Testing the Contrarian Investment Strategy Using Holding Period Returns

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Abstract

This paper uses holding period returns in both forming and evaluating the efficacy of the standard long-term contrarian investment strategy. Holding period returns are used instead of cumulating returns due to the recent evidence showing that single period biases are cumulated when cumulating single period returns. Results from this study indicate that long-term price reversals are only significant for the winning portfolio. Both the losing and the arbitrage contrarian portfolios have statistically insignificant evaluation returns.

Introduction

This paper tests the theory that a contrarian investment strategy, in which an investor buys "losers" and shorts "winners", can be profitable. This study uses holding period returns in both forming a contrarian portfolio and measuring the portfolio's performance. Holding period returns are used instead of cumulating returns due to recent evidence showing that single period biases are cumulated when cumulating single period returns. Results from this study indicate that long-term price reversals are only significant for the winning portfolio. Both the losing and "arbitrage" contrarian portfolios have statistically insignificant evaluation period returns.

Literature Review

In their seminal article on the contrarian investment strategy, DeBondt and Thaler (1985) suggest that overreaction is present in the stock market. DeBondt and Thaler's proposition is based on evidence that individuals tend to overweight recent information and underweight prior information when revising beliefs. This weighting scheme is in violation of Bayes' rule of revising probabilities when presented with new information. If investors do indeed weight or react to new market information more than what would be prescribed by Bayes' rule, then they are said to "overreact" to new market information.

If markets do overreact, then stock prices will systematically overshoot their fundamental levels. Thus, an extreme movement in a stock's price is a result of market overreaction to information and will be followed by a subsequent price movement in the opposite direction as the market "corrects" its overreaction.

To test the overreaction hypothesis, DeBondt and Thaler form investment portfolios of "winners" and "losers." They find that three years after portfolio formation the portfolio of "losers" has earned about 25% more than the portfolio containing previous "winners." Thus, their empirical evidence is consistent with the hypothesis of stock market overreaction and indicates substantial weak form market inefficiencies.

Howe (1986) also suggests that investors should buy stocks that have experienced large price declines. While his results also indicate overreaction, Howe finds that a significant portion of the profits realized by using the contrarian strategy appear to occur within a short period of time after the large initial price increase.

More recently, Lehmann (1990) and Lo and MacKinlay (1990) have also documented significant short-term price reversals. Lehmann finds that stocks with negative returns in one week experience positive returns in the following week. This finding suggests that stocks that are "winners" and "losers" during one week experience sizeable return reversals during the following week; this phenomenon suggests that arbitrage profits are possible. DeLange (1998) provides evidence of traders using the contrarian investment strategy and Dreman (1998) encourages the use of a contrarian strategy.

In addition, Dreman and Lufkin (1997) examine the use of the contrarian strategy within an industry. When analyzing the performance of favored and less attractive stocks within an industry, they find that there is regular mispricing of stocks. Dreman and Lufkin's results indicate that the contrarian strategy does not bear excess risk and therefore conclude that risk is incapable of explaining this mispricing.

Presenting an opposite view to the overreaction hypothesis, Brown, Harlow and Tinic (1988), Chan (1988), and Ball and Khotari (1989) all argue that results supporting the over-reaction hypothesis are due to a misspecification of the return generating process. In particular, the systematic and unsystematic relationship between a firm and the market changes when large price movements occur. The results from these studies indicate that when risk is taken into account, little support for the overreaction hypothesis exists.

Also, Kryzanowski and Zhang (1992) suggest that positive profits resulting from the use of the contrarian investment strategy are limited to the U.S. stock market. When applied to the Canadian stock market, the DeBondt and Thaler framework does not produce favorable results. In, fact, instead of finding significant price reversals, Kryzanowski and Zhang find that the Canadian stock market exhibits significant price continuation behavior.

Conrad and Kaul (1993) also argue that the results provided by the DeBondt and Thaler framework are not valid. They assert that the reported excess returns are due to cumulating the bias of single period returns. Conard and Kaul state that due to Jensen's inequality, any statistical noise in stock prices will lead to upwardly biased single-period returns. Following the framework laid out by Blume and Stambaugh (1983), Conrad and Kaul document that if the single period biases are mitigated, the typical contrarian strategy of selling winners and buying losers generates statistically insignificant returns. In their study, however, Conrad and Kaul mitigate the accumulation of single period returns only during portfolio evaluation periods and not during the portfolio formation period.

Since biases in return calculations during portfolio creation could impact results just as much as biases in evaluation period return calculations, we evaluate the contrarian investment strategy attempting to mitigate biases in both periods. In particular, this study focuses on the contrarian investment strategy using a holding period perspective in both the formation and evaluation periods. Evaluating the contrarian strategy based upon holding period returns instead of cumulated single period returns would more closely resemble the returns confronting real world investors who may consider using the contrarian strategy.

Data and Methodology

Data

This study focuses on whether the contrarian investment strategy would have provided investors with a profitable trading rule in the U.S. market during the period beginning January 1928 and ending December 1992. Data for this study is extracted from the CRSP monthly return database.

All firms listed on the NYSE/AMEX CRSP database are potential candidates for analysis. However, to be included in the actual portfolios, a candidate firm must possess a calculable holding period return for both the formation and evaluation periods.[1]

Contrarian Strategy Methodology

The contrarian investment strategy is based on the theory that when the return on a particular firm's stock varies greatly from that of the market average, this variation is the result of market participants overreacting to some stimuli for that stock. That is, if the market receives good news about a particular firm, the market participants overemphasize this good news and bid up the price of the stock beyond what would be predicted by Bayes' rule. The overreaction of market players also results in their bidding stock prices down too far when there is bad news.

If market participants overreact to new information, then this overbidding will be corrected and significant price gains (or losses) will be reversed. Thus, the contrarian investment strategy suggests that a successful trading rule can be developed by relying solely on past performance. Investors would simply need to have a long position in past losers and a short position in past winners to reap profits. Therefore, tests of the contrarian investment strategy, such as the one developed in this paper, focus on choosing winners and losers, creating portfolios of these stocks, and evaluating whether an investor could have reaped profits by buying a portfolio of losers and shorting a portfolio of winners. Clearly, if this strategy is successful, the weak-firm efficient hypothesis is violated.[2]

Holding Period Returns

In this paper, holding period returns are used to choose stocks to include in the winning and losing portfolios and to evaluate the success of investing using the contrarian strategy. Conrad and Kaul suggest using a holding period return to mitigate the bias created by using a cumulative market adjusted return. A cumulative return is calculated by summing returns and biases that occur over many single periods. This calculation sums true returns plus biases which occur over many single periods. On the other hand, a holding period return is a single period return with one bias, not a sum of biases occurring over many single periods. Therefore, the amount of bias in a holding period return over any time frame will be much smaller than the bias associated with a return calculated by summing single period returns over the same time frame.

The holding period return is defined as:

$$HPR_{jn} = \prod_{i=1}^{n}(i+r_i) - 1. \qquad \text{(Equation 1)}$$

That is, firm j's 12 month-holding period return would be calculated as the product of its 12 monthly CRSP reported returns minus one. The market adjusted return for a particular formation or evaluation period is defined as:

$$MAHPR_{jt} = HPR_{jt} - MHPR_t. \qquad \text{(Equation 2)}$$

That is, firm j's market adjusted holding period return (MAHPR) for time t is calculated by subtracting the holding period return of the CRSP equally weighted market index for NYSE and AMEX stocks from the holding period return calculated by Equation 1. Therefore, a firm that has a holding period return that exceeds that of the holding period return of the market index for a given time period will have a positive MAHPR. But, a firm that has a holding period return that is less than that of the market index will have a negative MAHPR, even if the firm has a positive holding period return. Thus, market winners, stocks that outperform the market, will have positive MAHPR's and market losers, stocks that underperform the market, will have negative MAHPR's.

Portfolio Formation

Following the work of DeBondt and Thaler and Conrad and Kaul, we form winning and losing portfolios that consist of 35 firms each. However, firm selection in this study differs from that of the previous studies in that it is based upon market adjusted holding period returns rather than cumulating single period market adjusted returns. The 35 firms that had the highest MAHPR were included in the winning portfolio. The losing portfolio contains the 35 firms that had the lowest MAHPR.

We also follow the framework used by DeBondt and Thaler and Conrad and Kaul to form three-year non-overlapping periods to form winning and losing portfolios. In addition, we also form winning and losing portfolios by using non-overlapping formation periods of one and two years. Thus, our study includes 64 one-year formation periods, 33 two-year formation periods, and 22 three-year formation periods.

Empirical Results

Simulated returns using the contrarian investment strategy are presented in Table 1. This table demonstrates how the results would have differed if a one, two, or three year non-overlapping formation period were used and if the evaluation period were one, two, or three years. Only four of the results in the table are statistically significant. Interestingly, statistically significant results only occur for the winning portfolios. This would suggest that the only successful contrarian strategy would be to sell the stocks in the winning portfolios. Buying the losing portfolio does not seem to generate statistically significant returns and the arbitrage strategy of buying the losing portfolio and shorting the winning portfolio results in a statistically insignificant return. Once transaction costs are considered, these results suggest that no profitable arbitrage opportunities exist.

Also of note, no statistically significant results occur when the one-year evaluation period is used. This would suggest that the price reversal that does exist occurs slowly over time.

Conclusions

The results of this paper are counter to earlier research that suggests that a violation of the weak-form efficient market hypothesis exists and that a contrarian investment strategy could prove profitable. This difference is attributed to the use of holding period returns rather than cumulative single period returns in both portfolio formation and evaluation. Holding period returns provide a superior method for testing the contrarian investment strategy than do the cumulative single period returns used in previous studies because of the bias that occurs when single period returns are cumulated.

Results of this study appear to indicate that overreaction in the stock market only occurs when market players overreact to good news and drive a stock's price too high. After a period of euphoria, these price increases reverse. In this study, both the losing and arbitrage portfolios generate statistically insignificant results. One, two, and three year formation and evaluation periods were used to test the sensitivity of price reversals to time periods. It does not appear that the previously documented "risk-free" contrarian investment strategy can be sued to achieve positive abnormal returns. Rather, the results of this study support the existing literature that symmetric overreaction is not a consistent phenomenon in the stock market.

Further research should be done to test how sensitive these results are to the size of the portfolio formed. Since this study, as well as previous studies, focused on portfolios containing 35 stocks, future research might focus on smaller or larger portfolios. Also, this study looks at how well this strategy would have done if implemented over a 64 year time period. While the results over this long time period imply that no abnormal profits can be gained from a long-run contrarian investment strategy, there might be certain times in the market that the contrarian investment strategy may have earned abnormal profits.

Endnotes

1. This criteria introduces a survivorship bias. Chopra, Lokanishok and Ritter (1992) suggest that this survivorship bias can be mitigated. They propose using the CRSP equal weight index return for firms missing returns in evaluation periods. However, in this paper we do not include these firms so that a more realistic measurement of price reversal can be made.

2. It should be noted that in this paper we do not consider the implication of risk in either portfolio formulation or evaluation.

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TABLE 1					
CONTRARIAN INVESTMENT STRATEGY RETURNS					
MULTIPLE FORMATION AND EVALUATION PERIODS					
		EVALUATION PERIODS			
FORMATION PERIOD	*PORTFOLIO*	*1-YEAR*	*2-YEAR*	*3-YEAR*
1 Year	Winning	-0.054	-0.154**	-0.251***
1 Year	Losing	-0.066	0.038	0.085
1 Year	Arbitrage	-0.012	0.193	0.336
2 Years	Winning	-0.013	-0.065	-0.146*
2 Years	Losing	0.115	0.208	0.266
2 Years	Arbitrage	0.128	0.274	0.412
3 Years	Winning	-0.038	-0.168	-0.248**
3 Years	Losing	0.015	-0.098	0.030
3 Years	Arbitrage	0.053	0.069	0.278

*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.