreaction in these countries to be a price based phenomena. Fuzzy Clustering Means Algorithm proposed by Aguiar et al. (2010) provides evidence for the presence of over reaction in the American stock market. The results point to the fact that abnormal profits could be achieved in American stock market by adopting contrarian strategy.

Odean (1999) tested overconfidence theory with investors having discount brokerage accounts. The study shows that they trade excessively bringing their returns to a value which is substantially low even in the absence of transaction

costs. The sold stocks outperform the bought ones after the transaction. This anomaly is due to overestimation of private information signals. Aurora Alonso and Gonsalo Rubio (1990) examined the overreaction hypothesis within the Spanish capital market. The hypothesis found acceptable even after correcting for size when estimating excess returns. The portfolios of losers were found to outperform winners after the formation period. The size effect could not account for the anomaly.

Gishan Dissanaïke (1997) investigated the evidence on the stock market overreaction hypothesis (ORH), using data from 1975 to 1991 for nearly 1,000 UK companies. The evidence supports the overreaction hypothesis, subject to certain qualification. Studies by Angelos Pepelas (2008) proved the existence of overreaction in UK stock market. The results do not support size effect and survivorship bias to be the reasons for overreaction.

Newton C A da Costa, Jr. (1994) investigated overreaction hypotheses on set of data over the period from 1970 – 1989 for the Brazilian stock market using both market adjusted and the standard Sharpe – Linter CAPM adjusted returns. The observed asymmetric price reversals were more pronounced than those reported from the US markets. The investigation suggests that the risk cannot explain the anomaly.

Spyrou et al. examined investor reaction to market shocks in UK. The investors in large capitalisation stocks were found to react efficiently to information contained in market shocks. The mid cap and small cap investors underreact to information contained in extreme events and the effect is more prominent following positive shocks. This could not be explained by calendar effects, bid ask biases and unique global financial crisis but the behavioral models provide better explanation. Robert G Bowman and David Iversson (1998), examined the behavior of stock prices in New Zealand after a large weekly change in price and the findings suggested overreaction especially in the case of price declines. Reversals increase in magnitude as the initial price change increases and are more in the case of declines.

Eli Amir and Yoav Ganzach (1998) report that earnings forecasts are influenced by heuristics like leniency, representativeness and anchoring and adjustment. Leniency affects the level of prediction as well as its extremity and leads to overly optimistic predictions. Representativeness and anchoring and adjustment affect only the extremity of prediction. Dominance of these in prediction is based on the salience of the anchor. According to the authors forecast changes cause overreaction whereas the forecast revision leads to under-reaction. The forecast horizon has great impact on the anomalies dealt with in the paper.

Heng – Hsing Hsieh and Kathleen Hodnett (2011) examined the overreaction hypothesis on JSE Securities exchange. The results suggest stronger mean reversal for losers than winners implying prompt correction for losers than winners. The authors attribute this asymmetry to behavioral biases. Ruhani Ali et al. (2011) find strong evidence in favour of overreaction hypotheses in Malaysian stock market for periods of one to fifty two weeks. The overreaction is stronger for holding periods of one to four weeks. The looser stocks experience greater return reversals and overreaction is higher for low volume stocks. Gulin Vardar and Berna Okan (2008) examined the short term overreaction effect in Istanbul Stock Exchange and the results indicate significant price reversals for winner portfolios. The effect is more significant in the pre-financial crisis period than the post – crisis period.

Yangru Wu (2003) reported that pure momentum strategy produces weak profitability in Chinese stock market for intermediate holding periods of 6-9 months. Mean reversion is strong and pure contrarian strategy outperforms the pure momentum strategy. Yong Fang (2013) tested overreaction and underreaction in Chinese stock market using ANAR-

TGARCH model. From the results it is clear that irrespective of the size of the stock the market underreact to good news and overreacts to bad news and asymmetry in volatility is also not significant. The work throws light into the fact that the stocks in energy, industrial and finance sectors overreact to bad news, the effect being more significant for the finance sector. Also within the bull market the evidence for overreaction to bad news and underreaction to good news are significant but it is not so for the bear market.

Considering corporate events of seasoned equity offering, stock repurchase, stock financed acquisitions and cash financed acquisitions, Padma Kadiyala and P Raghavendra Rau (2002) reports that the investors underreact to prior information as well as the information conveyed by the event. The work couldn't find any evidence supporting the overreaction hypotheses. The empirical analysis by Hu Lin et al. (2013) from 2007 to 2011 shows the existence of stock market overreaction in China. Duration of test period affects the results of analysis. Gradual weakening of overreaction with prolonged test period is reported. Risk could not account for abnormal returns.

Jean Sebastin Michel (2014) reports that overreaction in US stock market depends on forecast and firm characteristics. The findings are consistent with the idea that investors under uncertainty overweight the recent experience leading to overreaction. The Regulation Fair Disclosure approved by US Securities and Exchange Commission in 2000 aiming to reduce the information disparity between individuals and institutions could not abolish the anomaly though the intensity has come down since its introduction.

OVERREACTION IN INDIAN STOCK MARKET

Dr. Mayank Joshipura provides strong evidence for short term momentum and long term contrarian profits in Indian stock market. The work proved that market overreaction followed by initial underreaction results in contrarian profits. As per the findings the momentum profit is evident in shorter horizons of six months and a year where as for longer tenure of about three years the contrarian profit is more prominent. The momentum and contrarian profits are not associated with risk adjustments. The claim of weak form of market efficiency can be discarded as strategies based on past returns could earn superior returns. Dr. Sitangshu Khatua and Dr. Hemant Kumar Pradhan (2014) addressed the impact of size, volatility and asymmetry in investors' overreaction to firm specific news. The study confirms that excess stock return depends on market volatility and the dependence is more significant for small firms. The overreaction is more on bad news and this point to informational asymmetry.

Vanita Tripathi and Shalini Aggerwal (2009) revealed the presence of statistically significant but asymmetric overreaction in Indian stock market considering overreaction in a long term perspective. The contrarian investment strategy is found to generate abnormal positive returns on market adjusted as well as risk adjusted basis. The pessimistic Indian investors show strong overreaction to bad news but do not overreact to good news. The work also challenges the informational efficiency of Indian stock market because of the possibility of contrarian investment strategy.

CHALLENGES TO OVERREACTION HYPOTHESIS AND ITS TESTING METHODS

To verify the overreaction hypotheses, DeBondt and Thaler (1985) focused on stocks, with extreme capital gain or losses over the period of last five years, of NYSE. They constructed two portfolios: Winner and Loser, composing of extreme high and low performing securities respectively. They could establish the presence of significant overreaction in stock market by establishing the winner loser effect in NYSE, assuming the risk level during the formation and test

periods to be the same. Chan (1988) and Ball and Kothari (1989) challenged the assumption. Zarowin (1989,1990) challenged the results and come out with evidence that the overreaction is just the manifestation of size effect. The risk adjustment and measurement biases were not taken into consideration in the model. Yet another suggestion against the overreaction model was that the return or performance reversals were significant during the month of January only.

Supriya Maheswari and Raj S Dhankar (2014) report that the studies on overreaction effect has been on the existence of short term and long term overreaction and on the reasons and sources of contrarian profits. There are conflicting and inclusive evidence on overreaction effect which are yet to be dealt with. Gishan Dissanaik (1994) argued that the arithmetic method that calculates the multiperiod return from the single period returns is inappropriate for the purpose. The estimated portfolio performance is sensitive to the method of computation and affects the findings. Multiplicative methods to cumulate the returns were reported to be superior.

CONCLUSIONS

The literature proves the existence of overreaction in various world markets at different periods of time. The method used in most of the studies is the one put forward by DeBondt and Thaler which cumulates the returns arithmetically. The results obtained are sensitive to the tools used and some authors' projects the geometrical way of cumulating returns to be superior. Extensive studies are concentrated mainly in developed economies. Many studies give contradicting proofs regarding the existence of overreaction. Experience, sophistication, demographic factors and behavioral biases cause anomalies in the investment world including overreaction and underreaction. The globalization and liberalization lead to great changes in investment behaviour and pattern throughout the world. Mayank Joshipura and Vanita Tripathi et al. report asymmetrical overreaction in India, the studies being conducted prior to 2011. The review shows that:

- Changes in investment pattern with regard to overreaction and underreaction during various investment horizons has to be dealt with in detail both in the developed and developing economies in the pre and post liberalization periods.
- The methods of testing overreaction and dependence of methods and tools used on the results are to be investigated in the global as well as Indian context.
- The existence of overreaction in India after 2011 is to be investigated and the reason for the anomaly, if it exists, is to be unearthed.

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