



Go With The Bias

# Analyzing Price Action In The S&P 500

*What will the market do the next day? Short-term traders look for some hints that suggest which way prices will move. Here's one approach you can use to help determine what the next trading day's bias will be.*

by Adel Weng, PhD



It is widely believed that price movements in the stock market, over time, tend to be repetitive. The constant daily actions of buying and selling by market participants, whether by humans or algorithms, can be manifested in price patterns. Short-term directional traders who actively trade the emini index futures contracts are always analyzing these end-of-day (EOD) price patterns for any clues or hints, trying to determine whether the market will be up or down the next day. Any insights on whether there is an upward or downward bias in the close and/or in the direction of its intraday price range can provide the trader with profit-

able opportunities to go long or short along the market bias and exit the trade on the same day.

## ACCUMULATION/DISTRIBUTION, CLOSE TO CLOSE

In March 2013, I introduced a simple, practical method I called the *cumulative EOD CCHL* price action. “CC” stood for close-to-close price and “HL” stood for high-to-low or high–low price range. The method, which showed marginal results, was meant to be a tool to forecast and help daytraders or active traders gain a different perspective on the short-term bias of the major indexes such as the Dow Jones Industrial Average (DJIA).

In this article, I will present a new method that shows much-improved results over the CCHL method. I call it the *ADCC*, where “AD” stands for accumulation/distribution and “CC” again stands for close-to-close price. Accumulation/distribution is a well-known momentum indicator developed by Marc Chaikin that measures supply & demand. I follow the

## TRADING TECHNIQUES

1	Table 1	S&P500 Index											
2	Date	Open	High	Low	Close	AD	Direction		Sign			Cumulative	
3		O	H	L	C	(w/o Vol)	AD	CC	AD	CC	AD	CC	
4													
5	5/6/14	1883.69	1883.69	1867.72	1867.72	-1.00	down	down	-1	-1	-1	-1	
6	5/7/14	1868.53	1878.83	1860.29	1878.21	0.93	up	up	1	1	1	1	
7	5/8/14	1877.39	1889.07	1870.05	1875.63	-0.41	down	down	-1	-1	-1	-1	
8	5/9/14	1875.27	1878.57	1867.10	1878.48	0.98	up	up	1	1	1	1	
9	5/12/14	1880.03	1897.13	1880.03	1896.65	0.94	down	up	-1	1	-1	2	
10	5/13/14	1896.75	1902.17	1896.06	1897.45	-0.55	down	up	-1	1	-2	3	
11	5/14/14	1897.13	1897.13	1885.77	1888.53	-0.51	up	down	1	-1	1	-1	
12	5/15/14	1888.16	1888.16	1862.36	1870.85	-0.34	up	down	1	-1	2	-2	
13	5/16/14	1871.19	1878.28	1864.82	1877.86	0.94	up	up	1	1	3	1	
14	5/19/14	1876.66	1886.00	1872.42	1885.08	0.86	down	up	-1	1	-1	2	
15	5/20/14	1884.88	1884.88	1868.14	1872.83	-0.44	down	down	-1	-1	-2	-1	
16	5/21/14	1873.34	1888.80	1873.34	1888.03	0.90	up	up	1	1	1	1	

NOTE: ONLY A PORTION OF THE ROWS ARE SHOWN HERE. FULL SPREADSHEET IS AVAILABLE AT WWW.TRADERS.COM IN THE ARTICLE CODE AREA.

**FIGURE 1: LABELING WITH BINARY NUMBERS.** When there is an up day from yesterday's AD value, AD is labeled as 1. When there is a down day from yesterday's AD value, AD is labeled as -1. The same exercise is applied to the CC.

basic and cumulative calculations used in the earlier CCHL methodology, but instead of using the HL range, I substitute the AD indicator without the volume component. In addition, I perform the analysis on the S&P 500 index.

This method is not a system or indicator per se but rather a short-term-oriented approach that can shed light on tomorrow's market bias based on the market's historical footprints. The method should also not be used solely as a standalone tool. It is best utilized in conjunction with other short-term indicators or tools as an add-on or a confirming one.

## COMPUTING THE ADCC

The first step is to label each trading day with a binary number or a combination of two numbers (see the table in Figure 1). The first number is designated for the AD and the second number is designated for the CC. AD is defined here as  $[(C-L)-(H-C)]/(H-L)$  without the volume component, where H is the high price of the day, L is the low price of the day, and C is the close of the day. CC is defined again as the close to close. When there is an up day from yesterday's AD value, AD is labeled as 1. When there is a down day from yesterday's AD value, AD is labeled as -1.

(see Figure 1, under the columns *direction* and *sign*). The same exercise is applied to the CC.

The next step is to add or accumulate these numbers to obtain the so-called cumulative binary numbers that will represent each trading day. The binary numbers increase or decrease, reflecting the short-term trend or price action that is occurring. Each time the trend changes, the direction or sign changes (see the last column of Figure 1, *cumulative AD & CC*). To reiterate, the first binary number and sign characterize the cumulative A/D direction. The second binary number and sign characterize the

1	Table 2	Actual		Predictive ADCC numbers																	
2	S&P500					1st Quadrant				2nd Quadrant				3rd Quadrant				4th Quadrant			
3																					
4	Date	AD	CC	AD	CC	# Occ	% Occ	AD	CC	# Occ	% Occ	AD	CC	# Occ	% Occ	AD	CC	# Occ	% Occ		
5																					
6	5/6/14	-1	-1	-1	-1	305	45	-1	2	172	26	2	2	169	25	2	-1	25	4		
7	5/7/14	1	1	1	1	318	51	-2	-2	139	22	1	-2	134	22	-2	1	31	5		
8	5/8/14	-1	-1	-1	-1	306	46	-1	2	172	26	2	2	169	25	2	-1	25	4		
9	5/9/14	1	1	1	1	319	51	-2	-2	139	22	1	-2	134	22	-2	1	31	5		
10	5/12/14	-1	2	-1	-1	307	46	-1	2	172	26	2	2	169	25	2	-1	25	4		
11	5/13/14	-2	3	-2	-1	102	46	1	3	75	34	-2	3	42	19	1	-1	4	2		
12	5/14/14	1	-1	1	4	21	50	-3	-1	13	31	1	-1	5	12	-3	4	3	7		
13	5/15/14	2	-2	-1	-2	18	46	2	1	14	36	2	-2	4	10	-1	1	3	8		
14	5/16/14	3	1	3	1	2	50	-1	1	1	25	3	-3	1	25						
15	5/19/14	-1	2	-1	-1	13	50	-1	2	9	35	4	2	4	15						
16	5/20/14	-2	-1	-2	-1	102	46	1	3	75	33	-2	3	43	19	1	-1	4	2		
17	5/21/14	1	1	1	1	103	52	-3	-2	47	24	1	-2	37	19	-3	1	11	6		
18	5/22/14	-1	2	-1	-1	307	46	-1	2	173	26	2	2	169	25	2	-1	25	4		
19	5/23/14	1	3	-2	-1	103	46	1	3	75	33	-2	3	43	19	1	-1	4	2		
20	5/27/14	2	4	-1	-1	29	38	-1	4	29	38	2	4	15	19	2	-1	4	5		
21	5/28/14	-1	-1	-1	-1	11	73	-1	5	3	20	3	5	1	7						
22	5/29/14	1	1	1	1	320	51	-2	-2	139	22	1	-2	134	21	-2	1	31	5		
23	5/30/14	-1	2	-1	-1	307	45	-1	2	174	26	2	2	169	25	2	-1	25	4		
24	6/2/14	-2	3	-2	-1	103	46	1	3	76	34	-2	3	43	19	1	-1	4	2		
25	6/3/14	-3	-1	1	4	21	49	-3	-1	13	30	1	-1	6	14	-3	4	3	7		
26	6/4/14	1	1	1	1	26	63	-4	-2	7	17	1	-2	6	15	-4	1	2	5		
27	6/5/14	2	2	-1	-1	307	45	-1	2	175	26	2	2	169	25	2	-1	25	4		
28	6/6/14	3	3	-1	-1	80	47	-1	3	63	37	3	3	21	12	3	-1	5	3		
29	6/9/14	-1	4	-1	-1	15	71	-1	4	5	24	4	-1	1	5						
30	6/10/14	1	-1	-2	-1	22	54	1	5	8	20	-2	5	6	15	1	-1	5	12		
31	6/11/14	-1	-2	-1	-2	18	45	2	1	14	35	2	-2	5	13	-1	1	3	8		

NOTE: ONLY A PORTION OF THE ROWS ARE SHOWN HERE. FULL SPREADSHEET IS AVAILABLE AT WWW.TRADERS.COM IN THE ARTICLE CODE AREA.

**FIGURE 2: PREDICTIVE ADCC NUMBERS.** By tabulating and arranging all possible four (or less) outcomes or quadrants in the order of highest percentage of occurrence, the highest two outcomes or quadrants will serve as the bias or predictor for tomorrow's trading day.

1	Table 3	Actual		Predictive CCHL numbers															
2	S&P500			1st Quadrant				2nd Quadrant				3rd Quadrant				4th Quadrant			
3																			
4	Date	CC	HL	CC	HL	# Occ	% Occ	CC	HL	# Occ	% Occ	CC	HL	# Occ	% Occ	CC	HL	# Occ	% Occ
5																			
6	5/6/14	-1	-1	2	-1	53	39	-1	-1	51	38	-1	3	20	15	2	3	11	8
7	5/7/14	1	1	1	1	113	38	-2	1	111	37	1	-2	51	17	-2	-2	25	8
8	5/8/14	-1	2	2	-1	99	34	-1	-1	80	28	-1	2	55	19	2	2	55	19
9	5/9/14	1	-1	1	-1	42	42	-2	-1	27	27	1	3	20	20	-2	3	11	11
10	5/12/14	2	1	-1	1	126	36	2	1	107	30	2	-2	63	18	-1	-2	58	16
11	5/13/14	3	-1	3	-1	65	41	-1	-1	52	33	-1	2	27	17	3	2	15	9
12	5/14/14	-1	1	-1	1	38	37	4	1	33	32	4	-2	21	20	-1	-2	11	11
13	5/15/14	-2	2	1	-1	134	36	-2	-1	85	23	1	2	84	22	-2	2	73	19
14	5/16/14	1	-1	1	-1	32	44	-3	-1	22	30	-3	3	11	15	1	3	8	11
15	5/19/14	2	1	-1	1	126	35	2	1	108	30	2	-2	63	18	-1	-2	58	16
16	5/20/14	-1	2	3	-1	66	41	-1	-1	52	33	-1	2	27	17	3	2	15	9
17	5/21/14	1	-1	1	-1	43	43	-2	-1	27	27	1	3	20	20	-2	3	11	11
18	5/22/14	2	-2	-1	1	126	35	2	1	109	31	2	-2	63	18	-1	-2	58	16
19	5/23/14	3	-3	3	1	24	38	-1	1	23	37	3	-3	8	13	-1	-3	8	13
20	5/27/14	4	1	-1	1	5	63	4	1	2	25	4	-4	1	13				
21	5/28/14	-1	-1	5	-1	19	40	-1	-1	16	33	-1	2	7	15	5	2	6	13
22	5/29/14	1	1	1	1	114	38	-2	1	111	37	1	-2	51	17	-2	-2	25	8
23	5/30/14	2	-1	2	-1	99	34	-1	-1	80	28	-1	2	56	19	2	2	55	19
24	6/2/14	3	1	-1	1	60	35	3	1	47	27	3	-2	39	23	-1	-2	27	16
25	6/3/14	-1	-1	4	-1	32	42	-1	-1	24	31	4	2	11	14	-1	2	10	13
26	6/4/14	1	1	1	1	115	38	-2	1	111	37	1	-2	51	17	-2	-2	25	8
27	6/5/14	2	2	2	-1	100	34	-1	-1	80	27	-1	2	56	19	2	2	55	19
28	6/6/14	3	-1	3	-1	31	56	-1	-1	22	40	-1	3	1	2	3	3	1	2
29	6/9/14	4	1	-1	1	39	38	4	1	33	32	4	-2	21	20	-1	-2	11	11
30	6/10/14	-1	-1	5	-1	19	39	-1	-1	17	35	-1	2	7	14	5	2	6	12
31	6/11/14	-2	1	1	1	116	38	-2	1	111	37	1	-2	51	17	-2	-2	25	8
32	6/12/14	2	2	1	1	58	34	2	1	44	25	2	2	28	21	1	2	25	16

NOTE: ONLY A PORTION OF THE ROWS ARE SHOWN HERE. FULL SPREADSHEET IS AVAILABLE AT WWW.TRADERS.COM IN THE ARTICLE CODE AREA

NOTE: ONLY A PORTION OF THE ROWS ARE SHOWN HERE. FULL SPREADSHEET IS AVAILABLE AT [WWW.TRADERS.COM](http://WWW.TRADERS.COM) IN THE ARTICLE CODE AREA.

**FIGURE 3: PREDICTIVE CCHL NUMBERS.** The boxes marked in gray represent the actual daily CC and HL. When two quadrants have equal probability or bias, the boxes are marked in orange. These values are omitted from the analysis as are the rows that are blank.

cumulative close direction. This cumulative binary coding will facilitate further data calculations.

Now that each trading day is uniquely coded into a cumulative binary number, I look back at historical EOD data and determine all possible outcomes of these binary numbers for tomorrow's trading day and compute how often they occurred, that is, I compute their distribution or probability of occurrence (see the table in Figure 2). Since there are only

two variables (AD and CC) with only two possibilities (up or down), there will always be a total of four possible outcomes (or less) for each trading day. The task of the next step is to determine what these four binary numbers that might occur tomorrow are and how often they occurred over an extended period of time.


All calculations to determine the historical distributions were done in a Microsoft Excel spreadsheet. Anyone familiar with Excel can write the formulas and construct the spreadsheet. All you have to do daily is obtain the EOD index data (O,H,L,C) from any online financial website, plug them into the spreadsheet, and perform tasks such as copying, pasting, sorting, and tabulating data.

By tabulating and arranging all possible four (or less) outcomes or quadrants in the order of highest percentage of occurrence as shown in Figure 2, the highest two outcomes or quadrants will serve as the bias or predictor for tomorrow's trading day. You should trade in the direction of the two highest possible percentages of occurrences in conjunction with other preferred short-term indicators. No positions should be taken when the bias is unclear or in doubt.

Method	1st Quadrant	2nd Quadrant	3rd Quadrant	4th Quadrant	Total # of Days
CCHL	99	74	44	32	250
ADCC	133	67	46	13	257
Data As %					
CCHL	39.60	29.60	17.60	12.80	100
ADCC	51.75	26.07	17.90	5.06	100
Comparative analysis on the S&P 500 index from 5/6/2014 to 5/29/2015 Historical data dates back to 1/3/2000					

**FIGURE 4: COMPARING THE TWO METHODS.** This analysis implies that the daily accumulation/distribution is more predictive than the daily price range (H-L) when combined with the close-to-close price.





## The daily accumulation/distribution is more predictive than the daily price range when combined with the close-to-close price.

### COMPARING CCHL AND ADCC

Figure 2 shows how well the ADCC method worked on the S&P 500 index (as an example) over a period of about one year from May 16, 2014 to May 29, 2015. [Editor's note: While only portions of the spreadsheet are shown in Figures 1, 2, & 3 due to space, the spreadsheet in its entirety is available as an Excel file at [www.traders.com](http://www.traders.com) in the Article Code area as well as at [traders.com/files/ADCC-Tables.xlsx](http://traders.com/files/ADCC-Tables.xlsx).] For comparison, the table in Figure 3 shows the results on the same index over the same period of time but with the CCHL method.

The boxes marked in gray color represent the actual daily AD and CC in Figure 2, and CC and HL in Figure 3. When two quadrants have equal probability or bias, the boxes are marked in orange color. These do not count and are omitted from the analysis. Omitted also are some rows that are blank where there were no precedent occurrences to look back historically. Equal- and zero-probability days were excluded in the counting because they offered no bias or prediction for whether they will be correct or incorrect calls for the next day.

The table in Figure 4 shows the final comparison between the two methods on the S&P 500 index. The first two rows show the number of correct calls in each of the quadrants from May 6, 2014 to May 29, 2015. The lower two rows in the table show the data in percentage terms. Historical data on the index dates back to January 3, 2000. It can be seen from Figure 4 that the ADCC method shows better results in the two highest quadrants compared to the CCHL method. More than a 10% improvement can be seen in the first quadrant alone and about 7–8% when the first and second quadrants are combined. It can also be seen that the ADCC method predicted far less occurrences in the fourth quadrant. This analysis implies that

the daily accumulation/distribution is more predictive than the daily price range (H-L) when combined with the close-to-close price. Short-term traders who trade other indexes can further expand on this concept with their own ideas to fit their own methodology and needs.

### WHERE'S THE BIAS?

In this article, I have presented an improved, simple, and practical method for short-term active traders or daytraders. The method is based on the historical price actions of the end-of-day cumulative accumulation/distribution and closing prices of the S&P 500 index as an example. The method provides a slight edge and is much improved over the CCHL method for suggesting an upward or downward bias in the direction of the close. It is not considered a system or an indicator and should not be utilized as a standalone tool but rather in conjunction with other short-term indicators.

*Adel Weng holds an MS and PhD in macromolecular science (plastics) from Case Western Reserve University, Ohio. He has invested in stocks and mutual funds since 1995 and has actively traded the emini Dow and S&P 500 futures for three years. He may be reached via email at [aweng718@gmail.com](mailto:aweng718@gmail.com).*

*The spreadsheet discussed in this article is available at the Subscriber Area at our website, [www.Traders.com](http://www.Traders.com), in the **Article Code** area, as well as at <http://traders.com/files/ADCC-Tables.xlsx>.*

### FURTHER READING

Achelis, Steven [2013]. *Technical Analysis From A To Z*, 2d. ed, McGraw-Hill.

Weng, Adel [2013]. "Cumulative CCHL Analysis," *Active Trader*, Volume 14: March.

‡Excel (Microsoft Corp.)



Find similar articles online at [Traders.com](http://Traders.com)

