Research Report:
Developing the "Next Generation" Active Risk Management System For the U.S. Stock Market

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The Next Generation Active Risk Manager System

The character of the stock market is constantly changing and evolving. Decimalization, the advent of ETFs, online trading, HFT, and the proliferation of algo-driven trading are examples of developments that have impacted the character of the stock market over the last decade. As a result, we believe that management strategies must also continue to evolve in order to adapt to the ever-changing market landscape.

Specifically, we believe that the dominance of algo-driven computerized trading, which occurs at the speed of light and according to reports now accounts for upwards of 70% of the daily volume on the NYSE, has caused the size of the daily moves in the stock market to expand. In short, the intraday moves seen in the stock market are now more exaggerated than ever before.

In response to the changing environment, we set out to upgrade our systems for managing risk in the U.S. stock market – I.E. to develop the next generation of our Active Risk Manager Systems. The primary goal was to update our approach and strategy so that the programs would be able to adapt to today's faster-pace of life in the stock market. What follows are the results of our research efforts.

Upgrading the System

Our goals for the new, upgraded "next gen" Active Risk Manager system were to diversify both the managers and the strategies employed, reduce volatility, limit exposure to whipsaws, incorporate "index selection" into the process, and attempt to create a "smoother ride" for those involved with the program.

In short, we wanted the next generation of the Active Risk Manager System to be more client-friendly and easier to "live with" than its predecessor.

To accomplish these goals, we developed the new programs to (a) incorporate additional managers and additional management strategies and (b) make incremental market moves in and out of the market. The overall intent was to diversify the program in terms of strategy, methodology, and managers.

Incremental Changes in Exposure

A key change intended for the "next gen" programs was to develop an approach that would make incremental changes in exposure. Instead of moving in and out of the market with 100% positions (which can be hard on the nerves at times), we wanted positions to be put on or taken off in stages.

The plan is to incorporate additional strategies into the "next gen" programs and then allocate a predetermined amount of the overall portfolio to each strategy employed. Thus, incremental exposure changes would be triggered by each individual strategy's signals.

The incremental exposure changes are targeted to be in the range of 20% to 50% each. The overall goal of this modification is to reduce the number of whipsaw trades and to keep positions more in line with the overall market environment.

New Strategies

In terms of new strategies being incorporated into the "next gen" programs, perhaps the biggest upgrade is the inclusion of "swing trading" and "mean reversion" strategies. Simply put, these strategies focus on opportunities when market moves become stretched too far in either direction.

The swing trading and mean reversion strategies are being included due to our belief that intraday moves are now more exaggerated than in the past. Therefore, trend-following systems or traders focused on key technical levels in the market are forced to buy and sell into what are oftentimes artificial moves. We believe this is having a negative impact on our short-term trend-following system as the results from whipsaw trades (which have always part of the game and can never be eliminated) are now more negative than they were in the past.

Below is a brief explanation of the new strategies being incorporated into the "Next Gen" Active Risk Manager programs:

The Active Swing System

The Active Swing system is designed to trade contrary to the most recent directional move in price to capitalize on an identified short-term statistical tendency to revert to prior price levels – commonly referred to as "mean reversion."

The swing trading system utilizes a "model of models" approach focusing on price oscillations of the S&P 500, price movement relative to volatility across multiple time frames, and a risk and volatility budget scheme, which attempts to limit drawdowns in adverse conditions.

During periods of low volatility, the strategy has an imputed bias to the long side and conversely, a bias toward cash during periods of high volatility.

The Active Swing strategy utilizes an incremental long or short approach using ETFs or index funds.

Incorporating a "risk budgeting" technique makes the Active Swing strategy unique and helps guard against negative market environments. For example, should strategy performance or volatility exceed preset limits, positions are reduced via increased cash levels.

The “next gen” Active Risk Manager programs will also incorporate a leveraged version, the Aggressive Swing system. As the name implies, this system has a much more aggressive risk profile. The approach utilizes a higher exposure in all circumstances and incorporates the use of leveraged positions that are capped at 1.5X the S&P 500.

The Active Swing systems have been live since 1/1/2012 and tested back to 2006. While there are inherent flaws with all backtests, being able to test the model over an extremely long period of time allows us to see how the model dealt with various market events and ever changing market environments.

Below are the backtest results for the systems:

Year	Active Swing	Aggressive Swing	S&P 500
2006	15.39%	28.69%	13.62%
2007	10.50%	15.06%	3.53%
2008	45.11%	45.97%	-38.49%
2009	26.38%	18.74%	23.45%
2010	15.82%	15.62%	12.78%
2011	14.14%	16.07%	0.00%
2012	15.82%	18.74%	13.41%
2013	13.08%	39.17%	29.60%
Cumulative	295.87%	469.10%	48.08%
Last 5 Years	118.83%	163.31%	104.64%
Last 3 Years	49.50%	91.80%	46.97%
Last 2 Years	30.98%	65.25%	46.98%

Past performance is no guarantee of future results. Please see important disclosures about the limitations of backtesting at the end of this report. The S&P 500 Index used is price only and does not include the reinvestment of dividends.

The Mean Reversion Model

The Mean Reversion model is a “model of models” designed to produce buy and sell signals when the market is not in a strong trending mode. The model consists of five separate indicators or models that produce buy signals and five indicators/models designed to produce sell/short signals.

One of the most important aspects of the Mean Reversion model is that all of the indicators employed utilize stop losses. In addition, each of the indicators uses a time-based exit strategy. This means that there is a time limit placed on each position.

The mean reversion model was created in 2011 and has been backtested to 1982. Below are the backtest results for the Mean Reversion Model as well as a version utilizing maximum leverage of 1.5X:

Year	Mean Reversion Model	Mean Reversion Model 1.5X	S&P 500
1982	-3.41%	-5.47%	14.76%
1983	28.68%	45.55%	17.27%
1984	31.59%	50.40%	1.40%
1985	-2.42%	-3.76%	26.33%
1986	13.38%	20.47%	14.62%
1987	61.06%	98.99%	2.03%
1988	10.31%	15.47%	12.40%
1989	7.97%	12.04%	27.25%
1990	-1.77%	-3.11%	-6.56%
1991	14.41%	21.92%	26.31%
1992	11.87%	18.15%	4.46%
1993	6.32%	9.58%	7.06%
1994	10.01%	15.22%	-1.54%
1995	6.18%	9.36%	34.11%
1996	24.23%	38.19%	20.26%
1997	5.06%	7.26%	31.01%
1998	30.25%	47.68%	26.67%
1999	28.02%	44.43%	19.53%
2000	17.22%	26.17%	-10.14%
2001	4.36%	6.02%	-13.04%
2002	5.39%	7.21%	-23.37%
2003	17.72%	27.41%	26.38%
2004	14.18%	21.81%	8.99%

2005	13.10%	20.08%	3.00%
2006	2.30%	3.32%	13.62%
2007	8.64%	12.75%	3.53%
2008	43.48%	67.45%	-38.49%
2009	3.17%	4.41%	23.45%
2010	17.28%	26.41%	12.78%
2011	41.95%	67.80%	0.00%
2012	9.04%	13.67%	13.41%
2013	21.87%	34.34%	29.60%

Last 10 Years	370.02%	865.01%	66.23%
Last 5 Years	128.25%	238.20%	104.63%
Last 3 Years	88.63%	156.24%	46.97%
Last 2 Years	32.88%	52.70%	46.98%
Last Full Year	21.87%	34.34%	29.60%

Past performance is no guarantee of future results. Please see important disclosures about the limitations of backtesting at the end of this report. The S&P 500 Index used is price only and does not include the reinvestment of dividends.

Incorporating Index Selection into the Active Risk Manager System

The positions utilized in the current Active Risk Manager Program are limited to ETFs, funds, and/or VA subaccounts that mirror the S&P 500 index. The “next gen” programs will also incorporate a leadership-based, relative strength selection approach for a portion of the program holdings.

The idea is to utilize the strongest index (determined by relative strength over multiple time frames) at the time a buy or sell signal from the system is given. This will provide the Active Risk Manager program with the opportunity to add additional “alpha” via the incorporation of the top performing equity indices.

The universe of indices used includes:

- S&P 500
- Dow Jones Industrial Average
- NASDAQ 100
- S&P 400 Midcap
- Russell 2000 Smallcap

Perhaps the best example of the benefits of such a strategy would have occurred in 1999. Recall that before the technology bubble burst, internet stocks were skyrocketing. As a result, an allocation to the NASDAQ 100 would have provided a great deal of outperformance as compared to the S&P 500.

Backtesting the "Next Generation" Concept

Before we ever consider going live with an investment strategy, we insist that the management system be thoroughly backtested – preferably in good markets, bad markets and everything in between. In essence, we are looking for an indication of how the system might perform in different environments and varying conditions.

We should make it clear that all backtests are inherently flawed and should not be used to determine how a system might perform going forward. Rather, a backtest merely gives us a general indication of what we might be able to reasonably expect in different environments.

At the heart of the Active Risk Manager System is our unemotional, disciplined Market Environment Model**.** The model incorporates literally hundreds of component models and indicators designed to tell us when risk factors for the markets are high, low, or uncertain.

To review, when our Environment model is positive, it indicates that the odds favor the bulls and that we should utilize more aggressive, long strategies. When the Environment is neutral, it indicates that the environment is uncertain. In a neutral environment, history shows that it is usually best to reduce risk and use a less aggressive approach. And when the Environment model is negative, it is an indication that risk of a decline is high and that a defensive strategy is appropriate.

Below is a summary of the allocations used in our hypothetical backtest of the "next gen" programs broken out by the reading of our Market Environment Model.

When the **Market Environment Model was Positive**, the program allocations were:

Aggressive Model:

75% 3X Long S&P 500 Index

25% 2X Mean Reversion

Hybrid Model:

75% 2X Long S&P 500 Index

25% 2X Mean Reversion

Main Model:

50% Long S&P 500 Index

25% Mean Reversion

When the **Market Environment Model was Neutral**, the program allocations were:

Aggressive Model:

100% 2X Mean Reversion

Hybrid Model:

75% 1.5X Mean Reversion

25% Cash

Main Model:

75% Mean Reversion

25% Cash

When the **Market Environment Model was Negative**, the program allocations were:

Aggressive Model:

40% 2X Inverse S&P 500

35% 2X Mean Reversion

25% Cash

Hybrid Model:

40% 1X Inverse S&P 500 Index

35% Mean Reversion

25% Cash

Main Model:

40% 1X Inverse S&P 500 Index

35% Mean Reversion

25% Cash

Analyzing Backtested Results

Although the strategies utilized in the backtest are not exactly the same as those that will be used in the "next gen" programs, we look to the backtested data to provide **"proof of concept."**

We use the backtested returns to see how the system might have performed in positive markets, negative markets and the always challenging neutral market environments.

For example, periods such as 1984, 1990-91, 1994, 1998, 1999, 2000-02, 2008, and 2011 are key as each represented specific and varied challenges to the market. Our hope was that the system would perform well in these difficult markets and also display a tendency to adapt to changes in the character of the market over time.

We also wanted to identify periods where the system did NOT perform well. To be sure, there is no such thing as a perfect system and ALL systems underperform – sometimes badly – for periods of time. Thus, we want to know how long periods of underperformance have lasted.

With that said, below are the results of our "proof of concept" backtest of the Next Gen system.

Again, please note that there are inherent flaws in all backtesting. The strategy performance referred to below is hypothetical and is derived from the retroactive application of a strategy over a select market period and developed with the benefit of hindsight. Please review the important disclosures relating to backtesting at the conclusion of this report.

Year	Next Gen Aggressive	Next Gen Hybrid	Next Gen Main	S&P 500
1982	45.91%	27.92%	18.90%	14.76%
1983	65.78%	44.69%	23.54%	17.27%
1984	31.70%	21.22%	19.00%	1.40%
1985	64.78%	39.78%	18.60%	26.33%
1986	49.90%	33.95%	18.97%	14.62%
1987	107.93%	70.53%	48.45%	2.03%
1988	9.44%	8.04%	6.54%	12.40%
1989	67.86%	44.28%	21.27%	27.25%
1990	-2.73%	-1.71%	-2.19%	-6.56%
1991	30.51%	23.75%	10.53%	26.31%
1992	8.24%	5.79%	8.54%	4.46%
1993	13.09%	9.53%	6.10%	7.06%
1994	8.50%	5.68%	6.12%	-1.54%
1995	54.09%	35.15%	16.35%	34.11%
1996	48.41%	35.09%	16.62%	20.26%
1997	72.00%	46.55%	21.21%	31.01%
1998	157.34%	89.18%	59.01%	26.67%
1999	28.16%	18.83%	18.08%	19.53%
2000	35.91%	20.78%	21.36%	-10.14%
2001	12.19%	7.96%	7.96%	-13.04%
2002	9.93%	6.29%	6.19%	-23.37%
2003	70.80%	45.56%	27.17%	26.38%
2004	16.79%	11.40%	11.87%	8.99%
2005	3.29%	4.03%	2.56%	3.00%
2006	1.65%	1.58%	0.93%	13.62%
2007	11.86%	8.11%	6.04%	3.53%

2008	96.45%	48.76%	48.76%	-38.49%
2009	69.85%	47.36%	19.68%	23.45%
2010	16.33%	12.16%	10.25%	12.78%
2011	18.00%	13.57%	19.53%	0.00%
2012	26.30%	18.20%	11.07%	13.41%
2013	62.68%	39.38%	29.16%	29.60%
Last 10 Years	1190.70%	485.49%	313.30%	66.23%
Last 5 Years	379.02%	209.24%	126.26%	104.63%
Last 3 Years	142.44%	87.10%	71.48%	46.97%
Last 2 Years	105.47%	64.74%	43.46%	46.98%

We note that the backtested programs did NOT perform well in 1988, 1990, 1992, 1993-94, and the 2005-2006 period. **As such, it is important to recognize that there have been two-year periods of underperformance.**

Past performance is not a guarantee of future results. Please see important disclosures about the limitations of backtesting at the end of this report. The S&P 500 Index used is price only and does not include the reinvestment of dividends.

Backtesting The Full Next Generation Systems

Although all of the strategies intended to be utilized in the "next gen" programs do not have historical tests back to 1982, we wanted to test the targeted allocations – again, for "proof of concept."

Below is the methodology used for hypothetical backtest incorporating the strategies as intended for the "next gen" programs.

When the **Market Environment Model was Positive**, the program allocations were:

Aggressive Model:

25% 3X S&P 500 Index

25% 3X Russell 2000 Smallcap Index

50% 3X Mean Reversion

Hybrid Model:

25% 2X S&P 500 Index

25% 2X Russell 2000 Smallcap Index

50% 2X Mean Reversion

Main Model:

25% 1.5X S&P 500 Index

25% 1.5X Russell 2000 Smallcap Index

50% 1.5X Mean Reversion

When the **Market Environment Model was Neutral**, the program allocations were:

Aggressive Model:

50% 2X Mean Reversion

50% Aggressive Swing

Hybrid Model:

38% 2X Mean Reversion

37% Aggressive Swing

25% Cash

Main Model:

38% 1.5X Mean Reversion

37% Active Swing

25% Cash

When the **Market Environment Model was Negative**, the program allocations were:

Aggressive Model:

25% 2X Inverse S&P 500

25% Aggressive Swing

25% 2X Mean Reversion

25% Cash

Hybrid Model:

25% 1.5X Inverse S&P 500

25% Aggressive Swing

25% 1.5X Mean Reversion

25% Cash

Main Model:

25% 1X Inverse S&P 500

25% Active Swing

25% 1.5X Mean Reversion

25% Cash

Backtested Results of the "Next Generation" Programs

Below is a summary of the hypothetical backtest using the systems selected for the "next gen" Active Risk Manager system:

Year	Next Gen Active Risk Manager System: Aggressive	Next Gen Active Risk Manager System: Hybrid	Next Gen Active Risk Manager System: Main	S&P 500
2006	11.78%	9.14%	5.20%	13.62%
2007	21.78%	15.23%	11.21%	3.53%
2008	83.60%	62.11%	49.26%	-38.49%
2009	53.80%	35.14%	28.52%	23.45%
2010	30.47%	21.62%	19.17%	12.78%
2011	20.08%	16.60%	14.49%	0.00%
2012	31.62%	21.39%	15.56%	13.41%
2013	54.07%	37.01%	22.83%	29.60%
Cumulative	1121.23%	549.78%	334.58%	48.08%
Last 5 Years	388.66%	218.73%	148.89%	104.64%
Last 3 Years	143.51%	93.93%	62.50%	46.97%
Last 2 Years	102.79%	66.31%	41.94%	46.98%

It is also important to note that the **strategies and allocations employed by the Next Gen programs may change at any time.**

Important Disclosures Relating to Backtesting:

The test results provided herein are HYPOTHETICAL. The tests of the trading systems displayed are for information purposes only and should not be used or construed as an indicator of future performance, an offer to sell, a solicitation of an offer to buy, or a recommendation for any security or program.

The return calculations presented are based on historical system testing. It should be noted that test results **do NOT represent actual trading, do NOT take into account either the payment of commissions or reinvestment of dividends, and have inherent limitations.** The strategy performance referred to herein is derived from the retroactive application of a model or models over a select market period and developed with the benefit of hindsight.

All returns illustrated in this research report are before commissions, management fees, and slippage. As such, returns illustrated cannot be expected to be achieved. There can be no guarantee that profits will be made, or even that losses will be avoided. Some of the risks these strategies can be exposed to include: strategy and timing decisions may not always be correct and may adversely affect account performance. The implementation of timing signals may not be done in a timely fashion. The use of leverage may magnify risk. Leverage and ETF's employing derivatives carry other risks that may result in losses, including the effects of unexpected market shifts, default and/or the potential illiquidity of certain securities.

The performance results depicted have been produced by application of selected trading signal criteria to historical stock index price data. It is assumed that when on a "buy" signal, the hypothetical test account owns the allocation specified in the test. When on a "sell" signal, it is assumed that the hypothetical test account owns the allocation specified in the test. When on a neutral signal, it is assumed that the hypothetical test account owns the allocation specified in the test.

Returns have been compounded on a trade by trade basis.

The hypothetical system test research report is NOT represented as actual trading or client experience, nor does it reflect the impact on decision making of economic or market factors experienced during actual management of funds. Performance between selected dates may be misleading as indicative of overall performance of a strategy, since they may have been selected to present optimum performance.

Actual results may differ from results reported for the model portfolio for many reasons, including, without limitation: (i) performance results for the model portfolio do not reflect trading commissions that you may or may not incur; (ii) performance results for the model portfolio do not account for the impact, if any, of certain market factors, such as lack of liquidity, that may affect your results; (iii) the securities chosen for the model portfolio may be volatile, and (iv) the prices of securities portfolio at the point in time you begin may be higher than such prices at the time such stocks or options were chosen for inclusion in the model portfolio.

Index returns are price only and do not include the reinvestment of dividends. The S&P 500 is a stock market index containing the stocks of 500 large-cap corporations, most of which are US companies. The index is the most notable of the many indices owned and maintained by Standard & Poor's, a division of McGraw-Hill. S&P 500 is used in reference not only to the index but also to the 500 companies that have their common stock included in the index.

Past performance is not a guarantee of future results.