To MTA Members, Affiliates, and the technical analysis community,

On October 19th, the Market Technicians Association (MTA) selected my submission, “Mutual Fund Cash Reserves, the Risk-Free Rate, and Stock Market Performance” for the 2004 Charles H. Dow Award. Over the course of the last month, the Dow Award committee and I have been preparing the paper for public release on the MTA’s website and other media outlets. Last week, the paper was officially released to the public and posted on the MTA’s website.

Since the public release of the paper, it has come to my attention through contacts in the technical analysis community and by Ross Leinweber, Chairman of the Charles H. Dow Award competition, that my research is similar to work authored by Norman G. Fosback and originally published in 1976 in a book entitled, “Stock Market Logic: A Sophisticated Approach to Profits on Wall Street.” I have reviewed Mr. Fosback’s book and agree that the general nature of the research is similar, but believe that I have extended the concept of relating interest rates to mutual fund cash reserves in several sophisticated and transparent ways.

I would like to send a clear message to the MTA Members, Affiliates, and the technical analysis community that I was unaware of this research prior to authoring my submission for the Dow Award competition. I also contacted several technical analysts and traders to confirm that this type of research was unique in nature. None of these individuals referred me to Mr. Fosback’s work.

In order to credit Mr. Fosback with his work and reconcile the issue, I have submitted an amended version of my paper citing Mr. Fosback’s book. This amended version will replace the original submission posted on the website and be the copy made available to the public.

I would like to thank the technical analysis community for informing me of Mr. Fosback’s research and the feedback regarding the situation. This type of interest and engagement by fellow technicians is essential in defending the work of technical analysts worldwide and creating respect for our discipline throughout the financial industry.

I hope you enjoy reading my paper. I am proud to be the winner of the 2004 Charles H. Dow Award.

Respectfully,

Jason Goepfert
To MTA Members, Affiliates, and the technical analysis community,

Since selecting the research and paper submission of Jason Goepfert, “Mutual Fund Cash Reserves, the Risk-Free Rate, and Stock Market Performance” as the 2004 Charles H. Dow Award, the Dow Award committee was informed of similarities with work authored by Norman G. Fosback and originally published in 1976 in a book entitled, Stock Market Logic: A Sophisticated Approach to Profits on Wall Street.

Over the course of the last week, the Dow Award committee has reviewed the situation and the research of Mr. Fosback to answer the following questions:

1. Is there any evidence to suggest plagiarism?
2. Is Mr. Goepfert’s paper still considered a significant extension of an established work of technical analysis? If so, does the committee believe his paper should remain the recipient of the 2004 Charles H. Dow Award?

The Dow Award committee has found no evidence to suggest there was any type of plagiarism of Mr. Fosback’s work. Mr. Goepfert has stated that he was unaware of Mr. Fosback’s research at the time of publication of his paper. He has also stated that he solicited the opinions of other technicians and traders to verify that the subject matter of his paper was unique and received no reference to Mr. Fosback’s research.

Regarding the second question, the committee believes that despite the general similarities of relating interest rates to mutual fund cash reserves, Mr. Goepfert’s paper has broadened the body of knowledge for technical analysts. The Dow Award judges concluded that the qualities that significantly extended this particular body of research of technical analysis are: the transparency and comprehensiveness in which the methodology and relationship were described and explored, the statistical rigor in back-testing and results, and out-of-sample tests used to ensure consistency over extended time periods.

The Dow Award committee therefore finds no reason to change its decision made in October and awards the 2004 Charles H. Dow Award to Jason Goepfert. To address the issue of crediting Mr. Fosback with his work in this subject area, Mr. Goepfert has submitted an amended version of his paper with proper notation of Mr. Fosback’s book. This revised version of the paper will replace the current version posted on the MTA website and will be the version distributed by the MTA to the public and media in the future.

Comments and questions have also been raised regarding the judging panel’s role in this matter. I want to reassure the technical analyst community that great thought has gone into the selection of individuals to serve on the judging panel. The panel consists of 7 members of the Market Technicians Association that possess a deep and broad knowledge of technical analysis and its history. Judges come from varied parts of the financial community, varied occupations, and varied ages to provide a comprehensive filter of knowledge and experience from which to select an annual Charles H. Dow Award winner. I feel quite confident in the abilities of these individuals and their reputations as respected technicians within our larger analyst community.

Obviously, the challenge for these seven individuals is enormous each year. They are required to pool each other’s experience and efforts to survey a body of knowledge which is extremely vast and disaggregated. It would be my hope that the technical analyst community as a whole will work together to create a unified “body of knowledge” that can be used for endeavors such as the Charles H. Dow Award going forward.

In recognition of the challenges confronting the judges and the inherent vulnerabilities embedded in these types of situations, I will implement an additional layer of review during the selection process starting in 2005.

I want to thank the MTA members and affiliates, the AAPTA and Bollinger email lists, Jason Goepfert, George Schade, and the judging panel for their active interest, feedback and patience in resolving this manner. With the help of these individuals, the Dow Award committee has been allowed to resolve the issue in an efficient and prudent manner and maintain the integrity of the Charles H. Dow Award.

Respectfully,

Ross G. Leinweber, Chairman
Charles H. Dow Award Committee
The most basic tenet of contrarian investing is that one should buy when others are fearful and sell when they are eager to buy.

The definitions of “fearful” and “eager” are open to interpretation, but one assumption that has persisted over the decades is that low levels of cash reserves held at mutual fund firms was a sign of excessive optimism. Looking at the relationship between cash reserves and the risk-free rate of return, however, suggests that portfolio manager sentiment is not the only—or perhaps even the largest—component of cash reserve levels. By backing out the effects of interest rates, we can get a better feel for the sentiment of these portfolio managers, as well as potential stock market returns going forward.

**Cash Reserves vs. the Risk-Free Rate**

As of June 2004, liquid assets of stock mutual funds, expressed as a percentage of total net assets, stood at 4.3%. This level of reserves, relative to total assets, was one of the lowest in the history of reported data. At the time the figures were released, there was a great deal of media attention focused on the idea that fund managers in the United States were overly enthusiastic about the prospect of future gains in the equities market, and thus the market was likely going to have difficulty making significant advances. The logic of such an argument may be sound, but a look into another, perhaps more important, factor sheds some light on why cash levels at mutual funds were so low. There are many reasons why a fund would hold a low level of cash:

- They believe the market is going higher and want to be as fully invested as possible.
- They use derivative securities (such as futures and options) and don’t need actual cash on hand in order to hedge their portfolios.
- Their charter (or a mandate from investors or management) requires that they remain as invested as possible, having enough cash on hand only to meet expected redemptions. They are not expected to time the market, only find good stocks. With the improved reporting systems now in place at some fund firms, portfolio managers can see redemptions on virtually a real-time basis, reducing the likelihood that they will wake up one day with a cash crunch.
- The increased influence of index funds precludes market timing. These managers aren’t expected to give investors a positive absolute return, they are only expected to beat their respective benchmark index. Having a high level of cash increases their chances of underperforming their benchmark in a rising market.
- There aren’t many other instruments available that would give their investors an acceptable reward for the risk they are taking.

It is on that last point that I wish to focus. When short-term interest rates are high, mutual funds have an incentive to hold cash. If there is a risk-free investment that will pay an 8% return, is it unreasonable to expect a fund manager to shift funds there as opposed to risking them in the equities market where they may get an 8% return during a good year, but with a great deal more risk? Most of us would surely switch to the risk-free opportunity. For these purposes, we will use the yield on 90-day Treasury Bills as the risk-free rate of return. This assumption is certainly supported by the numbers. From 1954 through 2003, the correlation between mutual fund cash levels and the 90-day T-Bill rate was 0.74, which means that the prevailing level of interest rates can theoretically explain 55% of why mutual fund cash levels are where they are. Figure 1 shows this correlation—there is a clear upward slope to the scatter plot, with minimal variation.

**Figure 1**

**Correlation Between Cash Level and Risk-Free Rate**

1954 - 2003

With 591 data points, the probability of the correlation between cash levels and interest rates being due to chance alone is essentially zero. Using regression analysis, we can see the relationship between interest rates and cash reserves. This will allow us to determine what an “appropriate” level of cash reserves may be given a certain interest rate, which we can then use to compare to current cash reserves. If current reserves are too low given prevailing rates, then fund managers may be overly optimistic; if they are too high, then they may be excessively pessimistic.

Using data from 1954 through 2003, the regression formula for the relationship between interest rates and mutual fund cash reserves is:

\[ y = 0.4978x + 4.5464 \]

where

- \( y \) = expected cash reserve
- \( x \) = current rate on 90-day T-Bills

We can round off these figures and still retain the usefulness of the formula. Put into different terms, the regression formula tells us that cash reserves during any given month should be approximately 4.5% plus 50% of the current yield on 90-day T-Bills. Theoretically, if 90-day TBills were yielding 0%, then mutual funds would be expected to carry 4.5% of their assets in liquid investments. This is a “baseline” amount of cash, presumably needed to cover expenses, redemptions and the like.
Figure 2 uses the regression formula to show what percentage of cash we would expect mutual funds to hold given a range of values in T-Bill Yields.

### Figure 2

**T-Bill Yields and Expected Cash Reserves**

<table>
<thead>
<tr>
<th>T-Bill Yield</th>
<th>Expected Cash Reserve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>2.0%</td>
<td>5.5%</td>
</tr>
<tr>
<td>3.0%</td>
<td>6.0%</td>
</tr>
<tr>
<td>4.0%</td>
<td>6.5%</td>
</tr>
<tr>
<td>5.0%</td>
<td>7.0%</td>
</tr>
<tr>
<td>6.0%</td>
<td>7.5%</td>
</tr>
<tr>
<td>8.0%</td>
<td>8.5%</td>
</tr>
<tr>
<td>10.0%</td>
<td>9.5%</td>
</tr>
</tbody>
</table>

We know that in June 2004, cash reserves were at 4.3% of total assets. On June 30th, the yield on 90-Day T-bills was 1.31%. By plugging that value into the regression formula, we estimate that mutual funds should have carried 5.20% of their assets in cash. By taking the difference between what was expected and what was fact, we can conclude that mutual funds were carrying a “cash deficit” of 0.90%:

<table>
<thead>
<tr>
<th>Actual</th>
<th>Expected</th>
<th>Surplus/(Deficit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.30%</td>
<td>5.20%</td>
<td>(-0.90%)</td>
</tr>
</tbody>
</table>

By going back and comparing actual levels of cash to those that were expected given the prevailing level of interest rates, we can get a better handle on the sentiment of portfolio managers without the distorting effects of interest rates on cash reserves. The difference between actual and expected reserves will show that fund managers are giving a “premium” or “discount” to cash, and should create an effective contrary sentiment indicator. For purposes of brevity, we will call the difference between actual and expected reserves RAPAD (Rate Adjusted Premium And Discount).

### Adjusted Reserves as Sentiment Indicator

During the 49 years of the study, the mean value of the RAPAD measure was 0.0%, with a standard deviation of 1.5%. The distribution of readings from this measure hugs closely to a normal bell curve, so standard statistical measures should apply. If we look at how the market, defined as the S&P 500 cash index, performed after abnormal readings, we can begin to get an idea of how effective this measure may be at highlighting high- or low risk times in the stock market. For these purposes, we are defining “abnormal” as any reading more than 1.5 standard deviations away from the mean, which in this case would equate to all RAPAD readings less than -2.25% and greater than 2.25%. Put another way, we will see how the market performed after any month when mutual funds held 2.25% more or less cash than they should have held given the prevailing level of interest rates.

### Figure 3

**S&P 500 Performance After RAPAD Reading of -2.25% or Below (Extreme Cash Discount)**

<table>
<thead>
<tr>
<th></th>
<th>6 Months Later</th>
<th>12 Months Later</th>
<th>18 Months Later</th>
<th>24 Months Later</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Return</td>
<td>-3.0%</td>
<td>-6.1%</td>
<td>-5.5%</td>
<td>-1.8%</td>
</tr>
<tr>
<td>Percent Positive</td>
<td>31%</td>
<td>22%</td>
<td>36%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Figure 3 shows how the S&P 500 performed for up to 2 years after mutual funds were holding cash reserves that were at least 2.25% less than they should have been given the level of short-term interest rates at the time. The primary reason for giving cash such a discount was likely that the fund managers felt very optimistic about the future gains they were likely to make in the stock market, so they felt the need to be as fully invested as possible. As we can see from the table, this optimism was generally unwarranted. If we look at the results after 12 months, the S&P 500 showed an average return of -6.1%.

Looking at the months where cash levels were in a “normal” range (meaning RAPAD readings within 1.5 standard deviations of the mean), the average 12 month return in the S&P 500 was 8.7% during the study period. One-year returns after extreme cash discounts therefore underperformed an average return by 14.8%. We also see from Figure 3 that the S&P 500 was higher 12 months later only 22% of the time. There were 36 months that were considered to show an extreme cash discount, and only 8 times out of those 36 instances was the S&P 500 higher one year later.

Figure 4 gives us the performance after periods of extreme cash premiums, meaning those times when fund managers held at least 2.25% more cash than expected. The results here are markedly different from Figure 3. After 12 months, the S&P 500 was an average of 14.1% higher, outperforming an average month by 5.4%. Out of the 53 months that qualified as exhibiting an extreme cash premium, 47 lead to a higher market one year later, for a “success rate” of 89%. See Appendix A for a detailed list of all extreme RAPAD readings during the study period.

Figure 5 below shows the correlation between RAPAD readings and S&P 500 returns 12 months later.

### Figure 5

**S&P 500 12-Month Returns and RAPAD Readings**

The correlation between RAPAD readings and returns in the S&P 500 one year later is 0.32, suggesting that if we knew nothing else but what the current RAPAD reading was, we could improve our prediction of where the S&P 500 would close one year later by about 11%.

### Why Adjust for Interest Rates?

A valid question is why do we have to adjust for interest rates at all - aren’t cash levels by themselves a good enough indicator of excessive optimism or pessimism by fund managers? Monitoring cash levels on their own can indeed be an adequate contrary guide. However, there have been times where adjusting for interest rates has given a much better indication of excess. Figure 6 highlights just such an instance.
Figure 6 shows a plot of the S&P 500 (top scale), the raw values of mutual fund cash reserves (middle scale) and the RAPAD measure of cash premiums and discounts (lower scale).

On the chart, Point A corresponds to July 1976. At the time, 90-Day T-Bills were yielding about 5.2%. According to the regression formula, mutual funds should have been holding about 7.1% of their assets in cash. However, they were holding only 4.7% cash, so they were holding about 2.4% less cash reserves than they should have been given the level of short-term rates at the time. This was a show of extreme optimism on the part of fund managers, and the S&P refused to accommodate by declining into the beginning of 1978.

By early 1980, managers had built up their cash reserves once more, just in time for a stiff market rally over the next year. In January 1981 (Point B on the chart), 90-Day T-Bill rates had climbed all the way up to 14.6%, giving fund managers a very enticing incentive to hold large amounts of cash. They did have significantly more cash then than they did in 1976. At Point A, cash levels were around 4.7%, as stated above. At Point B, cash levels stood at 8.3%. Taken on its own, one could have easily concluded that fund managers were nowhere near as optimistic at Point B than they were at Point A. However, when we factor in prevailing interest rates, theoretically fund managers should have been holding 11.8% of their assets in cash at the time. Since they only had 8.3% in cash reserves, they were once again deficient by an extreme amount (3.5%). This told us that fund managers were indeed too optimistic, contrary investors should have expected a market decline (or at least difficulty making much headway), and the S&P ultimately declined sharply over the next one and a half years.

Out-of-Sample Testing and Other Technical Analysis Applications

In order to get an idea of how this method would have worked in real-time (without the perfect knowledge of hindsight), out-of-sample testing is necessary. This is where we take only a portion of the data as the look-back period for the regression formula, and then test to see how it would have predicted future moves in the S&P 500.

Using the period from 1954 through 1976 as the lookback period, the regression line between mutual fund cash levels and the 90-day T-Bill rate remained quite consistent with what was presented above:

\[ y = 0.5336 + 4.0163 \times \]

where

- \( y \) = expected cash reserve
- \( x \) = current rate on 90-day T-Bills

When we take this formula and determine the cash deficit or cash surplus from 1977 through 2003 (the out-of-sample period), we can determine how well it would have predicted future stock market returns. In Figure 5, we showed the correlation between RAPAD readings and one-year S&P 500 returns as being 0.32. Using this out-of-sample test, the correlation from 1976 through 2003 dropped to 0.21. However, given that correlation and the number of data points in the sample, once again the chances are virtually zero that this relationship occurred by chance alone.

In Figures 3 and 4, we showed how the S&P 500 performed after the cash premium or discount reached extreme levels. Taking the same approach with the out-of-sample test, the results were very consistent. Here, “extreme” is considered to be any cash discount of -1.75% or less or any cash premium of +1.75% or more. One year after extreme cash discounts, the S&P 500 was higher 25% of the time, with an average return of -5.6%. One year after extreme cash premiums, the S&P 500 was higher 89% of the time, with an average return of 12.1%.

These results compare very favorably to those obtained previously, suggesting that the predictive power of this approach held up even during the out-of-sample testing. As with most contrary indicators, the RAPAD measure became most effective when it was giving extreme readings one way or the other.

It may be possible to achieve similar or even superior market-timing results by applying basic technical analysis to the cash levels themselves, without the need to adjust for interest rates. To test this, we used a simple moving average crossover system applied to the cash balances. We went long the S&P 500 cash index when a 12-month average of cash balances fell below their 60-month average and then sold when the 12-month average crossed back above the 60-month average.

Such a system did have some merit, as it would have kept an investor out of the bad markets of 1974 and 1987. It also would have kept one long during the roaring bull market of the 1990s. However, as with most crossover systems, whipsaws were an issue. Out of the 7 signals, 3 of them were losers, losing an average of 9%. The four winners, however, gained an average of 76% (due mainly to the 222% gain from the 1990’s).

If we used a very simple RAPAD method of going long when RAPAD first crossed above +2.25 and selling when it first crossed below -2.25 (so we would be buying when mutual fund cash reserves first became extremely high, and we would hold until they became extremely low), there would have been only four trades by this strict methodology. All four were winners, for an average gain of 155% (skewed by a 450% gain from the system going long in October 1985 and holding through March 1998). Since the data is released to the public with a one-month delay, we used the S&P closing prices as of the date one would have received the data, which reduced the returns somewhat but kept the trades much more based in reality. See Appendix B for a chart of each of the trade signals.

Other Factors

In the beginning paragraph, we highlighted several other factors, besides competing assets, which may affect mutual fund cash reserves. We have looked at what relation some of those have on cash reserves, and there does seem to be a correlation. However, since many of these developments are so new, we do not have enough data to draw reliable conclusions. Still, it is instructive to discuss the impacts of these variables on cash reserves so that we can more readily observe their impact going forward.

The listed options market has grown steadily over the past 10 years. In 1993, the Chicago Board Options Exchange was clearing approximately 9,000,000 options contracts on a monthly basis. By the end of 2003, that volume had tripled. The correlation between monthly options volume on the CBOE
and mutual fund cash levels from 1993 - 2003 was -0.66. This tells us that there was a large negative correlation between option volume and cash levels - as option volume increased, cash levels decreased. This could be a significant factor, however we are limited by a lack of reliable option volume data. Also, interest rates during this time were steadily decreasing. As we saw above, interest rates have had a definite impact on cash levels over nearly 50 years of data, so it is difficult to determine if cash levels were impacted more by option activity or by interest rates.

We also checked the correlation between cash reserves and futures market activity. For the latter, we used commercial trader positions (both long and short) in the large S&P 500 futures contract from 1986 - 2003. According to the Commodity Futures Trading Commission (CFTC), a commercial trader is a large trader (the definition of “large” has changed over the years) engaged in the futures market for the specific purpose of hedging the trader’s daily business activity. Comparing month-end positions in the Commitments of Traders report, there was a correlation of -0.80 between the futures positions and mutual fund activity. For the latter, we used commercial trader positions (both long and short) for the redemptions in the first place. As of June 2004, mutual funds held 4.3% of their total assets in liquid assets. Given the low level of short-term interest rates at the time, it is not entirely unexpected that cash reserves would be so low. Still, anytime the absolute level of cash is low, we believe investors should be warned. While fund companies have better reporting systems now than they did 20 years ago, there is still the possibility of a “cash crunch,” whereby unexpected redemptions cause heavy selling by mutual funds to meet the redemptions since they do not have adequate cash on hand to cover them.

As we saw from Figure 3, overly optimistic portfolio managers are a good sign that whatever rally is in place may be about to lose steam.

Recent Activity

As of June 2004, mutual funds held 4.3% of their total assets in liquid assets. Given the low level of short-term interest rates at the time, it is not entirely unexpected that cash reserves would be so low. Still, anytime the absolute level of cash is low, we believe investors should be worried. While fund companies have better reporting systems now than they did 20 years ago, there is still the possibility of a “cash crunch,” whereby unexpected redemptions cause heavy selling by mutual funds to meet the redemptions since they do not have adequate cash on hand to cover them.

This of course would exacerbate the market decline that is likely the reason for the redemptions in the first place.

Sources

Investment Company Institute (http://www.icinet.net)
The Federal Reserve Bank of St. Louis (http://www.stlouisfed.org)

Appendix A

The table below outlines each month where the RAPAD reading was considered extreme. The table gives the month of the occurrence, the S&P 500 cash index level at the time, the RAPAD reading for that month, and the return in the S&P 500 cash index 6, 12, 18 and 24 months later.

<table>
<thead>
<tr>
<th>Date</th>
<th>S&amp;P 500</th>
<th>RAPAD</th>
<th>6 Mo.</th>
<th>12 Mo.</th>
<th>18 Mo.</th>
<th>24 Mo.</th>
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<tr>
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</tr>
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<td>3.4%</td>
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Average Return  -3.0%  -6.1%  -5.5%  -1.8%  
Number of Occurrences 36 36 36 36  
Number of Positive Occurrences 11 8 13 18  
Positive Occurrences as % of Total 31% 22% 36% 50%  
Maximum Return 11.1% 21.1% 29.6% 36.0%  
Minimum Return -19.2% -27.5% -31.6% -43.2%  

All Occurrences with RAPAD Readings of +2.25 and Above (Extreme Cash Surplus)  
10/29/93  467.83  2.25  -3.6%  1.0%  10.0%  24.3%  
11/29/74  69.97  2.26  30.3%  30.4%  43.2%  45.9%  
11/28/86  249.22  2.27  16.4%  -7.6%  5.2%  9.8%  
1/31/94  481.61  2.28  -4.8%  -2.3%  16.7%  32.1%  
5/30/80  111.24  2.29  26.3%  19.2%  13.6%  0.6%  
6/30/88  273.50  2.29  1.5%  16.3%  29.2%  30.9%  
6/30/58  45.24  2.31  22.0%  29.2%  32.4%  25.8%  
4/30/86  235.52  2.32  3.6%  22.4%  6.9%  11.0%  
6/30/93  450.53  2.35  3.5%  -1.4%  1.9%  20.9%  
7/31/86  236.12  2.37  16.1%  35.0%  8.9%  15.2%  
6/29/90  358.02  2.40  -7.8%  3.7%  16.5%  23.3%  
7/30/93  448.13  2.55  7.5%  2.3%  5.0%  25.4%  
2/29/88  267.82  2.56  -2.4%  7.9%  31.2%  23.9%  
10/31/85  189.82  2.57  24.1%  28.5%  51.9%  32.6%  
2/28/94  467.14  2.58  18.2%  31.2%  23.3%  14.3%  
8/29/86  261.52  2.61  4.4%  22.3%  32.0%  37.8%  
11/30/89  345.99  2.78  4.4%  -6.9%  12.7%  8.4%  
5/31/88  262.16  2.75  4.4%  22.3%  32.0%  37.8%  
9/30/88  272.02  2.79  9.4%  27.2%  21.0%  30.9%  
3/31/88  258.89  2.91  5.0%  13.9%  34.9%  31.3%  
9/30/86  231.32  2.97  26.1%  39.1%  11.9%  17.5%  
8/29/86  252.93  3.00  -12.7%  -9.4%  -3.3%  7.4%  
4/30/87  288.36  3.00  -12.7%  -9.4%  -3.3%  7.4%  
3/31/88  258.69  3.10  8.2%  4.5%  17.8%  24.2%  
10/30/87  251.79  3.19  -2.8%  10.6%  19.1%  24.3%  
12/31/90  330.22  3.22  22.5%  26.3%  23.6%  31.9%  
9/30/74  63.54  3.25  13.8%  22.6%  27.9%  28.4%  
11/30/87  230.30  3.28  6.8%  18.5%  39.2%  50.2%  
4/30/90  330.80  3.36  -8.1%  13.5%  18.6%  25.4%  
11/30/90  322.22  3.46  21.0%  16.4%  28.9%  33.9%  

Average Return  8.3%  14.1%  19.4%  23.0%  
Number of Occurrences 53 53 53 53  
Number of Positive Occurrences 43 47 52 53  
Positive Occurrences as % of Total 81% 89% 98% 100%  
Maximum Return 31.2% 39.1% 61.7% 65.6%  
Minimum Return -12.7% -9.4% -3.3% 0.6%  

The figures below give the average of all data during the study period  
Average Return  4.1%  8.1%  12.2%  16.6%  
Number of Occurrences 585 579 573 567  
Number of Positive Occurrences 386 403 419 448  
Positive Occurrences as % of Total 66% 70% 73% 79%  

Appendix B

Trade signals using the extremes in the RAPAD mutual fund cash level as entries and exits.

Biography

Jason Goepfert is the President and CEO of Sundial Capital Research, Inc., a firm focused on the research and practical application of mass psychology to the financial markets. Prior to founding Sundial, Jason managed the operations of a large discount brokerage firm and a multi-billion dollar hedge fund, experience which firmly planted the idea that logic rarely trumped emotion when it came to traders’ investment decisions. Sundial trades proprietary capital and releases its research to institutional clients and individual investors via its web site, www.sentimenTrader.com