Investors Irrationality in the US Equity Market: The Overreaction Effect

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Abstract

This paper focuses on the equity prices overreaction. Using a sample of all actively traded securities in the US equity markets, this paper assesses the investors' irrationality by calculating the returns associated with a contrarian trading strategy in different market segments. We utilized an improved methodology for calculating the over-reaction trade, namely, the counter-party swaps. The results show significant levels of profitability in the equity market as a whole, and distinct differences in magnitude and profitability when comparing specific market segments. Equity market segments like the S&P500, with brand name stocks, revert to their fundamental values faster relative to the market as a whole. That means that those segments exhibit less overreaction, which can be justified by the larger number of analysts and investors monitoring these stocks. This paper also offers theoretical justification for the investors' overreaction, using the expected utility theory's plunging and dumping.

JEL Classification: G02–Behavioral Finance, G11–investment decisions, G14–Market efficiency.

1. Introduction

The efficient market hypothesis has been one of the central theories to financial strategy. However, new theories have challenged the efficient market hypothesis. Out of these challenging theories, the overreaction hypothesis is one of the widest recognized and most important arguments. It hypothesizes that if stock prices exceed their fundamental value, as a result of excessive investor trading, (bull or bear trends) a price reversal should be predictable; see for instance Dissanaike (1997). According to Leland and Pyle (1977) a company's stock price is a reflection the total amount of information outstanding. If investors are not aware of this information in a timely manner, their view of the fair market price may not be a reflection of an underlying company's true fundamental value. With the rise in available trading platforms for private traders to place their own stock orders without the need to consult any financial intermediary, we theorize that the number of uninformed traders in recent years has increased, and as such the level of overreaction in the market place has also increased, and with the increase of technology within market places we also expect the speed of overreaction to have increased at a similar level.

Even though the topic of overreaction has already been researched in a good number of research papers, this study is unique as it utilizes an updated data set and it used an improved return measuring methodology to assess the magnitude of overreaction and the length of the holding time period resulting in the most profitable returns from a contrarian overreaction-based trading strategy.

In the return measuring equation we mimic an investment strategy similar to counter-party swaps. We compare several market segments within the US Equity market against each other to test for the existence of overreaction as well as to theorize about the composition of investor types among the market segments. Our results show that there is not only a significant level of overreaction occurring within the US equity market, but the results shift radically between market segments, indicating that there is a distinct separation between investor types within market segments.

The remaining part of the paper is organized as following; the following section explores the literature. Section 3 covers the data used in this research. Section 4 describes the methodology used to calculate the return, and the over-reaction of the equity market and the different holding periods used. Section 5 presents the empirical results that the paper reaches. Section 6 concludes the paper along with some points for future research.

2. Literature Review

According to the efficient market hypothesis, the price of a common stock reflects the total set of information available about the underlying company. When changes happen to this information set, through press releases or other forms of news announcements, it affects the underlying company and the value of their stock shifts to reflect this new set of information. See for instance Leland & Pyle (1977). Some of the reasons behind the over-reaction are trading on incomplete information sets. For examples of investors trading on incomplete information see La Blanc &Rachlinski (2005) and Kent, Hirshleifer , and Subrahmanyam (1998). By trading on incomplete information sets traders over-extend the fundamental value of the stock, and if there are enough uninformed investors in the market the stock stays over-extended for several periods.

Over-reaction was first described by De Bondt and Thaler (1985), they documented that stocks from the NYSE with poor return performance in the past 3-5 years achieved higher returns in the next 3-5 years than those with good historic performance in the last 3-5 years. They cited that this is evidence that investors underpriced the value of the company and once the forces of rational investors outweighed the irrational investors, the true-value of the underlying company was once again reflected in the market price of the stock.

Many researchers have investigated this hypothesis since De Bondt and Thaler popularized the concept in 1985. Dissanaike (1997, 1999, 2002) followed De Bondt and Thaler (1985) methodology and conducted overreaction tests in the UK market. However, Dissanaike believed that DE DeBondt and Thaler's results were skewed due to the inclusion of small firms in their data so in their paper they focused only on larger companies for the time frame between 1979 and 1991. Jegadeesh, (1990) and Fama, (1991) provided evidence that long-term returns can be predicted from short-term historic returns. Later Jegadeesh and Titman, (1993), found that stock price movements over the period of 6 to 12 months are a strong indicator of future returns. However, long-term performances of the past winner and loser stocks reveal that half of the excess returns in the year following the portfolio formation date dissipate within the following 2 years.

Power and Lonie, (1993), Clair and Thomas, (1995), and Dissanaike, (1997, 1999, 2002) add further evidence to previous research, stating that by combining accounting and market-based ratios to reveal a strong support for the overreaction hypothesis and suggest that a trading strategy of buy-and-hold loser shares and short-sell winner shares would have resulted in significant excess returns. However, Clair and Thomas, (1995) attribute the findings of the overreaction results to the fault that the previous researchers failed to account for the time-varying nature of risk, stating that these excess returns realized by buying past poor-performing stocks are reflecting the extreme risky nature of the asset and therefore not an accurate measure of investor over-reaction.

Chan, (1988), and Ball & Kothari, (1989) suggest that the time-varying characteristics of risk are a likely explanation to the results of the overreaction hypothesis as well. When applied to De Bondt and Thaler's study, Ball & Kothari show that the overreaction effects are insignificant. Zarowin, (1990) shows that when the overreaction effect is adjusted for the size effect, the results from De Bondt and Thaler's study are canceled out. Mazouz and Li, (2007) conduct the overreaction hypothesis on a different time-frame from De Bondt and Thaler's study and take into consideration the possibility of large-firm bias as pointed out in Dissanaike's studies (1997, 1999, 2002) as well as several other alternative explanations. They find that the overreaction phenomenon is still observable after controlling for the size effect and time-varying nature of risk.

The rest of the paper is structures as follows. Section 3 presents the data utilized in this paper along with their sources, frequencies, and time frame. Section 4 describes the paper's methodology used to measure the over-reaction magnitude and the length of time resulting in the highest return levels. Section 5 shows the empirical results as well as the theoretical justification to the finds, and section 6 concludes.

3. Data Selection

In this paper we used the US equity market as our data set due to its high liquidity and market breadth. We used historical stock prices for a segment of 10 years for all the publicly traded outstanding stocks within the US equity market. Our data set consists of monthly stock prices from May 2002 up to May 2012. This consists of9,249 companies. Those stocks are divided into different market segments: NYSE, NASDAQ OTC, Russell 1000, and S&P500. We performed the over-reaction tests to each segment separately, then on the NYSE minus the Russell 1000, and the NYSE minus the S&P500. Other segments of the market were also tested but not reported in this paper due to similarities in the results, see table 1.

To accommodate Clair and Thomas, (1995) concerns for not accounting for high risk attribution, we eliminate potential biases caused by companies with limited information by excluding those companies which trade in the US stock market through an ADR process. We also eliminated those companies with less than 10 years of historical prices. To account for Clair and Thomas, (1995)'s concern about the use of high risk investments, we further refine our base pool of stocksby eliminatingall those companies with a debt-to-equity ratio higher than 75% with the understanding that their default risk as well as their use of financial leverage is high. To then test the comparison between markets we segregated this base pool of stocks into specific exchanges and indices to represent a cross-section of the separate trading environments within the US equity market, as well as other scenarios.

Using monthly data, we test for overreaction for ten years utilizing holding periods ranging from one month up to two years. In this research, different holding periods were tested, ranging from one month to twenty-four month. Our holding periods stops at two years max due to Jegadeesh and Titman (1993) citing that single-period return profitability diminishes after two years. We tested the shorter holding periods as well to test our hypothesis that with an increase in technology, there is an equivalent increase in the speed and magnitude of the overreaction effect.

4. Methodology

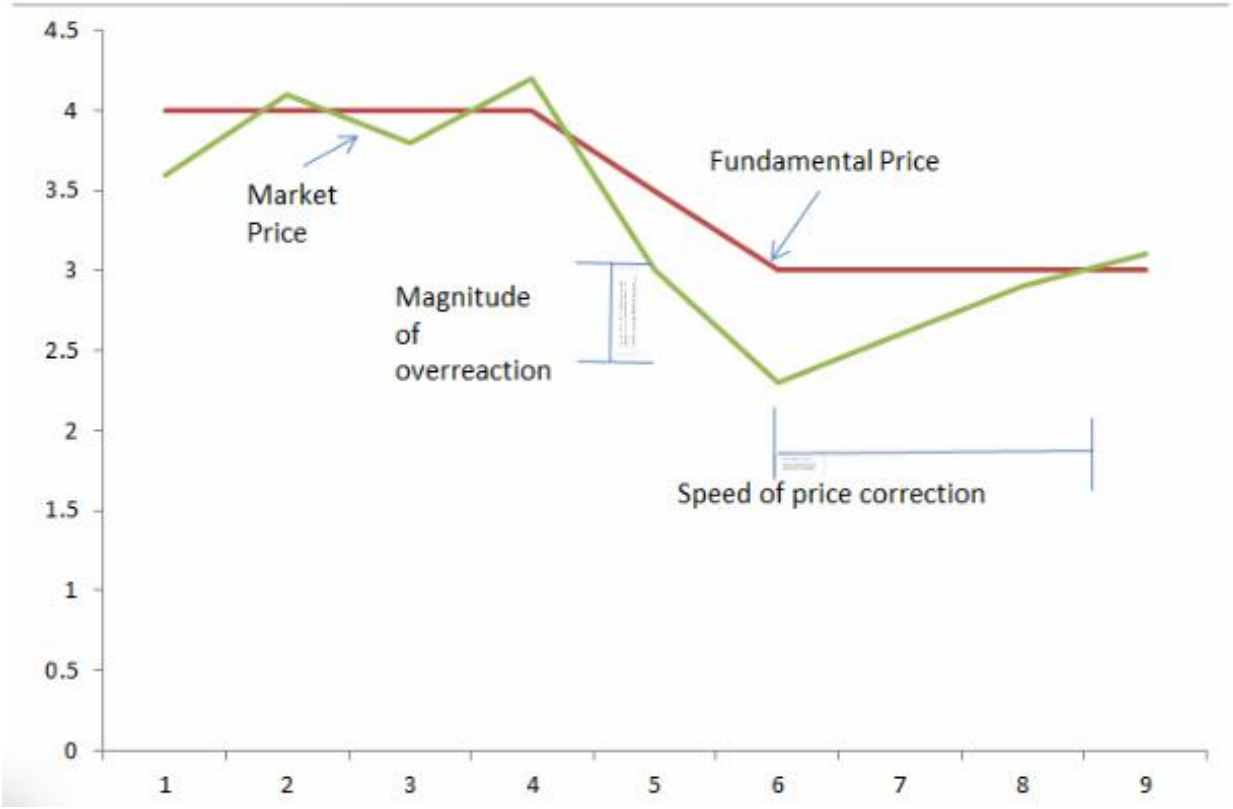
To assess the equity market over-reaction we utilize the following five-step methodology. First we started by screening the US equity market for stocks that fit our description as described in the previous section (eliminate the ADR and high debt/equity ratio stocks). The second step was to calculate the return levels from one period to the next. In the third step we used those return levels to rank all the equity securities from the highest to the lowest return. The fourth step was to buy the lowest quartile and hold it to calculate the buy-and-hold return. We also sell the highest quartile and hold it to calculate the sell-and-hold return. The fifth step is to repeat step four for different holding periods

There are several ways to measure returns associated with overreaction (step four). One of the most commonly used methods in the overreaction hypothesis testing is the buy-and-hold(BHR)methodology. In accordance toXilong and Ghysels (2010), investors' reaction is strongest for downward changes (bad news) in company's value as compared to upward changes (good news). In this paper, we utilize the BHR as an indicator to the magnitude of overreaction associated with the downside reaction to changes in the underlying company's value as well as sell-and-hold (SHR) for the upward reaction. The upward reaction is the reaction to good news. Our assumption in this paper is that due to the higher speed technologies, high frequency trading, and availability of online trading the market tend to over-react faster. So, with good news we expect the prices to be overstated after the announcement, so we use a contrarian strategy and we sell and hold the opposite goes for the bad news.

That is to say we analyzed the over-reaction to both good and bad news via measuring the magnitude of the price fluctuation as compared to measuring the speed of overreaction as measured by the time until a proper price correction is established. For an illustration see Graph 1.

Graph 1

The following curve illustrates the components of a theoretical overreaction movement of an underlying asset. The magnitude of overreaction is measured by the maximum fluctuation in price movement and the speed of price correction is calculated by the time required for a stock price to return to its "fundamental value"



Mazouz and Li (2007) as well as Conrad and Kaul (1993) both choose to implement BHR over Cumulative Abnormal Return (CAR) as a performance measure because it factors out variables such as taxation and focuses more on the long-term variability of the underlying company. The BHR is calculated for each individual stock by compounding the single-period returns over the length of the researchtime frame.

$$BHRi,t=1+Ri,1*1+Ri,2*...*1+Ri,T-1 \quad (1)$$

Where the BHR is the buy and hold return for an asset i, and R is the geometric return over the holding period. In a similar manner to the CAR model, the abnormal returns are calculated and then averaged to give us a measure of performance indicators of the "winner" and "loser" portfolios in the same fashion as before.

$$ABHARW,t=1ni=1nBHRW:i,t-1Nj=1NBHRm:j,t \quad (2)$$

Where ABHAR is the average buy-and-hold abnormal return, ABHARW(L) is the Buy-and-Hold return for the winner (or loser) portfolios, NBHRm is the Buy-and-Hold return for the market.

For our research, we add improvements to this model to capture the upside skew generated by single-period returns over an extended period (Conrad and Kaul, 1993). Utilizing an investment strategy similar to counter-party swaps we invest a fixed amount every period and generate the level of return associated with the security comprised of the 100 bottom performing stocks from the previous period and receive after one holding-period a variable amount of revenue. The securities are ranked on their returns, calculated by:

$$ri,t=\ln(Pi,tPi,t-1) \quad (3)$$

The securities are ranked based on their returns and then the periodic return on the contrarian BHR strategy is calculated by taking the cumulative cost of purchasing the bottom ranked securities compared to the cumulative cost of selling the securities after one holding period.

$$BHRi,t= i=1LUPi,t-Pi,t-1Pi,t-1 \quad (4)$$

Where L_U is the upper limit number of stocks traded each period. To calculate the return of the entire investment, a fixed amount is invested at this rate each period, but not reinvested across periods in order to take advantage of the upside bias introduced in investing in single-period risky assets over a long-term time frame. To adjust for the time-varying nature of risk, we take the present value of both the fixed amount invested each period (t=0 to t=N-1) as well as the variable amount received each period (t=1 to t=N), utilizing the 3 month Treasury Bill rates available at each investment period.

$$t=0NFInvt*BHRt1+TBrt-1t12 \quad (5)$$

5. Empirical Results and Theatrical Justification

Our research focuses on the impact of good and bad news as an indicator of potential overreaction within a market segment. Our assumption is that uninformed investors tend to over-react news leading to the change in fundamental value, therefore while the model can be utilized to test for overreaction to the top number of performing results, we focus only on the bottom performing stocks within a market segment. By testing the US equity markets for overreaction along periodic investment rebalancing periods we can develop a proxy to measure the speed in which information diffuses across a particular market segment, as well as infer the composition of investor types within the market as it applies to popular behavioral finance theories.

As noted in Wang &Xie's (2010) on the Information Diffusion and Overreaction in the Chinese Market, behavioral finance theory categorizes investors into two groups; News Watchers and Momentum Traders. News watchers are those investors who closely follow the announcements of a few companies and have a better understanding of the true impact on changes in information sets regarding those companies. On the other hand, Momentum Traders are those investors who trade in many companies without closely following the particular news, but rather follow the trends of the market. They cite that it is the momentum traders that contribute to the overreaction of a market.

For our research we categorize investors into two more general categories, informed investors and uninformed investors. Informed investors are those traders who have an understanding of the fundamental value of a company, including soon-after changes in information sets. Uninformed investors are those traders who are trading on companies for a reason other than the change in information set (momentum, name brand bias, etc.). To measure if a particular market segment has a significant number of uninformed investors we calculate the level of profitability associated with a contrarian buy-and-hold trading strategy for the 100 worst performing stocks within a market segment. By the theory of the efficient market hypothesis, if there are a significant number of informed traders within a market, the amount of time between the release of new information and the correction of the market price of a stock should not allow for a profitable level of return from a contrarian trading strategy (Dissanaike, 1997). Table 1 shows the different segments of the market used in this research along with their return for different holding periods.

Table 1

Plot of market segment returns across a series of holding periods illustrated the fluctuations of returns associated with different holding lengths and the discrepancy between ideal holding periods among separate market segments. The highest holding period return is highlighted in green. The maximum holding period for all two years is highlighted in blue – if different than the green holding period associated with that market segment.

	1M	2M	3M	4M	5M	6M	7M	8M	9M	10M	11M	12M	18M	24M
All Stocks	0.706 74	0.497 419	0.549 859	0.531 672	0.504 824	0.524 989	0.664 607	0.613 406	0.597 658	0.561 956	0.420 949	0.471 49	0.408 71	-0.143 34
Filtered Stocks	0.104 528	0.103 181	0.400 406	0.261 352	0.168 23	0.112 443	0.104 886	0.133 762	0.062 119	0.005 096	-0.061 8	-0.093 57	-0.133 86	-0.378 22
NYSE Stocks	0.010 909	0.022 358	0.028 395	0.038 36	0.050 452	0.057 192	0.066 454	0.072 924	0.085 524	0.099 018	0.102 936	0.113 232	0.160 053	0.176 009
Regional Markets	-0.003 99	-0.000 98	-0.003 62	-0.007 51	-0.003 66	-0.000 25	-0.000 77	-0.007 17	-0.006 15	-0.002 31	-0.004 35	-0.002 32	0.024 976	0.047 797
NASDAQ	0.064 967	0.031 762	-0.009 08	0.000 968	-0.000 19	-0.023 84	-0.029 82	-0.062 03	-0.083 59	-0.078 64	-0.111 4	-0.147 16	-0.190 26	-0.311 64
NYSE & AMEX	0.019 606	0.018 795	0.020 756	0.017 692	0.018 003	0.021 751	0.029 791	0.028 093	0.036 534	0.044 96	0.051 93	0.052 977	0.139 719	0.202 464
OTC Market	0.217 889	0.324 685	0.637 072	0.433 538	0.466 064	0.344 313	0.337 765	0.369 499	0.333 093	0.171 122	0.006 868	0.106 845	-0.113 73	-0.268 77
S&P 500 Stocks	0.007 385	0.014 423	0.019 508	0.024 769	0.031 947	0.036 673	0.045 244	0.051 727	0.056 793	0.066 97	0.068 875	0.077 235	0.114 808	0.134 124
Fortune500 Stocks	0.003 297	0.016 203	0.022 275	0.028 859	0.038 176	0.047 636	0.051 565	0.060 445	0.073 881	0.084 652	0.086 443	0.098 12	0.138 907	0.136 167
S&P Index	0.001 965	0.003 581	0.004 518	0.005 973	0.007 434	0.008 629	0.010 824	0.012 254	0.013 888	0.016 122	0.018 088	0.019 864	0.031 142	0.033 035

We hypothesize that we will find a stronger level of overreaction than what was documented in the literaturedue to the popularization of online trading, the increased level and popularity of high frequency trading, as well as a high degree of differentiation between the market segments. If this is true, we speculate that it is due to the separation between highly online-based trading markets and those markets that are still mainly carried out in the traditional manner-utilizing stockbrokers, who would impose their own understanding of financial markets and rational investing into the orders placed by individuals. Among the separate market segments analyzed we expected to see a significant overreaction effect for those markets where private traders have easier access to market information and can trade quickly and easily on their own.

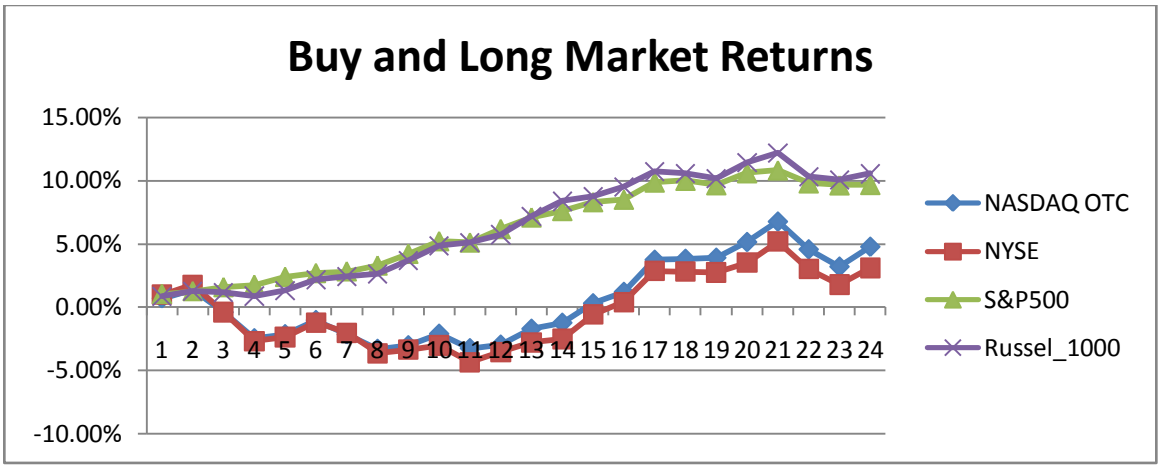
We find that the resulting data is widely diverse in both magnitude and direction, and shows significantly high levels of return for several markets indicating the presence of overreaction in the US equity markets. These results confirm our hypothesis developed in the methodology. The level of returns for the varying holding periods for all 9,459 commonly traded stocks within the US equity market indicate that the over-reaction effect most commonly occurs at the fastest tested interval of one month. This means that the highest level of returns associated with the contrarian Buy-and-Hold trading strategy are highest for purchasing the bottom-performing stocks for each period and selling them after holding for one month. There is also a significant level of profits for the subsequently longer holding periods, and we can see that consistent with the results of Jegadeesh and Titman (1993) the profitability for all market segments drops to insignificant levels as it approaches holding periods of two years. This indicates that the average investor active within the US equity market expresses a significant amount of investor irrationality, but the efficiencies of the market are fairly quick to correct for these irrational behaviors.

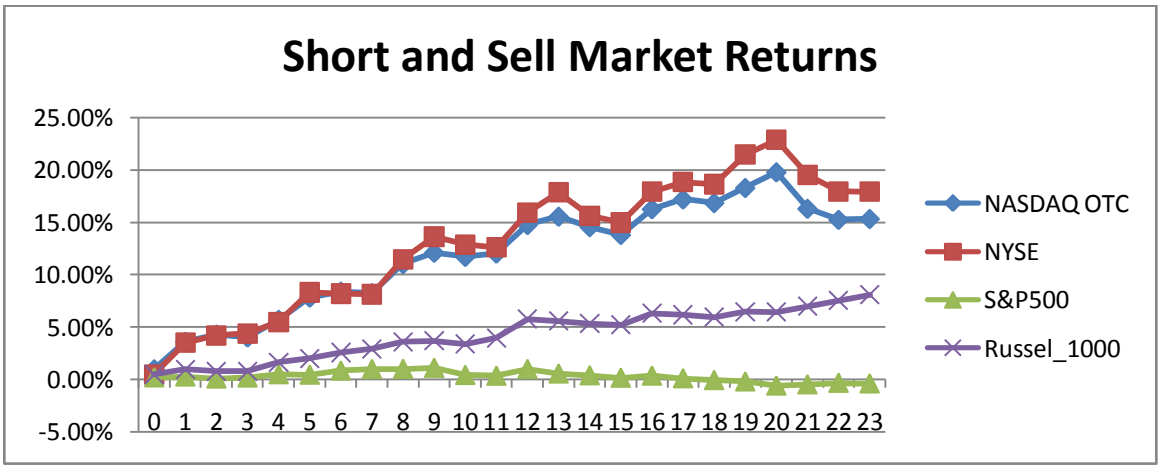
By analyzing the entire market selection (all commonly traded stocks), our results suggest there is significant evidence supporting the conclusion that the US market exhibits a fast and strong overreaction effect.

The rebalancing time frame with the maximum return indicates that the US equity market has a fast-paced time frame when compared to other select markets. This is also an indicator of the amount of time it takes for a firm to "rebound" from performing poorly to performing favorably. For this paper, we theorize that rebalancing time frame with the highest level of return for a given market indicates the ideal frequency of rebalancing for an overreaction effect to occur within the specific market. If the favorable turnaround time were a result of macro-economic forces then we would expect to see the same results in the complementary market as well.

Graph 2

The returns for different trading strategies for the following market segments: S&P500, NYSE, NASDAQ OTC, and Russell 1000. The first panel of the graph shows the buy and hold return trading strategy (buying the lowest percentile of stocks - losers), while the second panel shows the short and sell trading strategy (selling the highest percentile of stocks - winners).





On average the results for all commonly traded US stocks exhibit an ideal turnaround period of one month, the shortest time frame tested for. This supports our hypothesis that the developed stock markets of the US, with faster methods of communication and infrastructure than most developing markets, would express an overreaction effect on a much faster time-frame. This information can be utilized by investment managers as an indicator for the ideal, market-specific, time period in which they should re-balance their portfolios to avoid any unnecessary losses due to temporarily poor-performing stocks within their investment pool.

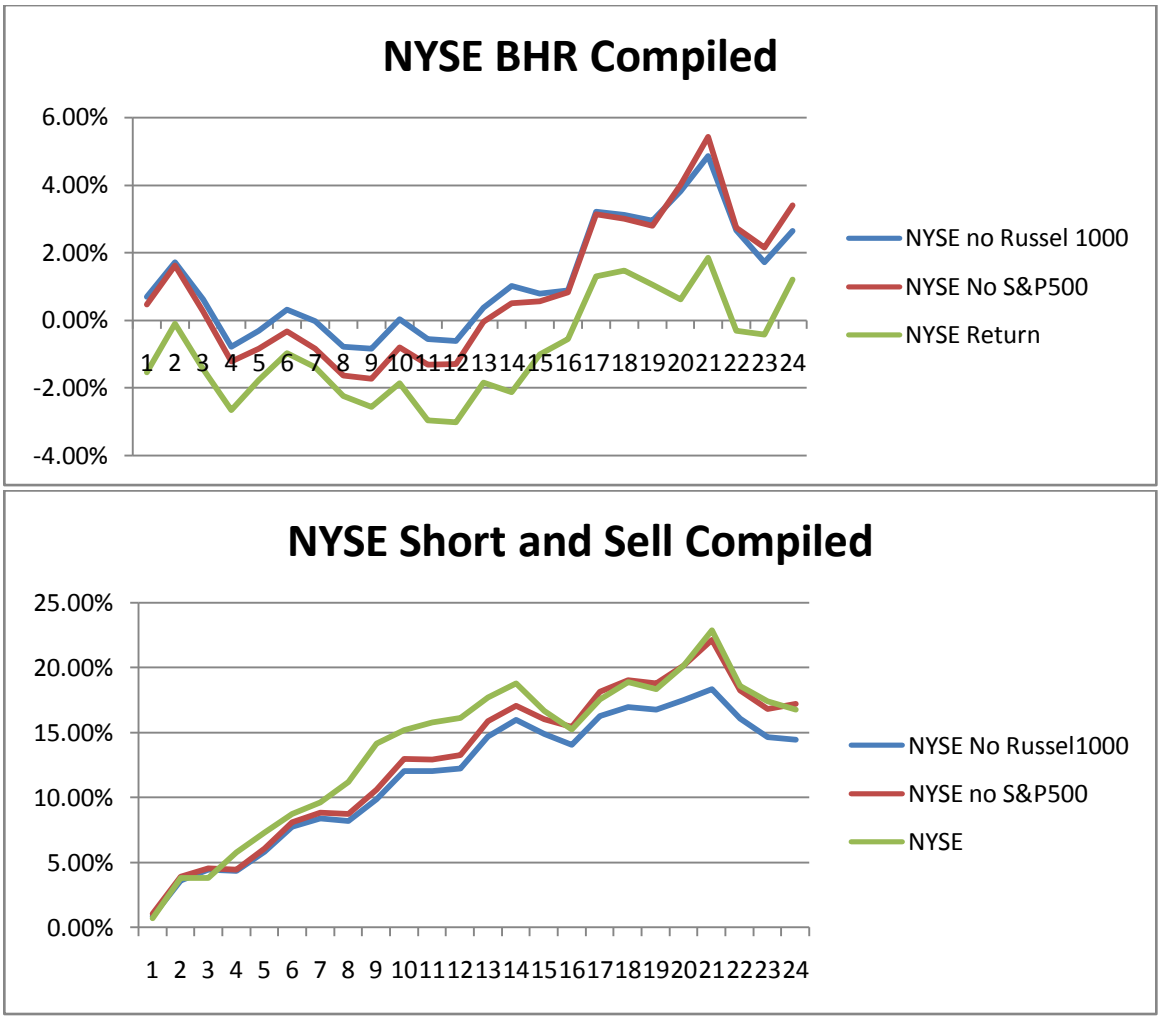
When compared by cross-section, we can see a distinct separation in the characteristics of investors' between market segments. We see from graph 1 that several market segments only exhibit a gradual increase to reflect the general level of return from the market, time-value of money and inflation.

It also should be noted that it is very likely that the markets, which have the highest returns for an investment horizon of two years, are not reflecting a long-term overreaction effect but rather are displaying the general increase in profits associated with the general market trend. When adjusted for the level of excess return over the benchmark of the S&P500 Index return, the level of profitability drops to a negligible amount (not capable to overcome the transaction costs associated with the trading strategy).

The most likely explanation is these markets have a high enough number of educated traders and analysts to successfully adjust for any overreaction effect that would occur before our smallest increment of measurement. If the data were to be re-analyzed utilizing a significantly smaller investment horizon there might be a higher level of overreaction. However, this strategy is not practical for an applied trading strategy due to the extreme transaction costs associated with the high level of transactions as well as the length of time necessary to complete a stock order being too lengthy to guarantee completion before the overreaction effect has been eliminated.

Graph 3

The returns for different trading strategies for the following market segments: NYSE, NYSE without the S&P500, and NYSE without the Russell 1000. The first panel of the graph shows the buy and hold return trading strategy (buying the lowest percentile of stocks - losers), while the second panel shows the short and sell trading strategy (selling the highest percentile of stocks - winners).



However, comparing two market segments such as OTC market to the S&P Index we can see a clear differentiation between the characteristics of the investors that actively trade within those market segments.

To provide further evidence that certain markets experience a wider range of investor irrationality we compare a market's trend to all other stocks not traded within that market utilizing the same investment holding period and time-frame. It is clear that while the short-term profitability from overreaction-based contrarian trading is not significantly profitable for several markets; their anti-market segments remain significantly profitable. This supports the hypothesis that certain markets contain a higher level of informed investors while the market as a whole contains a significant level of uninformed investors.

One potential explanation for this type of "plunging and dumping" behavior associated with the onset of a potential "over-reaction" movement can be associated with a type of utility theory highlighted in Horvath and Scott (1985). If investors have an expressed utility function that is cubic, or higher, in order to capture the direction of Skew and other higher moments, then there would be more than one potential "maximum expected utility" associated with different combinations of the underlying assets. Assuming two underlying assets X and Y, and basing an investor's utility function on return, variance and skew, the investors expected utility could be expressed as (Horvath and Scott 1985):

$$E(U) = b_0 + b_1 R + b_2 R^2 + b_3 R^3 \quad (6)$$

Where

$$b_0 = a_0 + a_1\mu_Y + a_2(\sigma_Y^2 + \mu_Y^2) + a_3(\lambda_Y - 3\mu_Y\sigma_Y^2 - \mu_Y^3)$$

$$b_1 = a_1(\mu_X - \mu_Y) + 2a_2(\mu_X\mu_Y - \sigma_Y^2 + \mu_Y^2) + 3a_3[-\lambda_Y - \sigma_Y^2(\mu_X + \mu_Y) - \mu_Y^2(\mu_X - \mu_Y)]$$

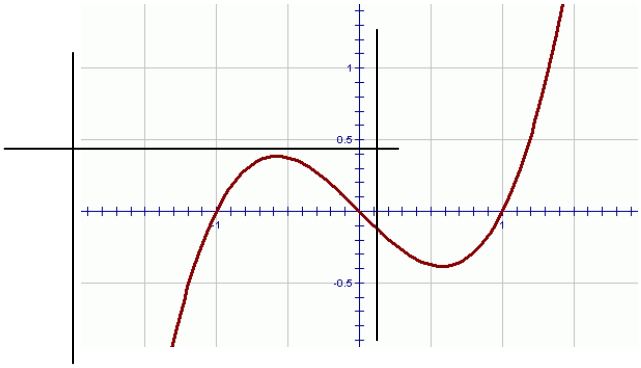
$$b_2 = a_2(\sigma_X^2 + \sigma_Y^2 + (\mu_X - \mu_Y))^2 + 3a_3[\lambda_Y - \mu_Y(\sigma_X^2 + \sigma_Y^2) + \sigma_Y^2(\mu_X - \mu_Y) + \mu_Y(\mu_X - \mu_Y)^2]$$

$$b_3 = a_3[(\lambda_X - \lambda_Y) - 3(\mu_X - \mu_Y)(\sigma_X^2 + \sigma_Y^2) + (\mu_X - \mu_Y)^3]$$

This will result in a cubic function that can have multiple maximum and minimum points along the expected utility curve.

Graph 4

Cubic Expected Utility Function: Describing the potential for investors to have several maximum utility return points among combinations of underlying assets. One potential explanation for this type of "plunging and dumping" behavior associated with the onset of a potential "over-reaction" movement can be associated with a type of utility theory



If the utility curve is bounded, we can have two maximum points along the curve but achieved by significantly different compositions of assets. In the event of this situation and an investor receives news on one of the underlying assets that marginally reduce its expected utility, shifting the curve in one direction or another by a marginal account, the investor would be inclined to switch their holdings significantly in order to achieve a marginally higher expected return. If rational investors have a similar utility structure and all investors receive the same news at approximately the same time, then we would expect to see a quickening dumping of a particular stock in order to achieve a slightly higher expected return. This dumping behavior can trigger an over-reaction by the mass of investors due to the spike in trend-setting investors suddenly trying to move a significant portion of their stocks based on a minimal amount of information.

6. Conclusion

This research assesses the level of over-reaction in the US equity market. We hypothesize that due to the increased frequency trading and the wide spread of online trading, more and more traders will tend to trade on incomplete or inaccurate information. Thus leading to over-reaction. We also hypothesized that the magnitude of the over-reaction effect will be different in different segments of the markets. This is mainly due to the fact that some segments are more monitored than others. For example the S&P500 is composed of well-known 500 publicly traded firms that a larger percentage of traders and analysts are watching carefully. So, over-reaction tends to be less often and when it exists, it does not last long (the price revert back to the fundamental price by the informed traders).

Using an improved methodology (counter-party swaps) and a recent data set, our results confirm our hypothesis. The results showed significant level of returns when using a contrarian trading strategy, thus, supporting the notion that over-reaction does exist. Further, when comparing different market segments, the over-reaction tend to be higher for firms that are less monitored by traders and analysts, thus supporting the finds of Wang &Xie's (2010). This finds simply means that a trader has more chances of making profits when he trades less monitored assets.

Unlike the results documented in the literature, our results showed higher abnormal excess return for over-reaction to positive news, as compared to over-reaction to bad news. It is worth noting that our results did not consider the following aspects in our analysis: lending rates, tax effects, transaction cost, and risk factors. Those factors were not considered in Wang & Xie's (2010) as well.

Future Research

By calculating the investment return based on a fixed number of bottom-performing stocks each period, to measure the feasibility of a trading strategy we can easily take into consideration the deduction from profits incurred from transaction costs. In the market today a private investor can open an online trading account with flat-rate transaction costs of only $7 per bundle. To include the deduction of costs per period simply include $(7*L_U) per stock transaction. It should be noted that for those periods in which you are both buying the bottom-performing stocks and selling the previous holding-periods stocks these transaction costs will be incurred twice.

It can also be inferred from our comparison between the market segments and their anti-market segments that we have yet to find a particular segment in which the magnitude of profitability from the entire stock selection is captured. This indicates that there is either a segment in which there is a stronger filtering process for capturing a market cross-section in which the composition of uninformed investors and irrational investors are higher, or that the interactions between uninformed and irrational investors is too dynamic to be captured in a fixed market filtration system and by not limiting our exposure to a single market segment is the only method for capturing those highest returns associated with over-reaction.

References

Ball, R. and Kothari, S. P. (1989) Nonstationary expected returns: implications for tests of market efficiency and serial correlations in returns, *Journal of Financial Economics*, **25**, 51-74

Chan, K. C. (1988) On the contrarian investment strategy, *Journal of Business*, **61**, 147-64

Chan, K. C., Jegadeesh N., and Josef Lakonishok, 1996, "Momentum Strategies," *Journal of Finance*, 51, 1681-1713

Chen, Xilong , and Eric Ghysels. "News—Good or Bad—and Its Impact on Volatility Predictions over Multiple Horizons." *Review of Financial Studies* 24.1 (2010): 46-81. Print.

Clare, A. and Thomas, S. (1995) The overreaction hypothesis and the UK stock market, *Journal of Business Finance Accounting*, **22,** 961-73.

Conrad, J, and Kaul, G. (1993) The returns to long term winners and losers: bid-ask biases or biases in computed returns, *Journal of Finance*, **48**¸ 39-63.

Conrad, J., and Kaul, G., 1993, "Long-Term Market Overreaction or Biases in Computed Returns?," *Journal of Finance*, 39-63

Daniel, Kent D., Hirshleifer, David A. and Subrahmanyam, Avanidhar (2001) Overconfidence, Arbitrage, and Equilibrium Asset Pricing. *Journal of Finance*, Vol. 56, No. 3, pp. 921-965, June. Available at SSRN: http://ssrn.com/abstract=1288932

Daniel, Kent , David Hirshleifer , and AvanidharSubrahmanyam(1998). "Investor Psychology and Security Market under- and Overreactions." *The Journal of Finance* 53.6: 1839-1885 . Print.

De Bondt, W. F. M. and Thaler, R. H. (1985) Does the stock market overreact?,*Journal of Finance*¸**40**, 793-805.

Dissanaike, G. (1997) Do stock market investors overreact?,*Journal of Business Finance and Accounting,* **24**¸27-49.

Dissanaike, G. (1999) Long-term stock price reversals in the UK: evidence from regression tests, *British Accounting Review,* **31,** 373-85.

Dissanaike, G. (2002) Does the size effect explain the UK winner-loser effect?,*Journal of Business and Accounting*¸**29**, 139-54.

Fama, E. F. (1991) Efficient capital markets: II, *Journal of Finance*, ***5,*** 1575-616.

Horvath, P. & Scott, R., (1985). "An Expected Utility Explanation of Plunging and Dumping Behavior," *The Financial Review*, Eastern Finance Association, vol. 20(2), pages 219-28, May.

Jegadeesh, N. (1990) Evidence of predictable behavior of security returns, *Journal of Finance*¸**45**, 881-99.

Jegadeesh, N. and Titman, S. (1993) Returns to buying winners and selling losers: implications for stock market efficiency, *Journal of Finance*¸**48,** 65-91.

La Blanc, Gregory and Rachlinski, Jeffrey J. (2005) "In Praise of Investor Irrationality". *Cornell Law Faculty Publications*. Paper 21. http://scholarship.law.cornell.edu/lsrp_papers/21

Leland, Hayne, and David Pyle(1977): "Informational Asymmetries, Financial Structure, and Financial Intermediation." *The Journal of Finance* 32.2 371-387.*JSTOR*. Web. 29 Apr. 2011.

Mazouz, K and Li, X. (2007) "The overreaction hypothesis in the UK market: Empirical analysis", *Applied Financial Economics*, **17,** 1101-1111.

Power, D. M. and Lonie, A. A. (1993) "The overreaction effect: anomaly of the 1980s?",*British Accounting Review,* **25**, 325-66.

Wang, C. and Xie L. (2010) "Information Diffusion and Overreaction: Evidence from the Chinese Stock Market",*Emerging Markets Finance and Trade*, **46**, 80-100

Zarowin, P.(1990), "Size Seasonality, and Stock Market Overreaction," *Journal of Financial and Quantitative Analysis*, 25, 113-125