

The Derivative Oscillator: A New Approach for an Old Problem

by Connie Brown

Introduction

Traditional momentum indicators frequently offer accurate confirmation to the completion of textbook Elliott Wave Principle patterns. However, complex wave patterns remain a challenge for analysts. Complex Elliott Wave patterns develop when a simple three wave correction becomes the first wave within a larger corrective pattern. Other complex patterns develop when extensions unfold. These Elliott Wave patterns frequently cause incorrect or premature buy/sell signals from traditional momentum indicators such as Momentum, RSI, Stochastics, and MACD. The need to minimize these incorrect momentum indicator signals, while maintaining the original additive value of these studies with the Wave Principle, has led to the development of a derivative oscillator.

The oscillator is a triple smoothed derivative of RSI plotted as a histogram. The histogram has the added benefit of frequently displaying *precise* equality relationships between the amplitude of crest highs and trough lows. This mathematical equality adds visual clarity to the identification of high risk pivot levels for a market without the usual lag time limitation. The objective of this paper is to explain the use of this indicator, demonstrate how it is currently being used in conjunction with the Elliott Wave Principle, and identify potential areas for further research. After three years of development, testing, and real-time performance evaluation, this indicator is being offered to the Technical Analysis community for the first time.

Pros and Cons of Momentum Indicators with The Elliott Wave Principle

Robert Prechter and A.J. Frost write in the *Elliott Wave Principle*, "As waves are in the process of unfolding, there are times when several different wave counts are perfectly admissible under all known Elliott rules" (p.68). They further add, "it is at these junctures that a knowledge of wave personality can be invaluable." Supporting technical indicators, such as momentum, help the analyst identify the personality of specific waves in the

Elliott sequence. As an example, a fifth wave when compared to a third wave is frequently accompanied by momentum divergence as the fifth wave is usually less dynamic. Traditional momentum studies perform well in such text book pattern scenarios.

More challenging Elliott Wave patterns tend to cause multiple entry/exit signals from traditional momentum indicators. This can be demonstrated when an impulsive fifth wave extends into a nine or thirteen wave structure. Extensions temporarily renew dwindling volume and yield multiple diverging momentum signals which can be misleading to the analyst and costly for the trader. Complex corrective Elliott Wave patterns also cause timing difficulties for momentum indicators. The simplest three wave correction, labeled a-b-c, would ideally be followed by a distinct, impulsive five wave structure. However, should the market then develop a choppy, nearly indiscernible wave structure uncharacteristic of an impulsive five wave pattern, the choppy wave personality would warn the analyst that the correction is incomplete. The first a-b-c structure likely completed wave A within a larger A-B-C corrective pattern. Wave B can then unfold with several different admissible counts. Incorrect momentum signals, in conjunction with several equally viable wave interpretations, can make it extremely difficult to correctly identify the completion of wave B. The momentum indicator problem will be illustrated and described in detail when a new indicator is compared to RSI in *Chart 7* and MACD in *Chart 8*.

Introducing the Derivative Oscillator

The Elliott Wave Principle provides the analyst with a sequence which serves to map the current position of a market. The Elliott Wave practitioner knows when a pattern is complete but needs a warning when a more extensive pattern should be expected. In these situations fewer signals generated by a momentum indicators would be of greater value than numerous signals which serve to warn that a market is in the process of forming a top or bottom. *Charts 1a, 1b, and 1c* illustrate the DJIA in a daily time interval. The oscillator directly below the bar

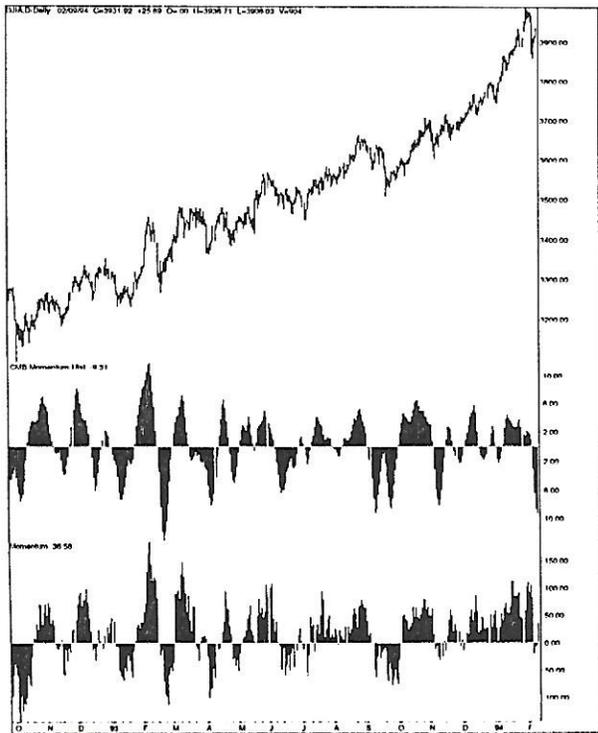


CHART 1a

chart is a Derivative Oscillator plotted as a histogram. The histogram is labeled CMB Momentum-Hist throughout charts 1a-1c. In Chart 1a, a traditional Momentum study is plotted by TradeStation

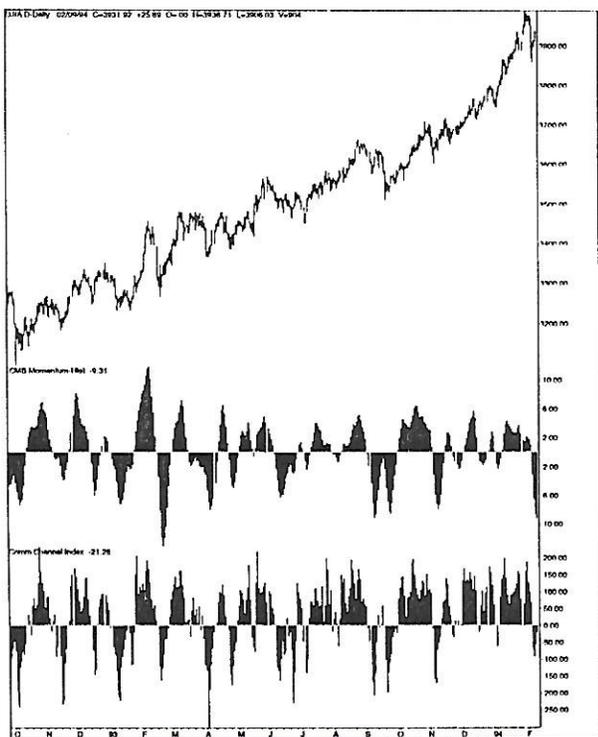


CHART 1b

at the bottom of the page. First visual comparison of these two histograms shows the objective of developing a momentum indicator with fewer signals has been accomplished. The histogram directly below the bar chart shows very distinct and clean crest peaks and trough lows when compared to Momentum. Chart 1b illustrates this similar comparison to the Commodity Channel Index. Chart 1c demonstrates Rate of Change. In terms of visual clarity, the Derivative Oscillator shows promise.

The DJIA illustrates an upward trending market during October 1992 to February 1994 time frame of

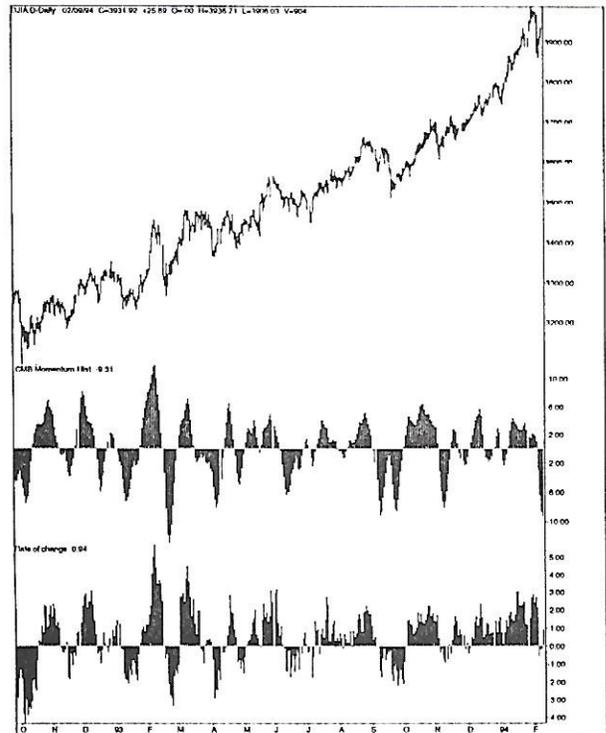


CHART 1c

Charts 1a, 1b, and 1c. An indicator frequently demonstrates strength during a trending market or a sideways consolidation, but rarely offers significant value in both market conditions. *Charts 2a, 2b, and 2c* illustrate a daily Cash S&P bar chart with the same indicators displayed in Charts 1a to 1c. The Cash S&P market demonstrates a general upward trend interrupted by two large contracting triangles. The triangles have been marked on the charts. More traditional momentum studies give multiple signals in complex corrective patterns, therefore it was important to have an indicator which could offer value during consolidations and perform in strong trending markets where extensions are expected. The rough visual comparison seems to show promise in both market conditions. A more rigorous evaluation on the

profitability potential of the Derivative Oscillator was then indicated.

The Derivative Oscillator Formula

The Derivative Oscillator is a triple smoothed RSI. The formula incorporates two exponential moving averages and a simple moving average.

STEP 1: An exponential average of RSI is calculated.

STEP 2: The result in Step 1 is used to produce a new exponential average using a shorter period than that used in Step 1.

STEP 3: A simple moving average is then obtained from the result in Step 2.

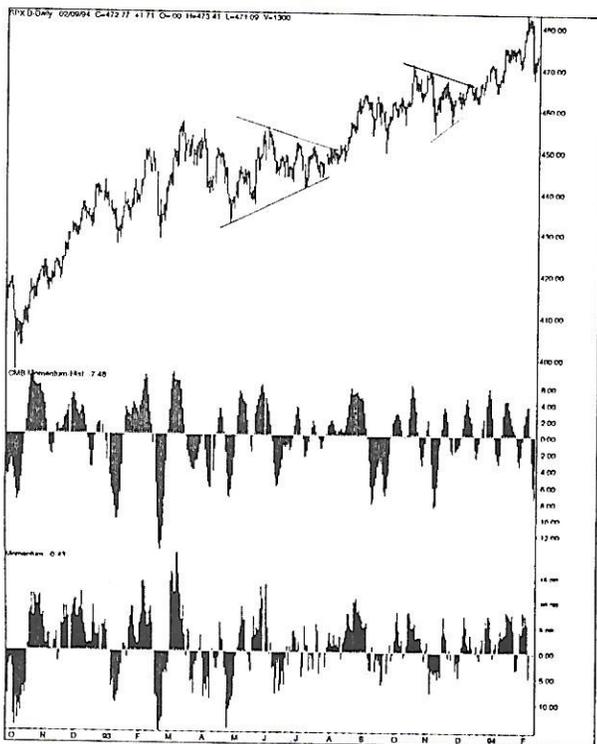


CHART 2a

STEP 4: Obtain the difference between the results obtained in Step 2 and 3. The result is then charted as a histogram.

Omega TradeStation and SuperCharts both use the symbol 'XAverage' to denote an exponential moving average. A custom formula can be created for both these products in the following manner:
 $(XAverage(XAverage((RSI(Close,length)),Period1),Period2)) - (Average(XAverage(XAverage((RSI(Close,14)),Period1),Period2),Period3))$

Using "input names" for the exponential and

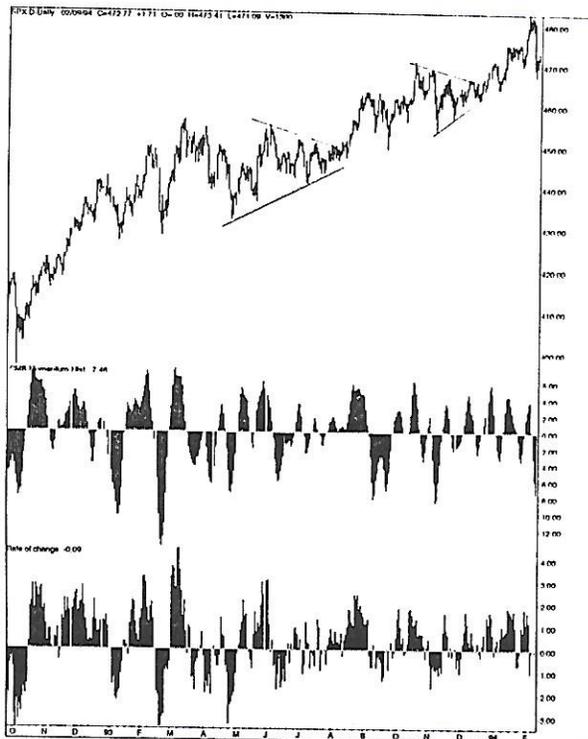


CHART 2b

simple averages will allow easy adjustment to these variables. The DJIA and S&P markets should both use a 14 period RSI and the following periods for hourly and daily analysis:

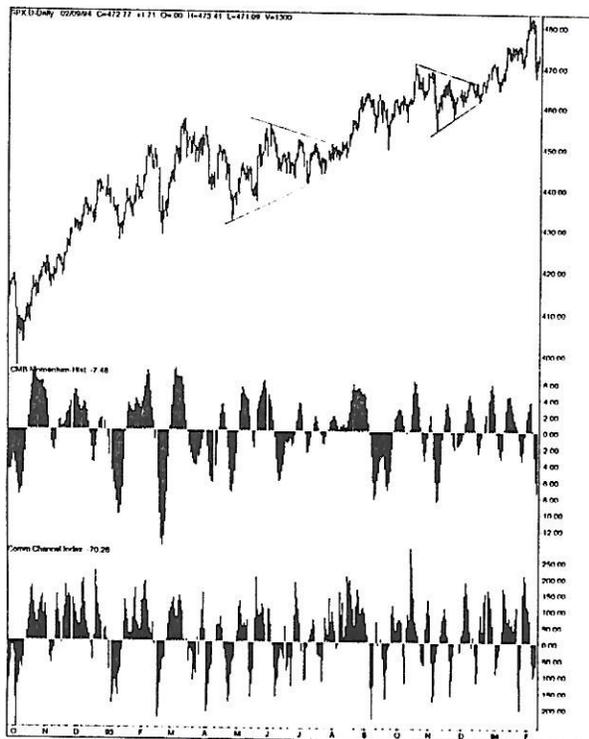


CHART 2c

Study	InputName	Default Value
RSI	Length	14
XAverage	Period1	5
XAverage	Period2	3
Average	Period3	9

Telerate's TeleTrac and the Snap module within CompuTrac would be setup in the following manner:

TYPE	NAME	DEFINITION
COEF	rsicoef	14
COEF	period1	5
COEF	period2	3
COEF	period3	9
STUDY	rsi	RSI(last,rsicoef)
STUDY	exp_ma	Exp_ma(rsi,period1)
STUDY	exp_ma2	EXP_ma(exp_ma,period2)
STUDY	mov_avg	Mov_avg(exp_ma2,period3)
STUDY	deriv_os	Osc(exp_ma2,mov_avg)

(Plot the last line as a histogram.)

A Profitability Evaluation of the Derivative Oscillator for the DJIA

The preliminary visual examination of the Derivative Oscillator showed distinct crests and troughs. A more thorough evaluation was indicated to test the actual profitability of the oscillator signals. Table 1 lists all the daily buy and sell signals generated by the Derivative Oscillator for the DJIA over the period of July 22, 1992, to February 4, 1994. The full evaluation covered a 20 year look back period in the DJIA, and a six year look back for the Cash S&P and OEX (S&P 100) markets. Table 1 is a detailed listing showing a portion of the test results.

The criteria used to generate the buy/sell signals follows:

BUY: Enter a long position when the current period of the Derivative Oscillator is greater than the prior period of the Oscillator. More simply stated, go long when ever the oscillator changes direction and begins to advance. Instead of using the next day's open to enter a long position, *use the next day's close to provide a worse case scenario* to cover slippage, commission, and intraday confirmation after the signal has been triggered. No criteria was established to require an oscillator bottom within a specified range. A turn upwards in the oscillator at the -10 level was given equal weighting as a signal generated at +.02. Once the system was long it could not add multiple positions when secondary signals were generated. The objective is to find an indicator which does not give several premature signals, therefore this restriction was incorporated. Indicator whipsaw had to be evaluated. This was accomplished by permitting short positions to be reversed to a long position if

the current Derivative Oscillator was greater than the prior period, and the Derivative Oscillator calculation two periods back was greater than the prior period. This allowed a short position to be reversed to a long position when ever the oscillator began to advance changing a former down trend.

SELL: Exact logic used for buy signals but reversed.

ASSUMPTIONS: Always in the market.

STOPS: Neither trailing, percentage loss, nor profit stop losses were used to record actual gains and losses between oscillator signals. Trailing profit protection stops and incorporating percentage stop losses would have significantly increased profits according to further test evaluation.

A summary of the test results from 7/22/92 to 2/4/94 yielded a cumulative profit in DJIA of +269.49 points. The objective of this test was to determine if the oscillator showed some merit on its own before divergence analysis and other observations could be applied which would increase the indicators' performance. The test results from the DJIA, S&P Cash, and OEX were viewed promising and justified further evaluation of the indicator.

The test results for the time period illustrated in Table 1 can be summarized:

Total Net Profit: +269.49 DJIA points.
Gross Profit: 1162.72 DJIA points.
Gross loss: -893.23 DJIA points.

The total number of winning trades: 31 out of a total of 71 signals.

The largest winning position: 141.29 DJIA points.
The largest losing position: -57.02 DJIA points.

The average winning trade: 37.51 DJIA points.
The average losing trade: -22.33 DJIA points.

The win/loss ratio is 1.68. (Remember there are no stops.)

The average winning position was 9 days in duration, losers averaged 3 days duration.

The complete test results from the period 7/22/92 to 2/4/94 follow in Table 1 and then accompanying charts mark when each buy/sell signal occurred.

In the chart showing buy/sell signals from August 1992 to February 1993, the letters 'A' and 'B' have been marked on this chart. The very distinct sell signal at 'A' and then the buy signal at 'B' are not captured by the logic used to generate the black box test signals. One of the objectives of the profitability test was to test premature signals. The logic therefore does not permit multiple entry/exit signals. A few premature signals will be seen in the charts for Table 1, they are limited and final test

CMB Momtm/3x3		DJIA.D-Daily		05/12/92 - 02/09/94			
Date	Time	Type	Cnts	Price	Signal Name	Entry P/L	Cumulative
07/22/92		Buy	1	3277.61			
07/27/92		LExit	1	3282.20		\$ 4.59	\$ 4.59
07/27/92		Sell	1	3282.20			
07/28/92		SExit	1	3334.07		\$ -51.87	\$ -47.28
07/28/92		Buy	1	3334.07			
08/05/92		LExit	1	3365.14		\$ 31.07	\$ -16.21
08/05/92		Sell	1	3365.14			
08/18/92		SExit	1	3329.48		\$ 35.66	\$ 19.45
08/18/92		Buy	1	3329.48			
08/19/92		LExit	1	3307.06		\$ -22.42	\$ -2.97
08/19/92		Sell	1	3307.06			
08/28/92		SExit	1	3267.61		\$ 39.45	\$ 36.48
08/28/92		Buy	1	3267.61			
09/08/92		LExit	1	3260.59		\$ -7.02	\$ -29.46
09/08/92		Sell	1	3260.59			
09/10/92		SExit	1	3305.16		\$ -44.57	\$ -15.11
09/10/92		Buy	1	3305.16			
09/17/92		LExit	1	3315.70		\$ 10.54	\$ -4.57
09/17/92		Sell	1	3315.70			
10/12/92		SExit	1	3174.41		\$ 141.29	\$ 136.72
10/12/92		Buy	1	3174.41			
10/19/92		LExit	1	3188.45		\$ 14.04	\$ 150.76
10/19/92		Sell	1	3188.45			
10/21/92		SExit	1	3187.10		\$ 1.35	\$ 152.11
10/21/92		Buy	1	3187.10			
10/30/92		LExit	1	3226.28		\$ 39.18	\$ 191.29
10/30/92		Sell	1	3226.28			
11/02/92		SExit	1	3262.21		\$ -35.93	\$ 155.36
11/02/92		Buy	1	3262.21			
11/04/92		LExit	1	3223.04		\$ -39.17	\$ 116.19
11/04/92		Sell	1	3223.04			
11/11/92		SExit	1	3240.33		\$ -17.29	\$ 98.90
11/11/92		Buy	1	3240.33			
11/12/92		LExit	1	3239.79		\$ -0.54	\$ 98.36
11/12/92		Sell	1	3239.79			
11/20/92		SExit	1	3227.36		\$ 12.43	\$ 110.79
11/20/92		Buy	1	3227.36			
12/03/92		LExit	1	3276.53		\$ 49.17	\$ 159.96
12/03/92		Sell	1	3276.53			
12/07/92		SExit	1	3307.33		\$ -30.80	\$ 129.16
12/07/92		Buy	1	3307.33			
12/11/92		LExit	1	3304.08		\$ -3.25	\$ 125.91
12/11/92		Sell	1	3304.08			
12/18/92		SExit	1	3313.27		\$ -9.19	\$ 116.72
12/18/92		Buy	1	3313.27			
12/29/92		LExit	1	3310.84		\$ -2.43	\$ 114.29
12/29/92		Sell	1	3310.84			
12/30/92		SExit	1	3321.10		\$ -10.26	\$ 104.03
12/30/92		Buy	1	3321.10			
12/31/92		LExit	1	3301.11		\$ -19.99	\$ 84.04
12/31/92		Sell	1	3301.11			
01/14/93		SExit	1	3267.88		\$ 33.23	\$ 117.27
01/14/93		Buy	1	3267.88			
01/19/93		LExit	1	3255.99		\$ -11.89	\$ 105.38
01/19/93		Sell	1	3255.99			
01/25/93		SExit	1	3292.20		\$ -36.21	\$ 69.17
01/25/93		Buy	1	3292.20			
02/11/93		LExit	1	3422.69		\$ 130.49	\$ 199.66
02/11/93		Sell	1	3422.69			
02/22/93		SExit	1	3342.99		\$ 79.70	\$ 279.36
02/22/93		Buy	1	3342.99			
03/12/93		LExit	1	3427.82		\$ 84.83	\$ 364.19
03/12/93		Sell	1	3427.82			
03/18/93		SExit	1	3465.64		\$ -37.82	\$ 326.37

TABLE 1

CMB Momtm/3x3		DJIA.D-Daily		05/12/92 - 02/09/94			
Date	Time	Type	Cnts	Price	Signal Name	Entry P/L	Cumulative
03/18/93		Buy	1	3465.64			
03/24/93		LExit	1	3445.38		\$ -20.26	\$ 306.11
03/24/93		Sell	1	3445.38			
03/30/93		SExit	1	3457.27		\$ -11.89	\$ 294.22
03/30/93		Buy	1	3457.27			
03/31/93		LExit	1	3435.11		\$ -22.16	\$ 272.06
03/31/93		Sell	1	3435.11			
04/12/93		SExit	1	3428.09		\$ 7.02	\$ 279.08
04/12/93		Buy	1	3428.09			
04/20/93		LExit	1	3443.49		\$ 15.40	\$ 294.48
04/20/93		Sell	1	3443.49			
04/29/93		SExit	1	3425.12		\$ 18.37	\$ 312.85
04/29/93		Buy	1	3425.12			
05/07/93		LExit	1	3437.19		\$ 12.07	\$ 324.92
05/07/93		Sell	1	3437.19			
05/11/93		SExit	1	3468.75		\$ -31.56	\$ 293.36
05/11/93		Buy	1	3468.75			
05/14/93		LExit	1	3443.01		\$ -25.74	\$ 267.62
05/14/93		Sell	1	3443.01			
05/19/93		SExit	1	3500.03		\$ -57.02	\$ 210.60
05/19/93		Buy	1	3500.03			
06/07/93		LExit	1	3532.13		\$ 32.10	\$ 242.70
06/07/93		Sell	1	3532.13			
06/16/93		SExit	1	3511.65		\$ 20.48	\$ 263.18
06/16/93		Buy	1	3511.65			
06/18/93		LExit	1	3494.77		\$ -16.88	\$ 246.30
06/18/93		Sell	1	3494.77			
06/21/93		SExit	1	3510.82		\$ -16.05	\$ 230.25
06/21/93		Buy	1	3510.82			
06/22/93		LExit	1	3497.53		\$ -13.29	\$ 216.96
06/22/93		Sell	1	3497.53			
06/28/93		SExit	1	3530.20		\$ -32.67	\$ 184.29
06/28/93		Buy	1	3530.20			
07/02/93		LExit	1	3483.97		\$ -46.23	\$ 138.06
07/02/93		Sell	1	3483.97			
07/08/93		SExit	1	3514.42		\$ -30.45	\$ 107.61
07/08/93		Buy	1	3514.42			
07/22/93		LExit	1	3525.22		\$ 10.80	\$ 118.41
07/22/93		Sell	1	3525.22			
07/23/93		SExit	1	3546.74		\$ -21.52	\$ 96.89
07/23/93		Buy	1	3546.74			
07/30/93		LExit	1	3539.47		\$ -7.27	\$ 89.62
07/30/93		Sell	1	3539.47			
08/06/93		SExit	1	3560.99		\$ -21.52	\$ 68.10
08/06/93		Buy	1	3560.99			
08/13/93		LExit	1	3569.65		\$ 8.66	\$ 76.76
08/13/93		Sell	1	3569.65			
08/16/93		SExit	1	3579.71		\$ -10.06	\$ 66.70
08/16/93		Buy	1	3579.71			
09/01/93		LExit	1	3645.10		\$ 65.39	\$ 132.09
09/01/93		Sell	1	3645.10			
09/13/93		SExit	1	3634.20		\$ 10.90	\$ 142.99
09/13/93		Buy	1	3634.20			
09/17/93		LExit	1	3613.25		\$ -20.95	\$ 122.04
09/17/93		Sell	1	3613.25			
09/27/93		SExit	1	3567.70		\$ 45.55	\$ 167.59
09/27/93		Buy	1	3567.70			
11/03/93		LExit	1	3661.87		\$ 94.17	\$ 261.76
11/03/93		Sell	1	3661.87			
11/10/93		SExit	1	3663.55		\$ -1.68	\$ 260.08
11/10/93		Buy	1	3663.55			
11/22/93		LExit	1	3670.25		\$ 6.70	\$ 266.78
11/22/93		Sell	1	3670.25			
11/26/93		SExit	1	3683.95		\$ -13.70	\$ 253.08

CMB Momtm/3x3		DJIA.D-Daily		05/12/92 - 02/09/94			
Date	Time	Type	Cnts	Price	Signal Name	Entry P/L	Cumulative
11/26/93		Buy	1	3683.95			
11/29/93		LExit	1	3677.80		\$ -6.15	\$ 246.93
11/29/93		Sell	1	3677.80			
11/30/93		SExit	1	3683.95		\$ -6.15	\$ 240.78
11/30/93		Buy	1	3683.95			
12/15/93		LExit	1	3716.92		\$ 32.97	\$ 273.75
12/15/93		Sell	1	3716.92			
12/17/93		SExit	1	3751.57		\$ -34.65	\$ 239.10
12/17/93		Buy	1	3751.57			
12/31/93		LExit	1	3754.09		\$ 2.52	\$ 241.62
12/31/93		Sell	1	3754.09			
01/05/94		SExit	1	3798.82		\$ -44.73	\$ 196.89
01/05/94		Buy	1	3798.82			
02/04/94		LExit	1	3871.42		\$ 72.60	\$ 269.49
02/04/94		Sell	1	3871.42			



TABLE 1: Buy/Sell Signals from Aug '92 to Feb '93
(signals are charted next day on market close)

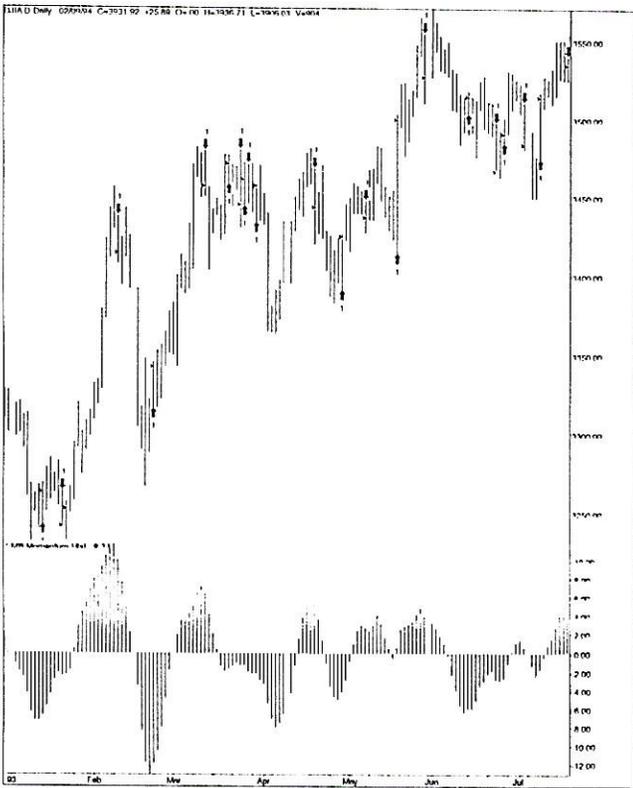


TABLE 1: Buy/Sell Signals from Jan '93 to Aug '93
(signals are charted next day on market close)

results show a positive return even without multiple entry signals.

The test results are not conclusive but are viewed a preliminary and important step taken during the development phase of the Derivative Oscillator. The effect of using different periods for the RSI and moving averages within the formula will be discussed at a later time in this paper.

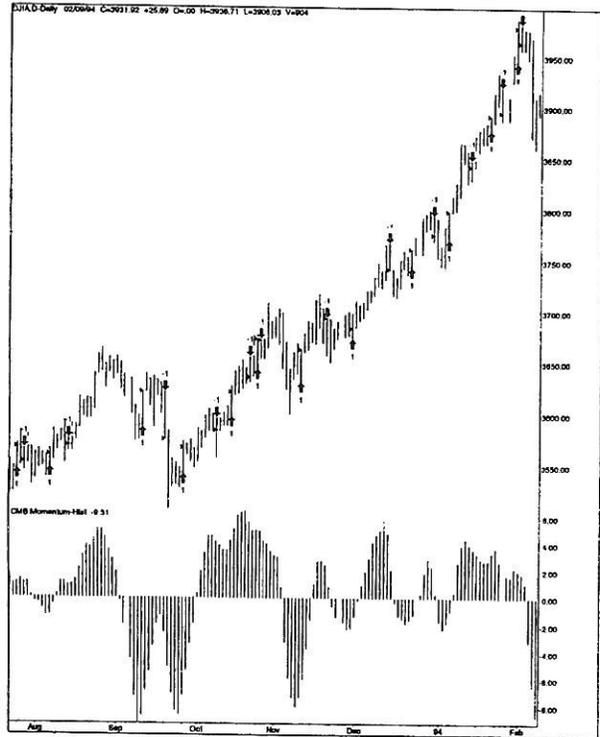


TABLE 1: Buy/Sell Signals from Aug '93 to Feb '94
(signals are charted next day on market close, positions could have been entered on market open)

How to Interpret the Derivative Oscillator

The profitability test results justified continued development of the oscillator and observations within a real-time context of the oscillator suggest the following guidelines for its use and application.

Amplitude Equality

The first observation of the Derivative Oscillator is the number of relatively few oscillator crests and troughs. Upon a more careful evaluation of these peaks and lows, an equal and opposite reaction can be expected. Let's take a close look at *Chart 3*. In this chart a strong rally developed into the momentum peak labeled 'C'. A peak extreme in the DJIA is considered any momentum value which exceeds +10. When such occurrences develop, an analyst can expect a momentum low of equal magnitude in both hourly and daily charts. The momentum peak at 'C' has a peak high of +11.89. A momentum low marked 'c' then attains an extreme value of -12.93 with

momentum lows on either side of the trough low near equality at -11.86 . The momentum low does not have to immediately follow the momentum high as demonstrated between 'C' and 'c'. However, after the extreme momentum low has been attained, the analyst can expect the next momentum high to be equal to the momentum high preceding the extremes. In Chart 3 the momentum low at 'B' has a value of -7.19 and the momentum high at 'b' has a value at the peak of $+7.17$. Again displaying near equality. The observer will find this attribute of the indicator occurs several times within the same chart. Amplitude equality is attained between momentum crests and troughs labeled at points 'A' and 'a', 'D' and 'd', and again between 'E' and 'e'. The equality attribute provides a distinct objective for an analyst to mark a high risk pivot level for the market.

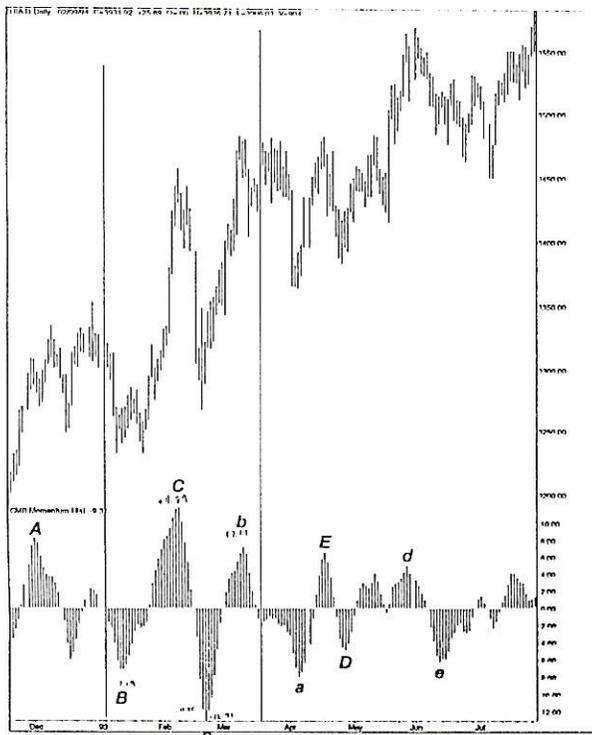


CHART 3

The characteristic of equal and opposite momentum amplitudes is attributed to the market's cycles. Further study is indicated.

In addition to frequent momentum equality, other analytic techniques such as divergence analysis should be applied to the Derivative Oscillator. In Chart 4, the momentum lows labeled 'A' and 'B' show bullish divergence with the corresponding price lows marked 'A' and 'B'. A substantial rally then unfolded in the DJIA.

Three dashed lines are marked 'M' to help the

observer align important trend reversals in the oscillator with price. At these pivot levels, the oscillator reversed before a momentum high or low developed on the opposite side of the zero line. In each case marked 'M', the former near term price trend resumed with conviction. When the oscillator velocity begins to show no net gain/loss, or when the oscillator actually reverses its trend, a significant short term buy/sell signal can be realized as early as the next day in the market. The momentum peaks labeled 5, 6, and 7, do not confirm the price highs and bearish divergence develops between oscillator and price. When a series of new price highs are accompanied by diminishing momentum peaks descending toward the zero line, a sharp price breakdown can be expected *before the oscillator crosses the zero line*. Each oscillator pivot between the peaks labeled 5,

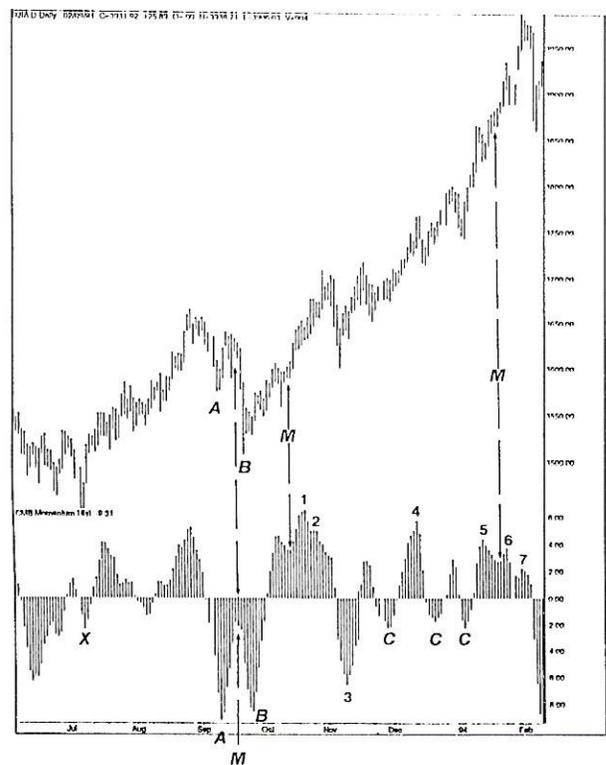


CHART 4

6, and 7, helped to warn that the developing market top was not in place. The peak at point 7 would be given a high probability of marking a top preceding a decline because the oscillator peaked marginally above $+2.00$ and then proceeded to decline further towards the zero line while prices stalled for two days. In this example the price high associated with the momentum peak at point 7 had completed an Elliott Wave pattern which fit the profile suggested by the oscillator. Peaks 5, 6, and 7 also display bearish divergence with the momentum peaks 1 and 4.

The momentum low in November marked point 3 has an equality relationship with the October momentum high at point 1. An analyst can suspect point 3 will be a high probability pivot level for the market based on the discussion for Chart 3.

Three small momentum lows are labeled 'C' in December 1993 to January of 1994. Shallow oscillator declines which have turned upwards frequently mark the end of a correction within an upwards trending market. *Visa versa* in a downwards trending market. In July of 1993, the price low on the far left of Chart 4 is accompanied by a shallow momentum low labeled 'X'. Bullish divergence at 'X' occurs with the momentum low in June 1993 and the secondary momentum pivot in late June of 1993. This combination of a shallow oscillator decline and bullish divergence should be interpreted as a significant nearby market bottom.

The three momentum lows labeled 'C' also suggest horizontal support and resistance levels can develop. This is more fully discussed with Chart 5.

Chart 5 simply demonstrates that momentum peaks can form horizontal resistance levels. The momentum peaks at points 1, 4, and 5 are repelled from the same horizontal resistance line. Point 3 shows a marginal breach of the resistance level, while point 6 failed just beneath it. When a momentum peak develops well above the horizontal resis-

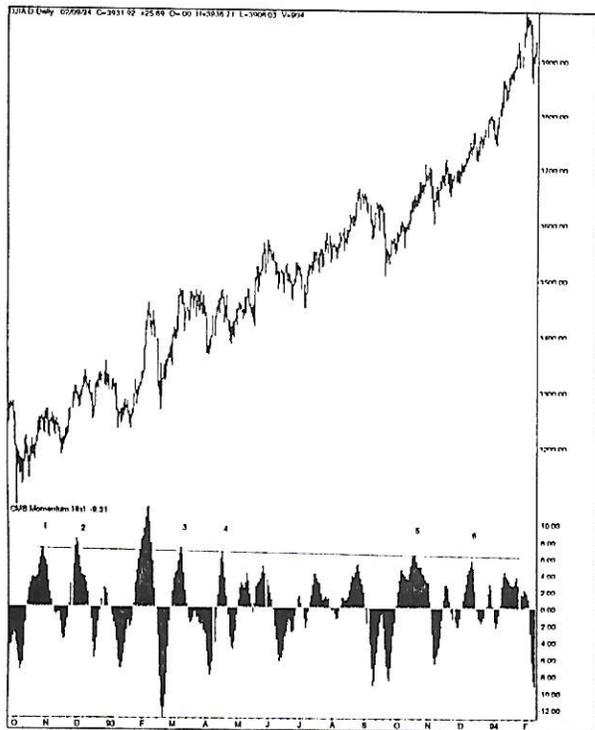


CHART 5

tance level, an analyst should expect the market to at least develop a momentum peak again which tests resistance, as is seen in point 3 after the extreme momentum high in January. Secondary horizontal resistance levels will form which are closer to the zero line. Momentum lows can also develop horizontal support levels.

Double bottoms and double tops have been witnessed. However, diagonal trend lines drawn from peak to peak or from trough to trough provide little information of value. The single exception is when a consolidation is unfolding in the market. Chart 6 offers an opportunity to discuss this exception.

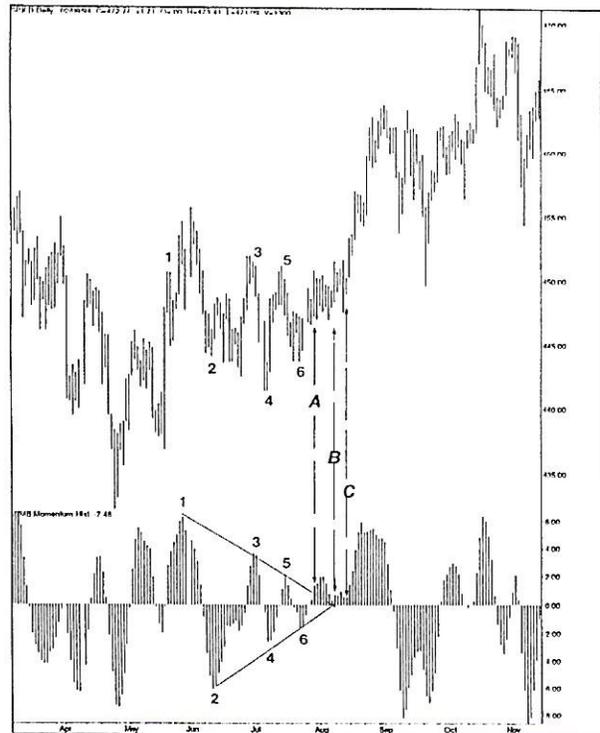


CHART 6

In Chart 6 the daily Cash S&P is displayed. A price consolidation causes the momentum peaks and troughs at points 1 through 6 to develop. These momentum points appear to form a distinct contracting triangle pattern. A contracting triangle pattern does not begin to develop in price until point 3. From point 3 to point 4, the Elliott Wave Principle suggests wave a down developed. The contracting triangle pattern observed in the Cash S&P price is considered complete at point 'B', where wave e forms a small contracting triangle itself. The Derivative Oscillator displays a series of contracting peaks and troughs which yield shorter trough amplitudes than the corresponding momentum peak amplitudes. The momentum low at point 2 is slightly shorter than that for peak

1, the same can be seen for the low at point 4 with the peak at 3, and similarly point 6 is shorter than peak 5. When a momentum consolidation develops in this formation, the analyst can expect the market to break in the direction of the longer momentum amplitudes, in this situation upwards.

The series of contracting momentum highs and lows can show an apex for the triangle which corresponds with the momentum trend reversal that occurs at point 'B'. Point 'A' shows the first breakout through the upper trendline connecting the momentum peaks. Further research is suggested, but this breakout appeared to be a valuable early buy signal. At point 'B' the oscillator illustrates a trend reversal discussed in Chart 4. This trend reversal in the oscillator triggers a buy signal at 'B', and again at 'C'. Point 'B' is the lowest risk entry for a long position. It is also the only point at which the momentum oscillator offers confirmation to a completed Elliott Wave pattern. A more thorough demonstration of how the Derivative Oscillator is used in conjunction with the Wave Principle will be offered shortly.

Similar momentum patterns have been observed with bearish resolutions. In these scenarios, the momentum peaks became progressively shorter than the amplitudes of the reaction momentum lows within the contracting triangle formation. A strong thrust downwards then followed just beyond the apex of the consolidation formation.

Chart 7 displays the daily Cash S&P with the Derivative Oscillator and a 14 period RSI.

At point '1' the RSI displays bearish divergence with price. The difficulty caused by this divergence is that a five wave advance can be considered complete from the February 1993 low into the price high one bar preceding point 1. This premature sell signal would prove costly later as the market then rallied six S&P points toward the March high. In contrast to the RSI at point 1, the up trend displayed in the Derivative Oscillator had not begun to roll over. This strongly suggested that an extension to the simple five wave structure should be suspected and that the rally was therefore incomplete. The next period in the oscillator does rollover, but the internal wave structure in price is corrective. The potential for the oscillator to form the descending peak formation towards the zero line would be given consideration at that time.

At point 2 in price the Derivative Oscillator is forming a flat plateau below the momentum peak. This is interpreted as rapid market decay and viewed as a sell signal when scaling into size positions. Histogram plateaus do not develop in market consolidations. When the oscillator first

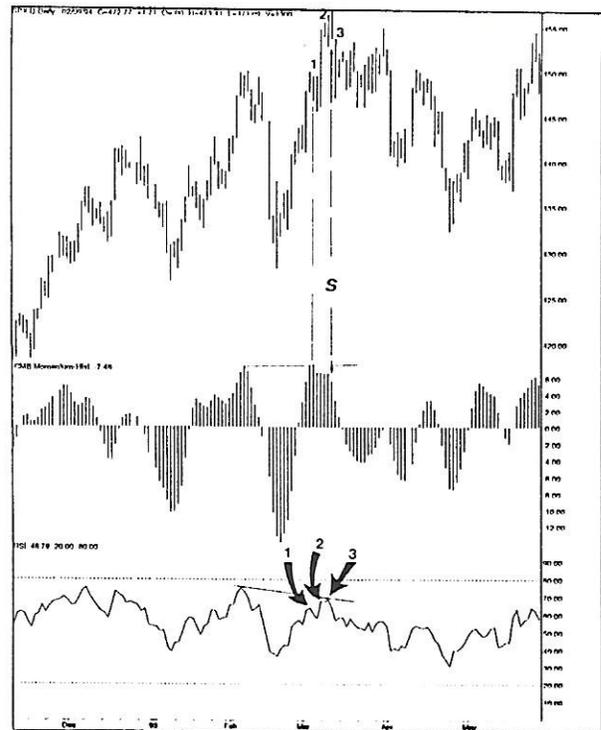


CHART 7

declines below the histogram plateau a fully leveraged short position should be established. The dashed line marked 'S' denotes the first pullback in the oscillator breaking the plateau in the histogram. This period in the histogram corresponds with the price high. The price high completes a nine wave progression from the February low which satisfies the completion of a five wave advance with an extension. Histogram plateaus rarely lead to the descending peak pattern described earlier in Chart 6, or an ascending peak progression in a bullish formation. A plateau can be interpreted as a rapid loss of market velocity which will lead to a trend reversal shortly after the plateau formation is broken.

The RSI at point 2 does not display divergence until the next day. A sell signal can then be viewed as accurate in this indicator.

The RSI at point 3 is caught on the wrong side of the market when a six point decline unfolds in the cash S&P. RSI divergence cannot be viewed until after point 3 and after the six point decline occurs. A costly late signal if point 2 was not acted upon after the premature signal at point 1 in the RSI.

This chart demonstrates the precise problem created by the RSI with the Wave Principle and why an alternative indicator was developed to offer fewer signals. The Derivative Oscillator does not replace

the RSI, but can be used to enhance the timing and warn of premature RSI signals.

Chart 8 displays the daily DJIA with the Derivative Oscillator and MACD. The MACD differential shows some similarity to the Derivative Oscillator at first glance. There are several very important differences between the signals suggested by these two indicators.

At point 'A' in the Derivative Oscillator, the bullish divergence was described in Chart 4. The same time interval marked 'B' in the MACD does not display any divergence with price. The MACD signal to buy in early October is regarded as too late for use with the Wave Principle.

Point 'C' in the Derivative Oscillator shows an important price bottom in place. The MACD displays a shallow differential trough in its histogram, which could be viewed bullish, but the signal at point 'X' in the MACD is confusing and longer horizon investors would view the second crossover in MACD in late November as a confirmed intermediate sell signal. In this scenario establishing a short position at the signal marked 'sell?' would lead to a position on the wrong side of the market. A sell signal could be interpreted at the same point in the Derivative Oscillator as the histogram does roll over. The position is covered near the same price as the position was established when the histogram rolls back up. The profit test in Table 1

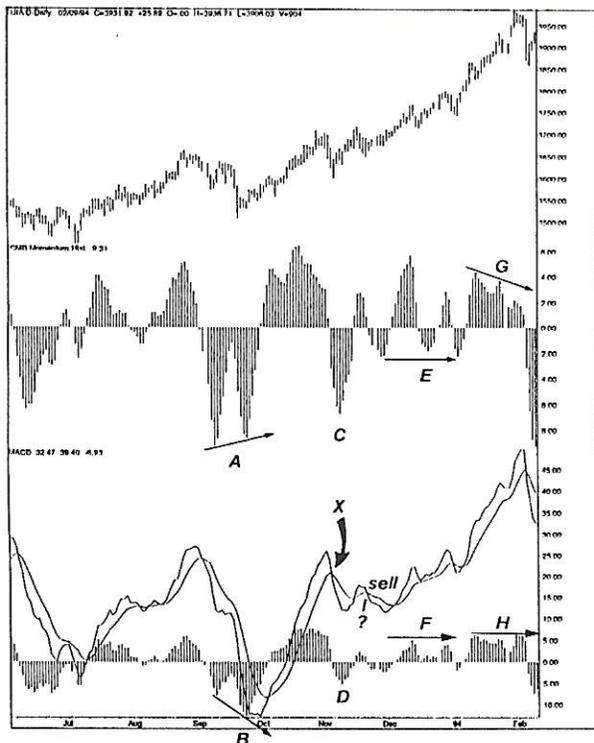


CHART 8

shows this signal represented a loss of -1.68 DJIA points, no loss occurs if the position had been reversed on market open rather than on market close.

Point 'E' in the Derivative Oscillator has already been described as short term bullish signals forming a horizontal trendline in the histogram. Point 'F' in the MACD is bullish by nature of a positive differential displayed, but does not suggest levels to add to existing positions, or at which levels to reestablish a long position if stopped out during the minor corrective declines.

Point 'G' in the Derivative Oscillator displays bearish divergence, while point 'H' in the MACD is considered confusing by this analyst. The MACD sell signal in early February lags the sharp market break which occurs in the fourth price bar from the far right hand side of the chart.

The MACD lag is viewed as a major obstacle for an indicator used in conjunction with the Wave Principle.

The Derivative Oscillator Applied Real Time

The original objective for developing an indicator with limited and timely signals was to compliment and support an analyst during complex Elliott Wave patterns, or to help warn the analyst when alternate patterns should be given a higher probability. A demonstration follows to show how the Derivative Oscillator is being used currently with hourly data of the DJIA and March S&P.

A market report is transmitted to subscribers each evening by Fax or through Reuters, Bloomberg, Telerate, and Knight-Ridder electronic quote screens. Five market reports follow which were transmitted to subscribers. The reports cover two important market turns for short term traders, the time horizon of interest for institutional subscribers to the *World Stock Markets Outlook*SM, or *Futures Outlook*SM. The hourly charts for both the DJIA and March S&P are included with notations to help the reader identify where the market closed when each report was prepared.

The Derivative Oscillator is plotted below the bar chart for each market.

In the right hand margin, beside the market report, are analysis notes to guide the reader to important relationships between price and oscillator which had an influence to this analyst's market opinion at that time. The combination of wave structure and oscillator was an invaluable combination for this analyst during this market transition and continues to be of value.