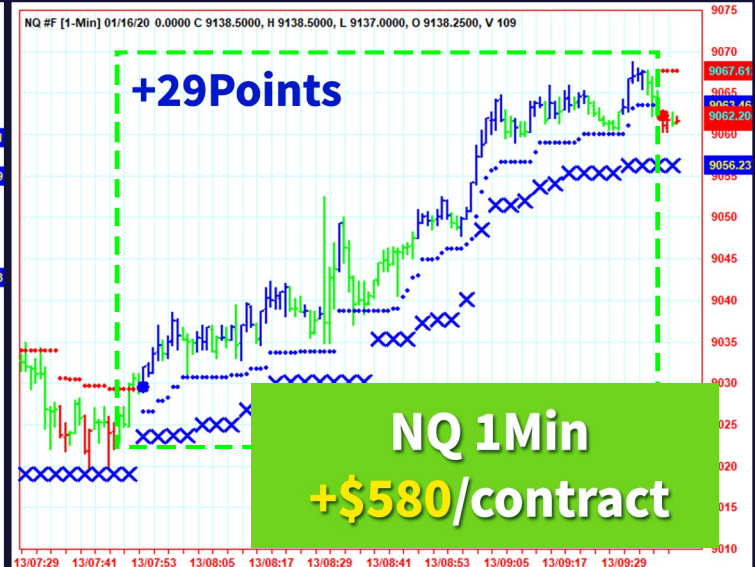
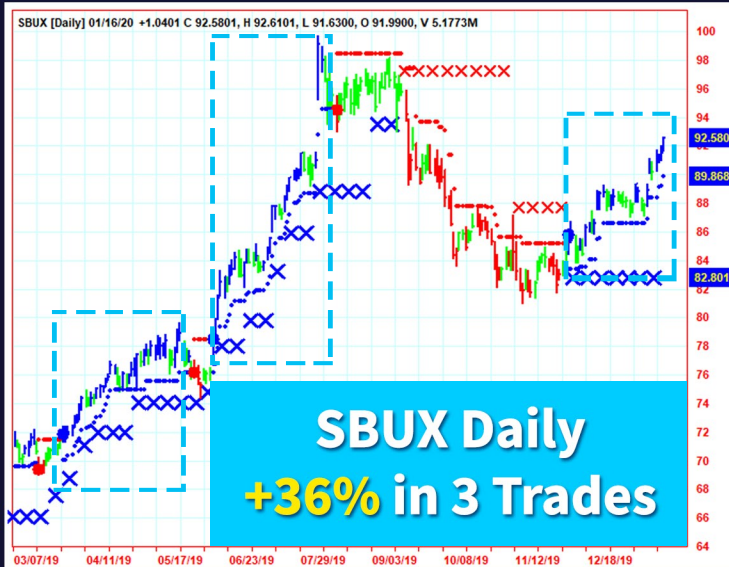


Powerful Signals for Stocks & Commodities

Long Term

&

Short Term



Works with stocks, commodities, futures, options, FOREX, bonds for intra-day or position trading



Triple Confirmed **Buy/Sell Signals**



Built-in **Dynamic Risk Control Signals**



Traders Rave Over AbleTrend

1997-2019 Award Winning Trading Systems for Stocks, Futures and Options



ABLESYS SINCE 1994

ABLETREND 7.0

COLLECTED BY



Trustpilot



- “I have used it for 10+ years and have tried many other trading software systems. This is by far the very best system that can adjust to any market condition.”-Joe S
- “I have been using AbleTrend for 13 years! Primarily for day trading stocks...I could not do without it!” -Ricardo DaSilva
- “I have been using Ablesys since 2009. In my humble opinion, Ablesys offers the best trend software available on the market today.”-Frank

- “I never make a trade without checking with Ablesys. The program is my important guiding light and has been for over 10 years. I highly recommend this program.” -Harvey Saff
- “Have been using Able Trend for 20 years and it is just as effective and accurate as it was in 1999.” -Dan Sayyer
- “I've used AbleTrend for many years, and I never buy a stock without checking the signals first.”-Sam

Test-drive it to See All the Signals!

www.ablesys.com/SCM

Risk FREE AbleTrend 30-Day Trial
\$40 Discount code: SCMF20

©2020 Ablesys Corp. • 8407 Central Ave, Ste 1882, Newark, CA, 94560



1-888-ASC-1688



sales@ablesys.com

THESE RESULTS ARE BASED ON SIMULATED OR HYPOTHETICAL PERFORMANCE RESULTS THAT HAVE CERTAIN INHERENT LIMITATIONS. UNLIKE THE RESULTS SHOWN IN AN ACTUAL PERFORMANCE RECORD, THESE RESULTS DO NOT REPRESENT ACTUAL TRADING. ALSO, BECAUSE THESE TRADES HAVE NOT ACTUALLY BEEN EXECUTED, THESE RESULTS MAY HAVE UNDER-OR OVER-COMPENSATED FOR THE IMPACT, IF ANY, OF CERTAIN MARKET FACTORS, SUCH AS LACK OF LIQUIDITY. SIMULATED OR HYPOTHETICAL TRADING PROGRAMS IN GENERAL ARE ALSO SUBJECT TO THE FACT THAT THEY ARE DESIGNED WITH THE BENEFIT OF HINDSIGHT. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THESE BEING SHOWN. THE TESTIMONIAL MAY NOT BE REPRESENTATIVE OF THE EXPERIENCE OF OTHER CLIENTS AND THE TESTIMONIAL IS NO GUARANTEE OF FUTURE PERFORMANCE OR SUCCESS. TECHNICAL ANALYSIS OF STOCKS & COMMODITIES LOGO AND AWARD ARE TRADEMARKS OF TECHNICAL ANALYSIS, INC.

Popular Bond Scanners

Corporate High Yield

Corporate US 2-3%

Top Munis

Munis Investment Grade

US CDs High Yield

2030 US Treasuries

Bond Scanner

Corporate Bonds

US CDs

US Treasuries

US Muni Bonds

Non-US Sovereign Bonds

Maturity Date

From

To

MM/DD/YYYY

MM/DD/YYYY

Yield

Worst

Maximum

12

%

Industries

- ☒ Energy
- ☒ Basic Materials
- ☒ Industrial
- ☒ Consumer Cyclical
- ☒ Consumer Non-Cyclical
- ☒ Financial
- ☒ Technology
- ☒ Telecommunications Services
- ☐ Utilities

+ All

Take the Bond Challenge!

Use the IBKR **Bond Scanner** to compare
available yields against those of your broker.



Interactive Brokers **Rated #1**
Best Online Broker 2019 by Barron's*

Start Trading Today!

ibkr.com/comparechallenge

Member - NYSE, FINRA, SIPC - Supporting documentation for any claims and statistical information will be provided upon request. *Interactive Brokers rated #1, Best Online Broker according to Barron's Best Online Brokers Survey of 2019: February 25, 2019. For more information see, ibkr.com/info
Barron's is a registered trademark of Dow Jones & Co. Inc.

03-IB20-1280CH1278

NEW TECHNIQUES

First MOMA. Then VOMOMA. And Now...

Weight + Volume + Move-Adjusted Moving Average: It's WEVOMO!

Moving averages: I use 'em, you use 'em, we all use 'em, but can they really tell you anything about the future direction of a time series? In this article, the third of a series, we look at minimizing the lag even more using the weighted move- and volume-adjusted moving average.

by **Stephan Bisse**

M

oving averages merely give you a view of where a time series has been in the past. So how can it be used as a predictor? The only way is by adding more information

into the calculation. But if you do this you have to make sure it is a leading indicator for the time series in question. In other words, changes in the additional information must be correlated to future changes in the time series.

In my February 2005 article, "Visiting MOMA," I adjusted a simple moving average (SMA) by taking each datapoint in the lookback period and weighting it according to the absolute magnitude of the move that preceded it relative to the sum of all of the absolutes in the lookback period. I christened this new moving average *MOMA*.

In my March 2005 article, "Adding Volume To The Move-Adjusted Moving Average," I further adjusted MOMA by the relative magnitude of the volume of each datapoint in the lookback period to create a double-adjusted moving average, which I christened *VOMOMA*. The idea behind MOMA is that a strong move in a given direction is a harbinger of the future direction of the market, and therefore weighting an average by the magnitude of the moves between datapoints can produce timelier signals than a standard SMA. The additional step to VOMOMA is based on the logic that large moves accompanied by heavy volume are more significant than those accom-

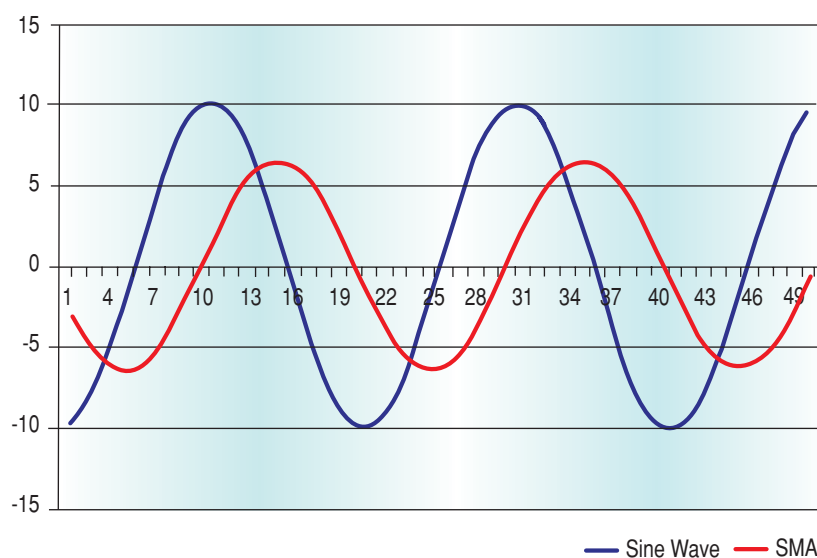


FIGURE 1: THE LAG IN MOVING AVERAGES. Here you see a sine wave with a frequency of 20 vs. a 10-day simple moving average (SMA). Note that there is a five-day lag in the SMA.

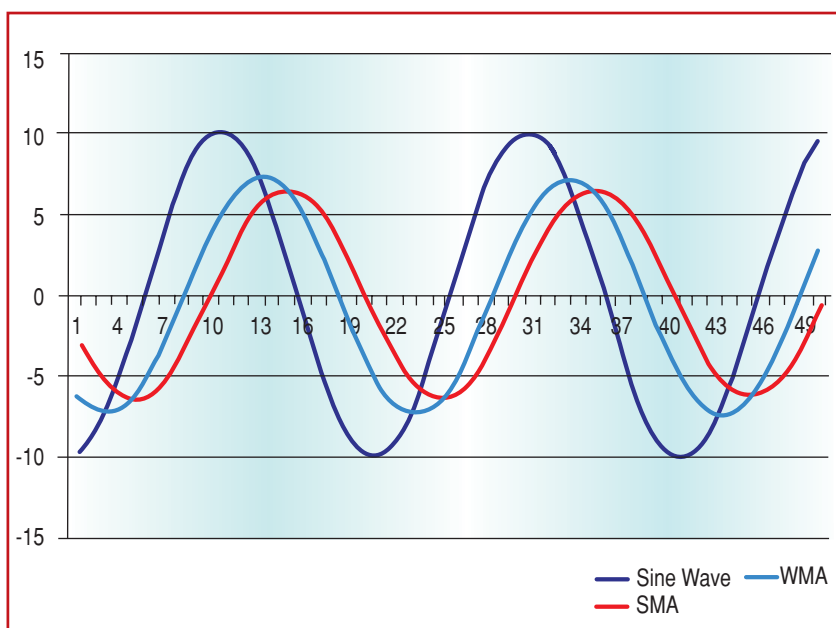


FIGURE 2: THE WEIGHTED MOVING AVERAGE. Here you see the 10-period weighted moving average (WMA) added to the sine wave and SMA. The lag in the WMA is half that of the SMA.

panied by light volume. Therefore, a moving average adjusted by both volume and size of move can capture these additional nuances.

DEALING WITH LAG

Although MOMA and VOMOMA are interesting additions to the traders' toolbox, they suffer from lag† the same way that any standard moving average does. In an SMA, the lag is half of the lookback period—for example, a 10-period SMA will have a lag of five periods. Figure 1 shows a sine wave with a frequency of 20 with a 10-period SMA. Note how the 10-period SMA lags the sine wave by five datapoints. One easy way of dealing with lag is to weight the most recent datapoints more heavily than the older ones, like in a classic weighted moving average (WMA)†. For example, in a 10-period WMA, the most recent datapoint is weighted 10 times more heavily than the oldest one, with all the points in between getting weighted by their order of appearance.

Figure 2 shows the same sine wave and 10-period SMA with the addition of a 10-period WMA. Note how the lag of the WMA is roughly half of the lag of the SMA. So to deal with lag in VOMOMA, the final adjustment will be to create a WMA and average it into VOMOMA to reduce its lag and thus create a more responsive indicator to reflect all of its components. I call this indicator WEVOMO.

FROM MOMA TO WEVOMO

First, let's rehash the calculations required to arrive at VOMOMA via MOMA and VOMA.

To create MOMA:

- 1 Sum up all of the absolute changes between the closes in the lookback period (note that for the first close, this is the absolute difference between it and the previous close, which is outside the lookback period).
- 2 Multiply each closing value by the absolute change from the previous bar's close, divided by the sum of the absolute changes. This produces the series of closes adjusted by the relative absolute move that preceded it as a percentage of the total absolute moves in the lookback period. The MOMA is the sum of all of these move-adjusted closes.

For VOMA, repeat these steps, adjusting each datapoint by the volume as a percentage of the sum of all the volumes of the datapoints in the lookback period. This creates a simple volume-adjusted moving average (VOMA). Note that this version of a volume-adjusted moving average is different from the VAMA that was created by Richard Arms

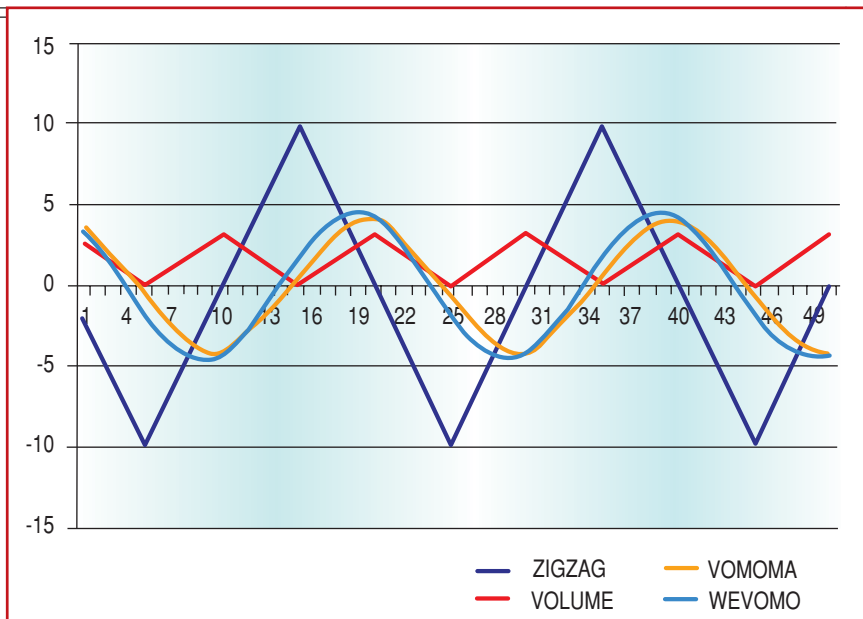


FIGURE 3: WEVOMO AND LAG. By weighting the VOMOMA, the lag is reduced even further, as can be seen by the light blue line.

Jr., as mentioned previously.

The VOMOMA is simply MOMA plus VOMA divided by 2. To create the third component, simply multiply each datapoint in the lookback period by the order of its occurrence, starting from the oldest to the newest, to create a standard WMA. For example, for a 10-period WMA, multiply the first or oldest component by 1, the second by 2, all the way to the most recent datapoint, which is multiplied by 10. Add up all of these products and divide the sum by 55, which is the sum of all the multipliers or weighting factors. To arrive at WEVOMO, simply add up MOMA, VOMA, and WMA, and divide the total by 3. (See sidebar, "WEVOMO.")

Why weight VOMOMA? The advantages of doing this can be seen in the following examples. Figure 3 shows a dark blue zigzag data line and a red volume line. The volume lags the zigzag line by half of a cycle length, which means that every time the zigzag line peaks or troughs, volume is at its low, while every time the zigzag line is crossing the zero line, volume peaks. In this idealized example of a range-trading market, where volume peters out as either extreme of the range is reached, VOMOMA does a superior job of smoothing out the data when compared to MOMA or SMA. Note how WEVOMO, the light-blue line, peaks and troughs a few datapoints earlier than VOMOMA, reflecting the responsiveness gained from adding WMA into the mix.

Figure 4 shows the behavior of VOMOMA and WEVOMO when both the zigzag line and the volume are in sync—that is, they peak and trough at the same time. This idealized behavior is based on the notion that when a range-trading market is poised to break out, its volume will increase as it approaches the top or bottom of its range, not decrease. Hence, both VOMOMA and WEVOMO will have greater amplitude than in the example from Figure 3, where the range-bound market is expected to persist. The amplitude of VOMOMA is greater, but so is the amplitude of WEVOMO, which again shows better responsiveness by a few periods.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2	Date	Open	High	low	Close	Volume							
3	19780111	1.119299	1.133699	1.116699	1.132699	1234							
4	19780112	1.127099	1.133299	1.095699	1.115099	1235							
5	19780113	1.114699	1.127699	1.113299	1.123299	1236	Abs. sum	4 Period	Sum of	4 Period	4 Period	4 Period	4 Period
6	19780116	1.122099	1.122099	1.112699	1.119699	1237	changes	MOMA	volume	VOMA	VOMOMA	WMA	WEVOMO
7	19780117	1.111699	1.118099	1.105699	1.115099	1238	0.034	1.117564	4946	1.118298788	1.117931	1.118119	1.117994
8	19780118	1.106699	1.113699	1.105699	1.112699	1239	0.0188	1.11925	4950	1.117695461	1.118473	1.115879	1.117608
9	19780119	1.117699	1.122699	1.115699	1.121699	1240	0.0196	1.118681	4954	1.117299531	1.11799	1.117479	1.11782
10	19780120	1.123299	1.126699	1.117699	1.126699	1241	0.021	1.120415	4958	1.119053615	1.119735	1.121239	1.120236
11	19780123	1.126699	1.132699	1.126699	1.132099	1242	0.0218	1.124431	4962	1.123305558	1.123868	1.126459	1.124732
12	19780124	1.134699	1.135699	1.130099	1.135099	1243	0.0224	1.127117	4966	1.128903795	1.12801	1.131179	1.129067
13	19780125	1.137699	1.143299	1.136699	1.141699	1244	0.02	1.134367	4970	1.133904033	1.134136	1.136299	1.134857
14	19780126	1.137699	1.141699	1.134299	1.134699	1245	0.022	1.136216	4974	1.135900621	1.136058	1.136619	1.136245
15	19780127	1.138699	1.140699	1.129699	1.134699	1246	0.0166	1.137555	4978	1.136548336	1.137051	1.136139	1.136747
16	19780130	1.134699	1.143299	1.126699	1.128699	1247	0.0196	1.13522	4982	1.134945247	1.135082	1.132999	1.134388
17	19780131	1.138699	1.140699	1.134299	1.138699	1248	0.023	1.134873	4986	1.134199755	1.134536	1.134499	1.134524
18	19780201	1.135099	1.137699	1.134299	1.137699	1249	0.017	1.135111	4990	1.134951065	1.135031	1.135899	1.13532
19	19780202	1.137699	1.138699	1.135699	1.137699	1250	0.017	1.135111	4994	1.135701772	1.135406	1.136999	1.135937
20	19780203	1.126699	1.129699	1.121699	1.129299	1251	0.0194	1.134578	4998	1.135846341	1.135212	1.134439	1.134954
21	19780206	1.120099	1.124299	1.116699	1.121699	1252	0.017	1.126396	5002	1.131593533	1.128995	1.128779	1.128923
22	19780207	1.122099	1.122099	1.116699	1.117099	1253	0.0206	1.123771	5006	1.126442245	1.125107	1.122979	1.124397
23	19780208	1.108699	1.123299	1.105699	1.114699	1254	0.023	1.122824	5010	1.120694338	1.121759	1.118279	1.120599
24	19780209	1.117099	1.121299	1.116699	1.117099	1255	0.017	1.118817	5014	1.11764755	1.118232	1.116839	1.117768
25	19780210	1.121699	1.123699	1.119699	1.123699	1256	0.016	1.119462	5018	1.11815137	1.118807	1.119259	1.118957
26	19780213	1.126699	1.128699	1.124699	1.125699	1257	0.0134	1.121204	5022	1.120303102	1.120753	1.122279	1.121262
27	19780214	1.126299	1.127099	1.118699	1.120099	1258	0.0166	1.121771	5026	1.121650275	1.121711	1.122199	1.121874
28	19780215	1.118699	1.121099	1.115699	1.118699	1259	0.0156	1.122215	5030	1.122047142	1.122131	1.121019	1.12176
29	19780216	1.120099	1.135099	1.120099	1.134099	1260	0.0244	1.129314	5034	1.124651575	1.126983	1.125839	1.126602
30	19780217	1.132099	1.134099	1.129499	1.133699	1261	0.0228	1.129708	5038	1.126654797	1.128181	1.129459	1.128607
31	19780221	1.134099	1.140099	1.129499	1.138099	1262	0.0216	1.133909	5042	1.131154958	1.132532	1.134039	1.133034
32	19780222	1.132099	1.137499	1.128099	1.132099	1263	0.0262	1.134307	5046	1.134499059	1.134403	1.134419	1.134408
33	19780223	1.133099	1.145099	1.133099	1.143699	1264	0.0224	1.139313	5050	1.136901572	1.138108	1.138099	1.138105

SIDEBAR FIGURE 1: EXCEL SPREADSHEET TO CALCULATE WEVOMO

WEVOMO

Simple moving averages (SMA) are great for showing the past price action of a market by filtering out noise and showing the underlying trend. However, the only way a moving average can indicate the future market direction is if additional, leading information is included in its calculation. The idea behind WEVOMO is that the magnitude of moves between datapoints, and the volume of each datapoint are both leading indicators in the future direction of a market, and that the more recent datapoints are more important than the older ones.

To arrive at WEVOMO, the first step is to calculate MOMA. Adjust each datapoint in the lookback period by the absolute move that preceded it as a percentage of the sum of all the absolute moves in the lookback period. The formula for the absolute sums of the changes between the datapoints for a four-period lookback period is given in cell G7:

$$=ABS(E7-E6)+ABS(E6-E5)+ABS(E5-E4)+ABS(E4-E3)$$

Then take the absolute value of the difference between datapoints and divide this by the sum above to get the percentage weight of that datapoint in MOMA. To arrive at MOMA, simply multiply each datapoint by its percentage weight and add the products together. This calculation is shown in cell H7:

$$=(E7*(ABS(E7-E6)/G7))+.....(E4*(ABS(E4-E3)/G7))$$

In the next column, adjust each datapoint by its volume as a percentage of the sum of all the volumes in the lookback period. An example is shown in cell I7:

$$=SUM(F4:F7)$$

Then take the volume of each datapoint and divide it by the sum given to get the percentage weight of that datapoint in VOMA. To calculate VOMA, simply multiply each datapoint by its percentage weight and add the products together. This calculation is shown in cell J7:

$$=(E7*(F7/I7))+(E6*(F6/I7))+(E5*(F5/I7))+(E4*(F4/I7))$$

Add MOMA to VOMA and divide by 2 to arrive at VOMOMA. This is shown in cell K7:

$$=(J7+H7)/2$$

Calculate a weighted moving average (WMA) by taking each datapoint and multiplying it by its order of appearance, from the oldest to the most recent. For example, in a four-period WMA, the first and oldest datapoint is multiplied by 1, the second to last by 2, all the way to most recent datapoint, which is multiplied by 4. These products are then added together and the sum divided by the sum of the factors or multipliers used to adjust the datapoints, in this case 10 (1+2+3+4). This is shown in cell L7:

$$=((E7*4)+(E6*3)+(E5*2)+(E4*1))/(4+3+2+1)$$

Finally, to arrive at WEVOMO, simply add together MOMA, VOMA, and WMA and divide the sum by 3, as shown in cell M7:

$$=(L7+J7+H7)/3$$

An Excel worksheet with the formula for a 10-period and 20-period WEVOMO can be downloaded free of charge from keyreversal.com.

—SB

IN CLOSING

Moving averages are great for filtering out the noise from a time series and showing its general trend. Without additional information with some predictive power, however, moving averages cannot say anything about the future direction of the time series. In previous articles, the calculation of a SMA was first adjusted using the absolute move that preceded each datapoint as a percentage of the sum of all the absolute moves that preceded the datapoints in the lookback period. If the premise is correct that large moves in a given direction are harbingers of a new trend in the same direction, then this move-adjusted moving average, or MOMA, will be a superior indicator of future market direction when compared to a simple moving average.

Second, MOMA was further adjusted by the volume of each datapoint to add more nuance to the indicator to create VOMOMA, which distinguishes between large moves in a given direction accompanied by increased volume from those where volume decreases, appropriately weighting the former more heavily than the latter. Finally, to deal with the lag inherent in any moving average, VOMOMA was weighted to give more importance to recent data compared to older datapoints to improve its responsiveness. This means that the most recent datapoints with the largest moves on the heaviest volume shout the loudest, while the oldest datapoints with the smallest moves on low volume barely register. Keeping that in mind, happy trading!

Stephan Bisse is a principal of Multiverse Capital and Keyreversal.com, a website dedicated to novel technical indicators and systems. He has an MBA from the University of Oxford. For seven years, he was an executive director of Goldman, Sachs & Co. in London in the financial futures and

options division where among other things he was responsible for the daily technical analysis of the European fixed income futures markets.

SUGGESTED READING

Arms, Richard W., Jr. [1990]. "Volume-Adjusted Moving Averages," *Technical Analysis of STOCKS & COMMODITIES*, Volume 8: March.

Bisse, Stephan [2005]. "Visiting MOMA," *Technical Analysis of STOCKS & COMMODITIES*, Volume 23: February.

_____. [2005]. "Adding Volume To The Move-Adjusted Moving Average," *Technical Analysis of STOCKS & COMMODITIES*, Volume 23: March.

Chande, Tushar S. [1992] "Adapting Moving Averages To Market Volatility." *Technical Analysis of STOCKS & COMMODITIES*, Volume 10: March.

†See Traders' Glossary for definition

S&C

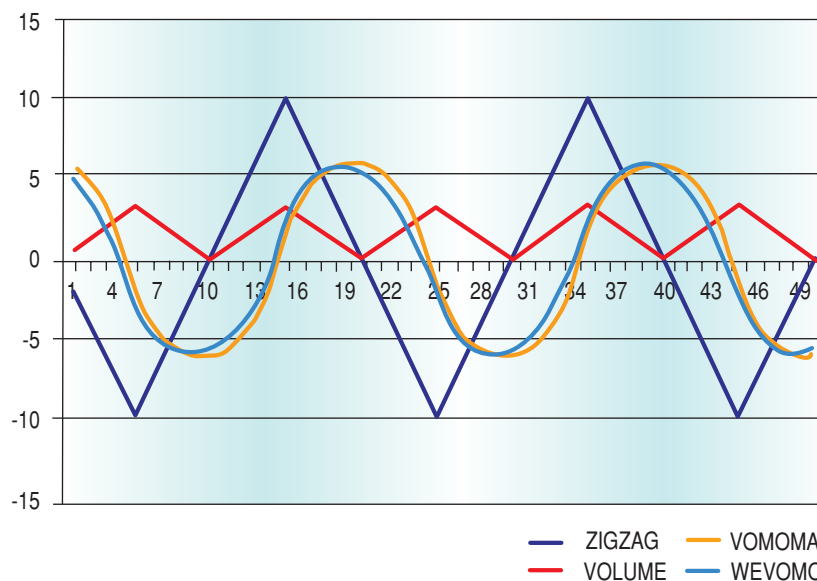


FIGURE 4: VOMOMA VS. WEVOMO. Assuming that volume will increase when prices approach the top and bottom of a trading range before a breakout, the amplitude of VOMOMA and WEVOMO will increase. Again, the WEVOMO is more responsive than VOMOMA.



Traders take many paths to reach their destination.

Can your platform get you there?



Search apps and services to personalize the
NinjaTrader platform to meet your requirements.
Indicators, automated strategies, free tools & more.

Explore now at ninjatraderecosystem.com

Futures, foreign currency and options trading contains substantial risk and is not for every investor. Only risk capital should be used for trading and only those with sufficient risk capital should consider trading.



Because you
can never have
too many
PowerTools

 **MetaStock17 is Here**
Featuring the **NEW OptionScope™**
and **QuoteCenter™** PowerTools

Discover the latest features at metastock.com/whats-new

SUBSCRIBE OR RENEW TODAY!

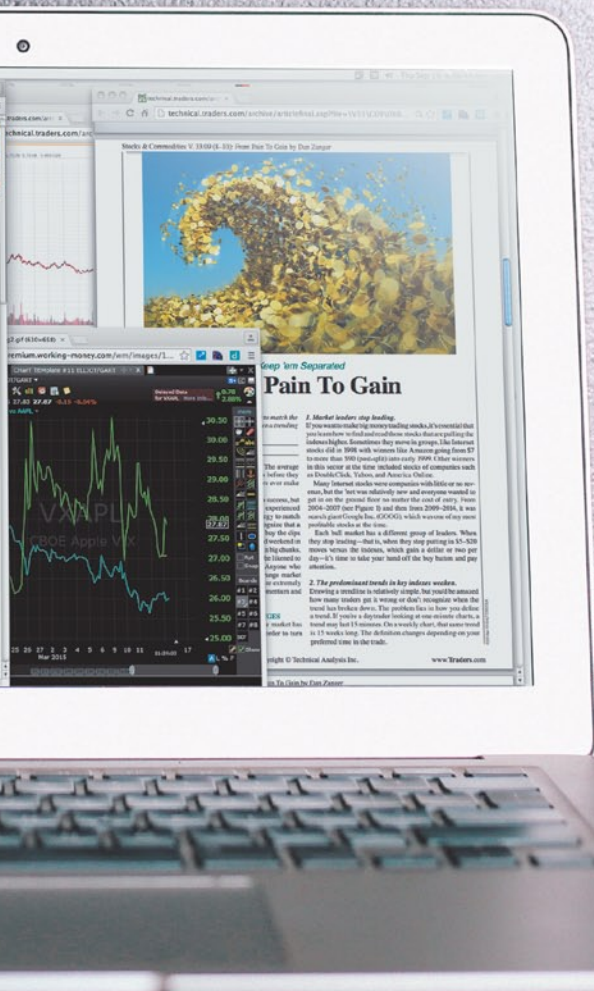
Every Stocks & Commodities subscription (regular and digital) includes:

- Full access to our Digital Edition
The complete magazine as a PDF you can download.
- Full access to our Digital Archives
That's 35 years' worth of content!
- Complete access to WorkingMoney.com
The information you need to invest smartly and successfully.
- Access to Traders.com Advantage
Insights, tips and techniques that can help you trade smarter.

1 year **\$89⁹⁹**

2 years **\$149⁹⁹**

3 years **\$199⁹⁹**



PROFESSIONAL TRADERS' STARTER KIT

A 5-year subscription to S&C magazine that includes everything above PLUS a free* book, *Charting The Stock Market: The Wyckoff Method*, all for a price that saves you \$150 off the year-by-year price! *Shipping & handling charges apply for foreign orders.

5 years **\$299⁹⁹**

That's around \$5 a month!



Visit **www.Traders.com** to find out more!