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SHARING TECHNIQUES

DEVELOPING AN OEX OPTIONS STRATEGY WITH EDS

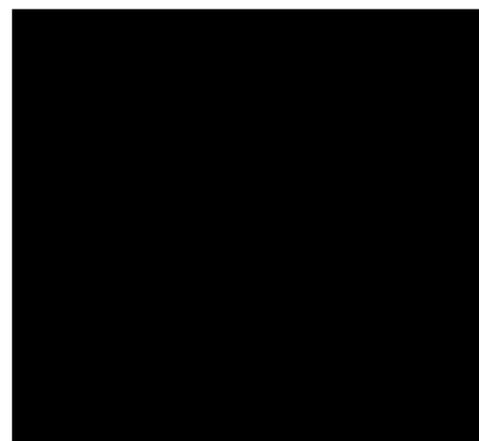
By Paul Luebbe

From the Editor:

Following up on our technique to time the OEX index, which we discussed in an article in the April Opening Bell, AIQ user Paul Luebbe performed some very impressive work using AIQ's new Expert Design Studio (EDS) to create an OEX trading system. Mr. Luebbe shares the trading strategy he developed in this article.

Mr. Luebbe, who has a master's degree in electrical engineering from the University of Pittsburgh, has spent most of his career in the high-tech industry, in hardware and software sales. An AIQ user since 1993, he pursues his objective of trading using a series of low-frequency, high-probability mechanical systems that provide a greater return with reduced risk. Mr. Luebbe spends about 30 minutes a week executing his mechanical systems. With the EDS module, he is now spending a great deal of time researching and developing new systems.

I have long been interested in trading OEX options. Perhaps it is the allure of the leveraged nature of options, or simply the interest in adding another dimension to my trading portfolio. Regardless, despite



Paul Luebbe

years of searching for an OEX trading algorithm with AIQ TradingExpert and dozens of spreadsheets attempting to model rules for trading, I had not met with much success ... until now with EDS.

Instead of using the OEX ticker in EDS, I created a "market ticker" for the OEX in the same manner as was discussed in April's *Opening Bell*. The value, of course, of using an OEX market ticker over the OEX ticker itself, is that the market ticker will add volume-based indicators to the existing price-based indicators. The market ticker will also provide the option of using Expert Rules.

Sharing Techniques continued on page 2

As I started my testing, I settled on a few objectives that would define a "successful" algorithm:

1. High probability of success is a very important aspect to options trading.
2. A short holding period was important to me (i.e., on the order of 10 days) in order to deal with the decay of the option time premium.
3. A favorable Average Profit/Loss (P/L) number was a goal. It should be noted that, because the SPX price pattern is closely related to the OEX price pattern, comparing the average P/L of an OEX trade to the SPX over the same period of time should not yield significant differences. The P/L number should be high enough to lead to a reasonable trade. With today's OEX, a 1.5%-2.0% average trade would yield 8-11 points on the OEX - quite acceptable for an OEX options trade.
4. I want the average profit of a winning trade to be greater than the average loss of a losing trade. (This is very important in high-leverage trading. Failure to achieve this is often the demise of an options or futures trader.)

In order to achieve these objec-

tives, I expect that there will be a low frequency of trades. With equity trades, I focus on a very strong Average Annual ROI and its comparison to a benchmark. However, for short duration/low-frequency options, the four objectives listed above are much more important.

Entry Conditions

My first attempt to find a trigger mechanism to enter a trade was to consider the Expert Ratings of the OEX market ticker. So, I defined an entry condition that an up ER of 95 or greater had to occur within the past 3 days. Also, from years of staring at short-term price and indicator patterns, I have learned that the general upward movement of the MACD Oscillator closely tracks the general upward movement of a security's price. Therefore, I defined my initial entry conditions for the BuyOEXST rule such that an up ER had to occur within 3 days and must be confirmed by a 1-day increase in the MACD Oscillator. The selection of 3 days on an up ER and the use of the MACD Oscillator instead of the Phase oscillator are significant because I am looking for a quick entry before the price of the OEX increases significantly.

In order to run the backtest, I used a range of 1/3/94 - 4/13/98. In order to run an EDS screening on just the OEX market ticker, I created a list that contained only that ticker. In EDS, the Properties was then set to the list name that contained the OEX market ticker. As for the sell criteria, I restricted my backtest to a 10-day evaluation period. This gave me a good idea of how many trades are available over the range, and also provided an idea of the probability of success for my entry conditions without considering the proper exit condition.

The results of this first attempt yielded a probability of 65.52% across 29 trades; average P/L of 0.83% vs. SPX P/L of 0.78%; and average ROI of 20.86% vs. SPX ROI

of 31.26%. The probability was not bad, but with these entry conditions, 29 trades would be the maximum possible, and the average P/L was fairly low.

My next test was to eliminate the test for a high up ER and to only use an upward movement of the MACD Oscillator. The results of this attempt yielded a winning trade probability of 66.67% across 81 trades; average P/L of 1.01% vs. SPX of 0.98%, and average ROI of 25.53%. This looks better.

Once I found a "trigger" entry condition, I then tried to find an additional condition(s) in the ticker that would suggest that the price would continue to move higher. An additional condition placed into the BuyOEXST will decrease the number of trades by weeding out bad trades, increase the probability, and hopefully increase the average P/L.

I have always been fascinated with divergences; a divergence is a condition where an indicator is showing an increase while the price has yet to "catch up". I have found these to be very useful in my previous visual inspection of price and indicator patterns. Now I can measure them empirically with EDS. The list of EDS Prebuilt Routines provides 6 routines for positive divergences (AcmDis, Moneyflow, OBV Pct, OBV, SVMA, and VA Pct).

After many tests and trials, I realized that divergences are relatively rare, but powerful. Additionally, with the list of trades from my last backtest, I observed that a strong correlation exists between a divergence from *any* of the six listed with a subsequent increase in price. However, I also observed a lower correlation between a price increase and a divergence from any *particular* indicator of the six. Finally, I observed that when more than one divergence is present, the probability of a price increase is even greater. The number of backtests required to reach these conclusions is too voluminous for this article, but I settled

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SHARING TECHNIQUES *continued* . . .

on a “preponderance of the evidence” methodology by counting the number of divergences and then optimizing that number for the BuyOEXST rule.

I found that the optimal point came by requiring that two of the six divergence rules need to be triggered. The results of this backtest (with the same Range and same 10-day evaluation) produced a probability of 79.17% across 24 trades; average P/L of 1.73% vs. SPX P/L of 1.51%; and average ROI of 43.61% vs. SPX ROI of 31.26% (see **Figure 1**). This is a remarkable improvement, and I am now ready to look for exit conditions.

Exit Conditions

For exit conditions, I had two basic possibilities; percentage capital and profit protection, or to exit upon a specified condition. Because I really don't know what sort of percentage to expect from a short-term OEX strategy, I decided to pursue the exit condition approach.

As stated earlier, I have visually noticed the correlation between the general upward movement of the MACD Oscillator and the general

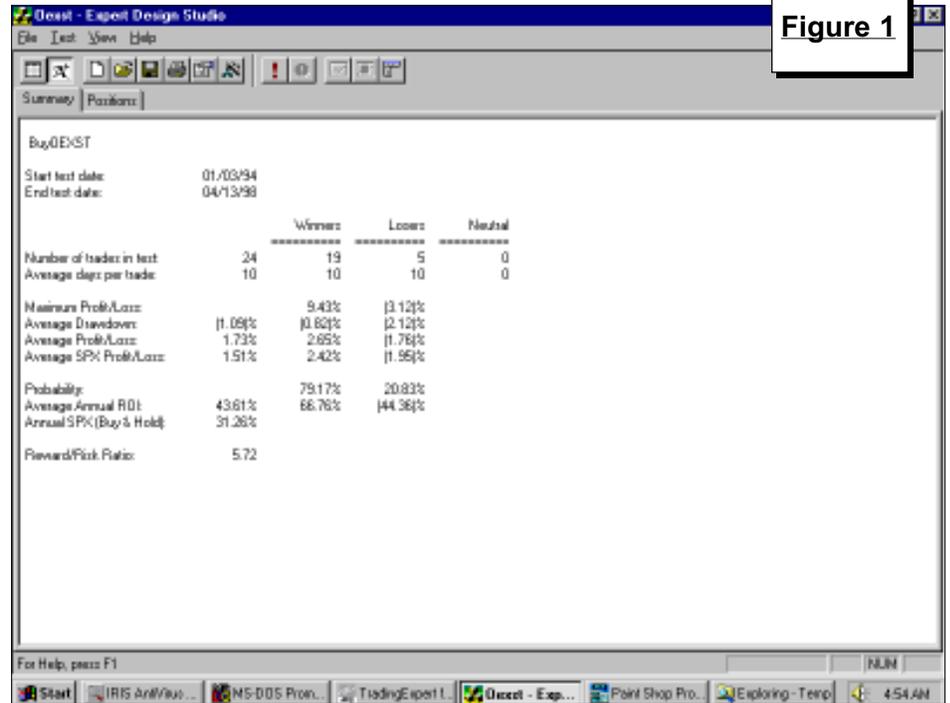


Figure 1

upward movement of a security's price. As such, my first exit rule was to exit when the MACD Osc decreases for 1 day. After defining the rule in the EDS document, I executed the backtest by modifying the Exit properties. I selected the "Trade it" button, deselected the first 2 boxes

for capital and profit protection, and selected the last box to exit on ExitRule after 1 period.

The test produced a probability of 56.25% across 32 trades each averaging 5 days in length; average P/L of 0.66% vs. SPX P/L of 0.59%; and average ROI of 30.50% vs. SPX ROI of 31.26%. This was obviously too tight of an exit condition. And upon evaluation of the 32 positions listed in the Positions tab, I could visually see that the MACD Osc had turned down for 1 day in the midst of many longer price increases. Therefore, I modified the ExitRule to require that the MACD Osc decrease for two consecutive days.

The results from adding this exit rule are shown in the **Figure 2**. This test produced a probability of 70.83% across 24 trades each averaging 9 days in length; average P/L of 1.78% vs. SPX P/L of 1.63%; and average ROI of 47.97% vs. SPX ROI of 31.26%. This looked much better.

Measuring these results against my four original objectives, I have a reasonably high probability of success at over 70%, my average

Sharing Techniques continued on page 4

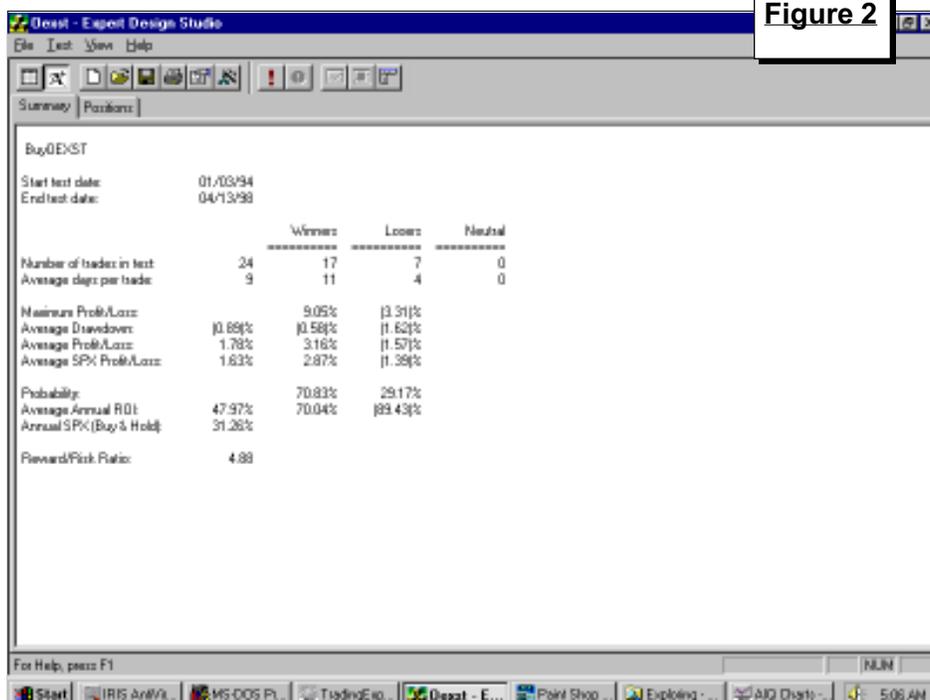


Figure 2

holding period is very close to 10 days, and a 1.78% profit for the average trade would mean almost 9 points on the OEX at today's levels. So far so good. Finally, examination of the EDS backtest Summary tab shows that my average winning trade gained 3.16% while my average losing trade lost only 1.57%. This is exactly the situation that I hoped to achieve with the fourth condition. This algorithm is tradable.

The final EDS model is found in **Figure 3**. The IFF() function counts the existence of a positive divergence; z3DivU is the constant identifying the number of divergences required for entry, and DivUP is the divergence rule that was added to the final BuyOEXST rule.

Further Work

The obvious next step in the development of this algorithm would be to evaluate the effect of market timing. Until EDS incorporates a market timing capability into the rules language, this is very difficult to automate (*Editors note: the next version will have this feature*). However, when I compare the 24 positions against my own market timing model, I can see that the number of trades will further decrease, the probability will increase, as will the average P/L and the average ROI. Further work can be done to better address the Expert Ratings generated by the OEX market ticker. Also, further tests should be performed on the positive divergence rule. New rules should also be considered which would include testing other indicators such as the Stochastic, RSI, etc. Finally, further testing may lead to a more

!ENTRY RULES

MACDOscup if [MACD Osc] > Val([MACD Osc], 1).

!check for divergences

define z3DivU 2.

ACMDISupPRICEdown if SLOPE([AcmDis],21)>0 and SLOPE([close],21)<0.

MFupPRICEdn if Slope([Mnyflow],60)>0 and Slope([close],60)<0.

OBVPctDIVup if Slope([OBV Pct],45)>0 and Slope([close],45)<0.

OBVupPRICEdn if Slope([OBV],21)>0 and Slope([close],21)<0.

SVMAdivUP if Slope([SVMA],15)>0 and Slope([close],15)<0.

VAPCTdivUP if Slope([Va Pct],45)>0 and Slope([close],45)<0.

c1 is IFF(ACMDISupPricedown, 1, 0).

c2 is IFF(MFupPRICEdn, 1, 0).

c3 is IFF(OBVPctDIVup, 1, 0).

c4 is IFF(OBVupPRICEdn, 1, 0).

c5 is IFF(SVMAdivUP, 1, 0).

c6 is IFF(VAPCTdivUP, 1, 0).

DivUP if (c1 + c2 + c3 + c4 + c5 +c6) >= z3DivU.

BuyOEXST if MACDOscup and DivUP.

!EXIT RULES

MDOdown if [MACD Osc] < Val([MACD Osc], 1) and (Val([MACD Osc], 1) < Val([MACD Osc], 2)).

ExitRule if MDOdown.

complex set of exit rules.

Conclusions

Establishing 23 option positions across 4 ¼ years will not be the center of my trading. However, having an algorithm that produces a high-probability, low-frequency, and short duration trading system can make a nice addition. Having *several* such algorithms can keep a trader fairly busy and increasingly wealthy. What is interesting to note, is that I never would have found this opportunity without EDS.

Mr. Luebbe's OEX timing model can be downloaded from the internet at www.aiq.com. Choose *Technical*

Support from the menu on the left, and then select *TradingExpert 4.1 and Expert Design Studio*. Mr. Luebbe can be reached at luebbe@erols.com. ■

Share Your EDS Models

We'd like to publish effective EDS screening techniques developed by AIQ users. E-mail your best EDS files to Opening Bell at AIQonline@aol.com and include your name and phone number. If yours is published, we'll extend your Opening Bell subscription one year.

Figure 3

EDS Model

MARKET TIMING

AIQ AND THE BEAR — HOW EFFECTIVE ARE OUR SELL SIGNALS?

With the AIQ market timing model in a bearish mode, attention has turned to the effectiveness of the timing model's sell signals. The typical feeling is that the market timing model works on the buy side but not on the sell side. In the last few years, this can be said of almost all timing systems. We've been in such a strong uptrending market environment that even the sideways movement after our April 17 sell signal feels like a correction!

As most readers know, the AIQ timing model is not optimized. The signals that you see scrolling back in time are the same as they were on the dates they were originally registered. The current knowledge base is about six years old, and there were only small changes over the previous model. Therefore, all backtests of the model are valid.

To determine the effectiveness of the market timing model's sell signals, we assembled a list of the time periods when the system was on a sell signal (**Table 1**). The first column lists the day the sell signal was registered using Expert Ratings of 95 or greater. The second column lists the dates when the next market timing buy signal was registered. The final column lists the change in the S&P 500 during that time period. This assumes that you could trade the S&P 500 the day of the signal.

Table 2 summarizes the effectiveness of both the buy and sell signals. During the average sell signal, the S&P 500 loses 1.25% with a 21 day holding period. The best signal was the October 1987 sell signal that caught the market crash (yes, we were in business and were on a sell at that time). If you exclude this one trade, the average signal

Market Timing continued on page 8

Table 1

Standard & Poor's 500 Performance During Sell Signals

Expert Rating Sell Date	Expert Rating Buy Date	S&P 500 % Change	Expert Rating Sell Date	Expert Rating Buy Date	S&P 500 % Change
02/12/85	03/19/85	-0.56	06/17/91	06/28/91	-2.36
04/03/85	05/09/85	1.57	07/24/91	08/21/91	3.16
09/03/85	09/13/85	-2.66	09/04/91	09/11/91	-1.25
04/29/86	05/20/86	-1.83	10/24/91	10/29/91	1.66
06/06/86	07/14/86	-3.08	11/15/91	11/29/91	-1.93
09/08/86	09/22/86	-5.32	02/04/94	02/28/94	-0.57
03/27/87	05/26/87	-2.37	03/24/94	03/28/94	-0.94
07/01/87	07/29/87	4.20	06/20/94	06/27/94	-1.79
08/27/87	09/22/87	-3.59	08/05/94	08/23/94	1.62
10/06/87	12/07/87	-28.34	09/19/94	09/26/94	-2.13
12/28/87	01/20/88	-1.20	09/29/94	10/10/94	-0.69
04/14/88	05/03/88	1.25	10/20/94	11/07/94	-0.81
05/05/88	05/13/88	-0.78	04/20/95	04/21/95	0.63
07/18/88	07/28/88	-1.66	06/16/95	08/25/95	3.75
10/27/88	11/09/88	-1.42	10/02/95	10/12/95	0.24
01/03/89	03/03/89	5.76	10/19/95	11/16/95	1.13
03/17/89	03/29/89	-0.12	12/18/95	01/16/96	0.27
06/29/89	06/30/89	-0.53	04/03/96	04/15/96	-2.04
10/11/89	11/15/89	-4.61	04/17/96	05/08/96	0.49
01/10/90	01/31/90	-5.25	06/07/96	07/09/96	-2.76
02/20/90	02/27/90	0.69	08/29/96	09/09/96	0.97
03/22/90	05/01/90	-1.02	01/06/97	01/07/97	0.75
07/05/90	08/13/90	-4.73	03/13/97	03/21/97	-0.69
10/09/90	10/15/90	-0.61	08/08/97	09/02/97	-0.64
12/21/90	01/16/91	-4.70	11/18/97	12/29/97	1.61
04/22/91	05/01/91	-0.17	01/08/98	01/12/98	-1.76

Table 2

Summary Statistics

Average Buy Signal

S&P 500 change per signal 4.38%
Average holding period 54 days

Average Sell Signal

S&P 500 change per signal -1.25%
Average holding period 21 days

TESTING EFFECTIVENESS OF INDICATORS SHOWING POSITIVE DIVERGENCES

By David Vomund

DAVID VOMUND

Included in the Expert Design Studio (EDS) and in AIQ's Reports module are pre-built divergence screening reports. The reports typically use the Money Flow and On Balance Volume indicators when searching for divergences. Yet, divergence analysis can be applied to almost any technical indicator. Even a lagging indicator like the MACD can show a negative divergence when an uptrending stock starts to stall or can show a positive divergence when a downtrending stock begins to consolidate.

In this article, we'll use the Expert Design Studio to test the effectiveness of a variety of indicators by examining stock price movement after a positive divergence is seen.

Let's first review what a positive divergence is. A positive divergence occurs when a security is moving lower at the same time that an indicator is moving higher. An example is shown in **Figure 5**. In late April, we see that the price of Adams Express was moving lower. At the same time, its Money Flow indicator was moving higher and was at a new high on May 1.

In our testing for positive divergences, we used the Money Flow Divergence UP rule, one of the Pre-built Rules that come with EDS. Here is the rule:

Rule1 if Slope([Mnyflow],15)>0 and Slope([close],15)<0.

To individually test the other indicators, we simply pasted the different indicator names in Money Flow's place and ran the backtest.

In our first test, we screened for positive 15-day divergences. That is, we looked for situations where the 15-day slope of the stock was moving lower at the same time that a 15-day slope of the indicator was moving higher. A sell criteria of 90% principle protect and a 90% profit protect above 10% was used. The testing time frame was from 12/31/93 to 05/14/98. The stock database consisted of the S&P 500 and Nasdaq 100 stocks.

Table 3 shows the results of testing 14 different indicators for positive divergences. The first thing we notice is that the results are pretty similar no matter which indicator is used. This is not too surprising because we are not testing a strict screening. Every divergence, no matter how small, is used. In fact, each indicator produced about 17,000 trades! With that many

trades we know that the results will be fairly similar to the market. We also know that with that amount of trades, the results are reliable since the random element is not present.

Looking at the Average Annual ROI, we see that the most effective indicator for spotting 15-day divergences is the Velocity indicator. This result will surprise many people, as it is one of the least used indicators in our system. Velocity was added to TradingExpert's indicator library only two versions ago. This indicator simply looks at the rate of change in price movement. The next most effective indicators are the MACD, On Balance Volume Percentage, and Positive Volume Index. The least effective are RSMD Index SPX and the Stochastic.

The effectiveness of each indicator in screening for positive divergences can vary depending on the time horizon used in the test and the sell strategy. With this in mind, we



EDS ANALYSIS *continued* . . .

performed the same test using a shorter time frame and a tighter stop strategy. Instead of using 15 days for positive divergences, we had the system screen for 7 days. Our sell strategy consisted of a 93% principle protect and a 90% profit protect above 5%.

The results of this second test are found in **Table 4**. Using the shorter term technique, the average holding period was about 19 days, half that of our first test. Amazingly, most of the results are consistent with our earlier test. Velocity once again proved to be the most effective indicator with an Average Annual ROI of 22.01%. On Balance Volume Percentage and the MACD continued to post above average results. RSMD and the Stochastic once again were less than average. This time, the Negative Volume Index also performed poorly.

The results of our divergence analysis will be helpful in our creation of future EDS models. After this analysis, we know that the Velocity indicator should be used in any model that incorporates divergence analysis. We also know that MACD and OBV Pct. work well. In this month's testing we traded every divergence, no matter how small. In further testing, we'll change our criteria to trade the stocks with more significant divergences.

In April's *Opening Bell* we published an affective EDS model which incorporated divergence analysis. We knew that we'd be able to improve the model because we had only scratched the surface in our EDS testing. In an upcoming article we will fine-tune that initial EDS model. The results of this month's divergence testing will play a role in the new model. ■

Vomund publishes VIS Alert, a weekly investment newsletter. For a sample copy go to www.visalert.com or call (702) 831-1544.

Table 3**15 Day Divergence****Sell Criteria: 90, 90, 10**

	Average Profit/Loss	Avg. Holding Period Period (days)	Average Annual ROI
CCI	3.23%	40	20.10%
DirMov	3.46%	40	21.36%
MACD	3.58%	41	21.83%
MnyFlow	3.61%	42	21.22%
MF RSI	3.38%	41	20.77%
N-Vol	3.41%	41	20.64%
OBV	3.48%	42	20.74%
OBV Pct	3.52%	40	21.73%
P-Vol	3.42%	41	20.62%
RS Indx SPX	3.61%	43	20.74%
RSMD SPX	3.43%	46	18.65%
Stoc	3.23%	40	19.93%
Va Pct	3.42%	40	21.04%
Velocity	3.63%	40	22.57%

Table 4**7 Day Divergence****Sell Criteria: 93, 90, 5**

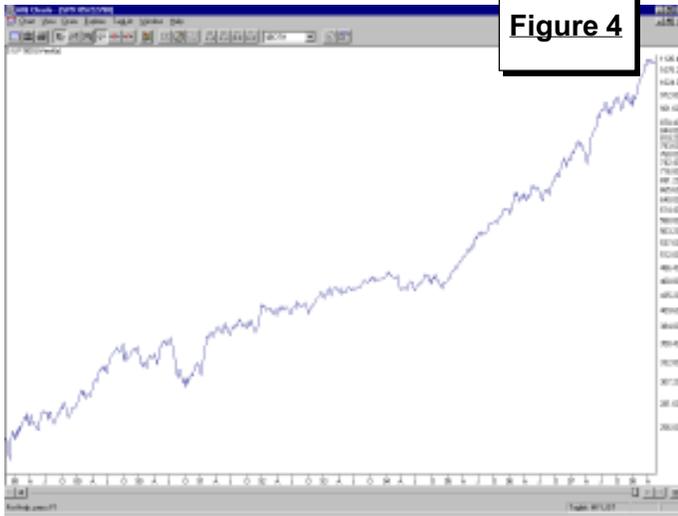
	Average Profit/Loss	Avg. Holding Period Period (days)	Average Annual ROI
CCI	1.50%	18	20.02%
DirMov	1.60%	18	21.25%
MACD	1.62%	19	21.27%
MnyFlow	1.54%	19	19.91%
MF RSI	1.59%	18	21.51%
N-Vol	1.46%	18	19.44%
OBV	1.66%	19	21.51%
OBV Pct	1.62%	18	21.74%
P-Vol	1.58%	19	20.60%
RS Indx SPX	1.63%	19	21.04%
RSMD SPX	1.62%	20	19.64%
Stoc	1.43%	18	19.48%
Va Pct	1.53%	18	20.52%
Velocity	1.65%	18	22.01%

MARKET TIMING *continued . . .*

produces a .72% loss. This is a small figure but this has been an incredibly bullish time period (**Figure 4**). The fact that the market fell at all during sell signals is fairly impressive.

On the buy side, the average gain per trade in the S&P 500 going back to 1985 is 4.38%. The average holding period is 54 days. Call AIQ if you would like a detailed listing of the buy signals.

In our sell signal testing we did not use a confirmation technique.



During periods of prolonged weakness, applying a confirmation technique will help keep you out of the market for a longer period of time. ■

MARKET REVIEW

People often have the misconception that AIQ's market timing signals are only on the Dow Jones Industrial Average. The market's activity last month shows why this is not true.

A 100 Sell signal was registered on May 5 due to weak market breadth. Although the Dow was moving sideways, the majority of stocks on the New York Stock Exchange were decreasing.

Since the original sell on April 17, the Dow and S&P 500 have moved sideways but the broader market has corrected. From its high point, the Russell 2000 has decreased 8% and the Nasdaq Composite has decreased 7%.

STOCK DATA MAINTENANCE

The following table shows past and future stock splits and large dividends:

Stock	Ticker	Split/Div.	Approx. Date	Stock	Ticker	Split/Div.	Approx. Date
Republic NY Corp.	RNB	2:1	06/02/98	Grainger (WW)	GWW	2:1	06/15/98
Courier Corp	CRRC	3:2	06/02/98	Chase Manhattan	CMB	2:1	06/15/98
Amazon.Com	AMZN	2:1	06/02/98	Comdisco Inc.	CDO	2:1	06/16/98
Washington Mutual	WAMU	3:2	06/02/98	Best Buy	BBY	2:1	06/16/98
i2 Technologies	ITWO	2:1	06/03/98	Control Devices	SNSR	5:4	06/16/98
Matthews Int'l Corp	MATW	2:1	06/03/98	Encore Wire Corp	WIRE	3:2	06/16/98
Bindley Western	BDY	4:3	06/04/98	Air Prod & Chem	APD	2:1	06/16/98
Coastal Corp	CGP	4:3	06/04/98	CVS Corp	CVS	2:1	06/16/98
Gillette Co.	G	2:1	06/08/98	DeVry Inc.	DV	2:1	06/22/98
Belo AH	BLC	2:1	06/08/98	RLI Corp	RLI	5:4	06/22/98
AFLAC Inc.	AFL	2:1	06/09/98	Bank Boston Corp	BKB	2:1	06/23/98
SkyWest Inc.	SKYW	2:1	06/09/98	Micros Systems	MCRS	2:1	06/23/98
Sierra Health Svs.	SIE	3:2	06/09/98	Jones Apparel Group	JNY	2:1	06/26/98
AMR Corp	AMR	2:1	06/10/98	Marsh & McLennan	MMC	2:1	06/29/98
Labor Ready Inc.	LBOR	3:2	06/10/98	Storate Tech.	STK	2:1	06/29/98
HBO & Co.	HBOC	2:1	06/10/98	Bell Atlantic	BEL	2:1	06/30/98
Ducommun Inc.	DCO	3:2	06/11/98	CNB Financial	CNBF	2:1	07/01/98
Equinox Systems	EQNX	3:2	06/11/98	Chart Industries	CTI	3:2	07/01/98
Sanmina Corp	SANM	2:1	06/11/98	Nordstrom Inc.	NOBE	2:1	07/01/98
Carnival Corp	CCL	2:1	06/15/98				

Name/Ticker Changes:

Stanhme Inc. (STH) to Enesco Group Inc (ENC), Thiokol Corp (TKC) to Cordant Technologies Inc. (CDD), Wainoco Oil Corp (WOL) to Frontier Oil Corp. (TFO)

Trading Suspended:

CoreStates Financial Corp (CFL), Jabil Circuit Inc (JBIL), KU Energy Corp (KU), Piper Jaffray Cos. (PJC), USF&G Corp (FG)