Identifying Trends With Volume Analysis

Here's a new twist on volume analysis, with a volume-based indicator for identifying meaningful trends.

by Stephen J. Klinger, CMT
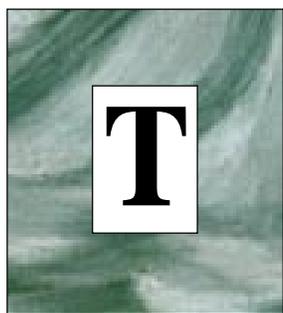
Technicians recognize the importance of volume analysis and its application to price movement as requisite to any serious examination of stocks and market averages. While price is the most important dimension of market analysis, how prices move is a function of the intensity of volume that produced it. The true measure of durability behind price movement is most readily available through volume data. Since volume is a proxy for money flow, volume analysis can expose the internal dynamics — the strengths and weaknesses — of price action.

Frequently, volume divergences exist beneath the cover of price action and provide the only evidence of an impending reversal. Moreover, since volume is thought to precede price, its usefulness as a leading indicator of price strength or weakness can result in a more accurate assessment of price action. Finally, by converting volume statistics into an effective timing model, technicians would be better able to gauge the validity of a given price movement.

USING VOLUME

For years, technicians have used volume as a confirming indicator of price movement. Rising volume is believed to accompany an uptrend, thus confirming the trend. Conversely, a price correction generally occurs on declining volume, often capitulating on an intense but short-lived liquidation. When volume deviates from the norm, price action should be called into question. Although volume is subject to distortions such as option expirations and program trading, its effectiveness as a barometer for stocks and market averages has been widely accepted by market analysts.

While traditional approaches to volume analysis, approaches such as Joseph Granville's on-balance volume and, more recently, Marc Chaikin's Chaikin oscillator, do an excellent job of converting raw volume data into useful volume models, short-term tops and bottoms still go undetected. The Kvo was created to provide traders with a volume indicator sensitive enough to consistently signal trading tops and bottoms by accurately reflecting the flow of money into and out of a security.

RATIONALE

Stocks and market averages advance and decline in patterns that deceive most investors. A stock can be under accumulation while closing down and in distribution while closing up. Although this occurs infrequently, it can be quite common in many of the price patterns that occur during a complete price cycle. Moreover, this may explain prices making higher highs and higher lows, yet closing down. Recognizing that this can occur makes its inclusion into volume analysis requisite to accurately assess price action. By redefining accumulation/distribution this way, the Klinger volume oscillator (Kvo) represents a broad departure from traditional definitions of volume accumulation. The Kvo is based on the following tenets:

1 While a price range is a measure of movement, volume is the impetus behind the movement. Therefore, the sum of the daily high, low and close defines the trend. A stock is under accumulation when the sum is greater than the previous day's total, and distribution occurs when the sum is less than the previous day's total. When equality occurs, the existing trend is maintained. To determine whether a stock is being accumulated or sold, the Kvo utilizes trend data versus closing price data or the percentage relationship between the close and its midpoint.

2 Volume produces continuous intraday changes in price, reflecting buying and selling pressure. Where existing indicators focus on one side of the volume equation, the Kvo quantifies the difference between the number of shares being accumulated and distributed each day in a security. This is referred to as the *volume force*. The Kvo is based on the theory that the volume force is the true measure of volume fueling prices toward higher or lower levels and can therefore improve the reliability of buy and sell signals. Since price and volume normally rise and fall together, a vigorous and rising volume force should accompany an uptrend and contract in a downtrend, followed by a rising volume force, reflecting some accumulation before a trading bottom develops.

3 By converting the volume force into an oscillator representing the difference between a 34-day and 55-day exponential moving average (EMA) with a 13-day trigger, the technician can track the force of volume into and out of a
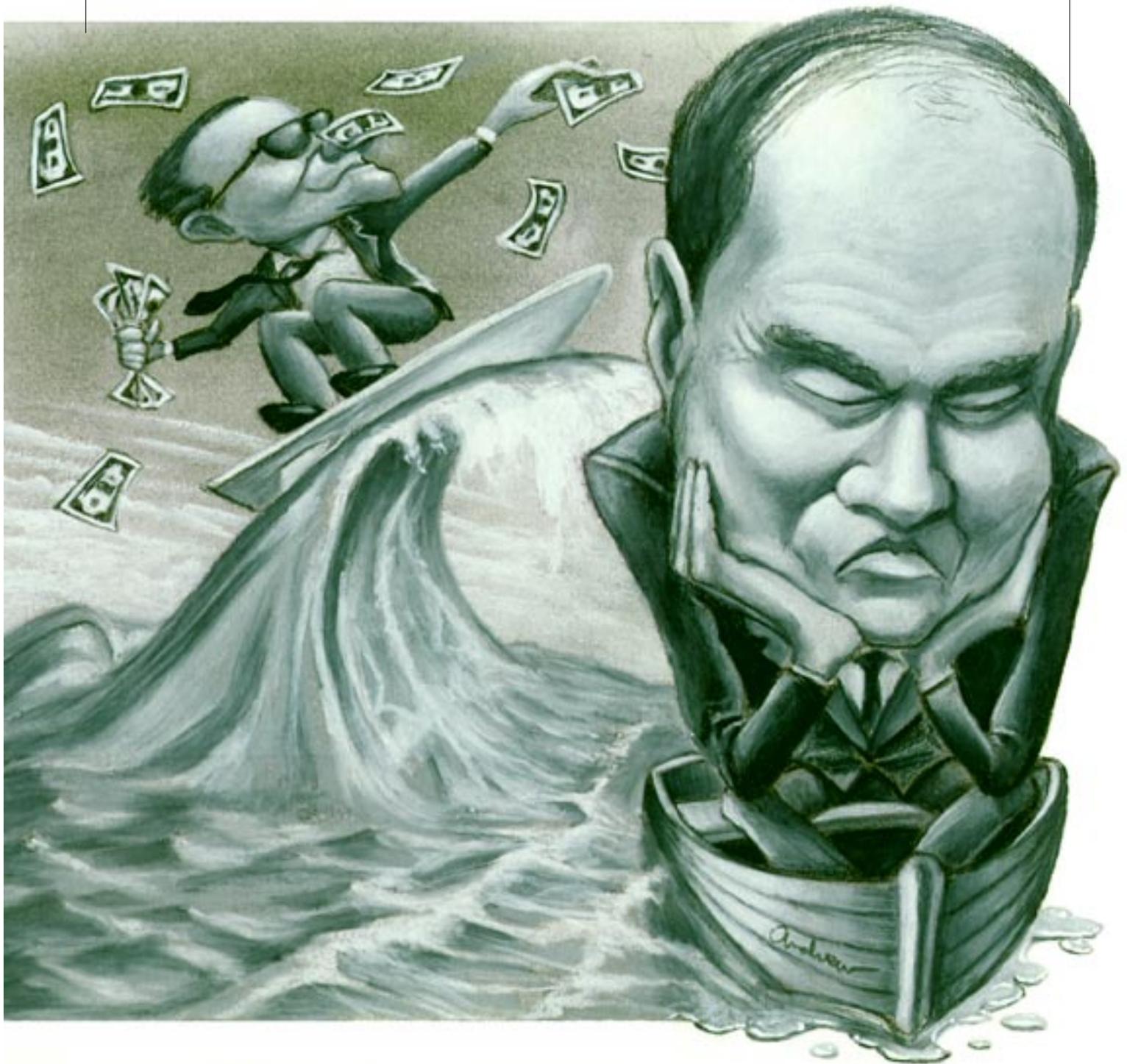
security. Comparing this force to price action can help time buy and sell decisions by identifying volume divergences that exist at tops and bottoms.

METHOD

To calculate the volume force, the trend (T), daily measurement (DM) and cumulative measurement (CM) are required. The trend is derived simply by summing today's high, low and close and comparing it to the previous day's result based on the following criteria:

1 When today's sum is greater than the previous day, accu-

mulation has occurred and a (1) is assigned.

2 When today's sum is less than the previous day, distribution has occurred and a (-1) is assigned.

3 When equality exists, the existing trend is maintained.

The daily measurement (DM) is the difference between the daily price high and low and contains the basic data requisite to quantify the volume force. Finally, the cumulative measurement (CM) is the cumulative total of daily measurements in the direction of the trend, originating and terminating on trend changes.

The following spreadsheet serves to illustrate the proce-

CALCULATING THE KVO

	A	B	C	D	E	F	G	H	I	J	K	L	M
	Date	High	Low	Close	Vol.	T	DM	CM	VF	34 EMA	55 EMA	KVO	13-period trigger
1	10/15/93	27.5	26.5	27	16518	-1	1	1.75	-235971.48	-235971.48	-235971.48	0.00	0.00
2	10/18/93	28	26.75	27.875	19030	1	1.25	2.25	211444.44	-210424.03	-219998.73	9574.70	1369.18
3	10/19/93	27.75	26.25	26.5	20836	-1	1.5	2.75	-189418.18	-209224.60	-218907.01	9682.41	2557.97
4	10/20/93	27	25.75	26.25	9652	-1	1.25	4.00	-361950.00	-217945.22	-224013.64	6068.42	3059.97
5	10/21/93	27.5	25.5	27.375	10080	1	2	3.25	232615.38	-192218.21	-207711.98	15493.78	4838.00
6	10/22/93	28	26	26.125	14651	-1	2	4.00	0.00	-181242.55	-200296.67	19054.12	6870.91
7	10/25/93	26.75	25.5	26.125	12267	-1	1.25	5.25	-642557.14	-207583.61	-216085.37	8501.76	7104.12
8	10/26/93	26.5	25.75	26.375	8787	1	0.75	2.00	219675.00	-183187.14	-200528.72	17341.58	8568.08

Calculating the KVO in Excel will use the following formulas. The first row of values (row 2) are typed in as displayed. You will need more than 110 rows to have the exponential smoothed moving averages be up to the proper calculations. Begin with row 3 and insert the following formulas. Column F measures the direction of the trend. Enter into cell F3 the following formula and copy down:

=IF((B3+C3+D3)>(B2+C2+D2),1,-1)

Column G is the daily measurement that is the difference betwen the high and low each day. Enter into cell G3 the following formula and copy down:

=B3-C3

Column H is the cumulative measurement and is adjusted to reflect the change in the trend. Enter into cell H3 the following formula and copy down:

=(IF(AND(F3=1,F2=1),H2+G3,(IF(AND(F3=-1,F2=-1),H2+G3,G2+G3))))

Column I is the volume force. Enter into cell I3 the following formula and copy down:

=E3*(ABS(2*(G3/H3)-1))*F3*100

Column J is a 34-period exponential smoothed moving average. Enter into cell J3 the following formula and copy down:

=J2+0.0571*(I3-J2)

Column K is a 55-period exponential smoothed moving average. Enter into cell K3 the following formula and copy down:

=K2+0.0357*(I3-K2)

The KVO is the difference between the two EMAs. Enter into cell L3 the following formula and copy down:

=J3-K3

The final column is the trigger line, which is a 13-period exponential smoothed moving average of the KVO. Enter into cell M3 the following formula and copy down:

=M2+0.143*(L3-M2)

—*S.K.*

dure. Take, for example, October 19, 1993. The trend is distribution (-1) because the sum of the price range is less than the previous day's total. The daily measurement (DM) is 1.50 derived by subtracting the low from the high. The cumulative measurement (CM) is 2.75 derived by summing today's daily measurement and the previous day's daily measurement. Note in the example provided how the calculation for the cumulative measurement originated on October 19, 1993 (a trend change date) and terminated on October 20, 1993 (another trend change date). See sidebar, "Calculating the KVO," for an Excel spreadsheet example.

The volume force is expressed mathematically in the following formula:

$$VF = V \left| \left(2 \left(\frac{DM}{CM} \right) - 1 \right) \right| * T * 100$$

where:
V = Daily volume

T = Trend
DM = Daily measurement
CM = Cumulative measurement

The KVO is a momentum oscillator of the volume force. Mathematically, it is expressed in the following formula:

$$KVO = Mov(VF(\ ), 34, E) - Mov(VF(\ ), 55, E)$$

where:
1 Mov(VF( ), 34, E) is a 34-day EMA of the volume force.
2 Mov(VF( ), 55, E) is a 55-day EMA of the volume force.

RESULTS

Although the volume oscillator does an excellent job of quantifying the volume force behind price action, it is not a panacea. While the test results of the original study published in the Winter 1994/Spring 1995 *MTA Journal* reflected the

FIGURE 1: IOMEGA. Here, the KVO indicator reaches an extreme reading above the center line and reverses direction, which signals an exhaustion of the prevailing trend and warns of an impending price reversal.
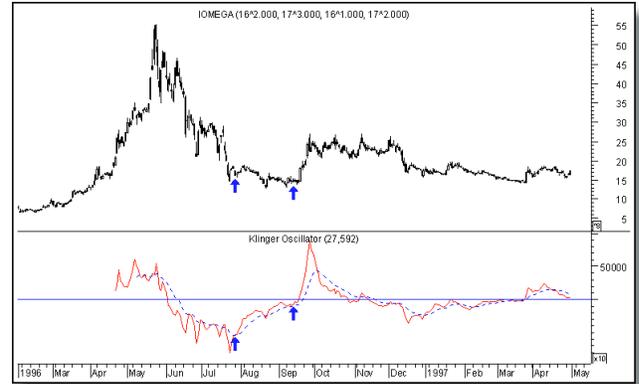
FIGURE 2: IOMEGA. The KVO gave a buy signal in July against the downtrend of the stock. Ultimately, more basing by the stock, accompanied by a rising volume force and a change in trend before a more meaningful trade, resulted in September.

general KVO methodology, no attempt was made to maximize the effect. One result of this was that there were approximately the same number of profitable trades as there were unprofitable ones. Nevertheless, the methodology did identify the significant moves, resulting in overall meaningful profits.

A common technique used by traders with oscillators is to initiate long or short positions on crossovers above and below the center line. While this is a popular method, it can limit the effective use of the KVO. The dominant characteristic of the KVO is the velocity at which it precedes price, alerting the trader to short-term price extremes. With the use of a trigger, trades can be initiated prior to the crossover of the center line and a price reversal. For the best signals, the following guidelines should be followed:

1 The most powerful use of the KVO comes when the indicator reaches an extreme reading either above or below the center line and reverses direction. This signals an exhaustion of the prevailing trend and warns of an impending reversal in price (Figure 1). Observe how the

KVO capitulated coincident with the price peak at 27 in September and then reversed direction, activating the trigger.

2 The most reliable signals occur in the direction of the prevailing trend. Trades against the trend tend to be high-risk ventures. Note how the KVO gave a buy signal in July against the prevailing trend but required more basing, accompanied by a rising volume force and a change in trend, before a more meaningful trade resulted in September (Figure 2).

3 The most important signal occurs when the KVO diverges from price action, especially on price extremes, either in overbought or oversold territory. When a security makes a new high or low for a cycle and the KVO fails to confirm this, the indicator is warning that the trend is losing momentum and nearing completion (Figure 3). Note how the KVO peaked in early May, warning of an impending reversal that was confirmed later in the same month when the stock peaked and the KVO made a lower top.

4 For investors with a longer-term horizon, the KVO can easily be converted to a cumulative oscillator using the

FIGURE 3: IOMEGA. If the KVO fails to confirm a security making a new high or low for a cycle, the indicator is warning that the trend is losing momentum and nearing completion.
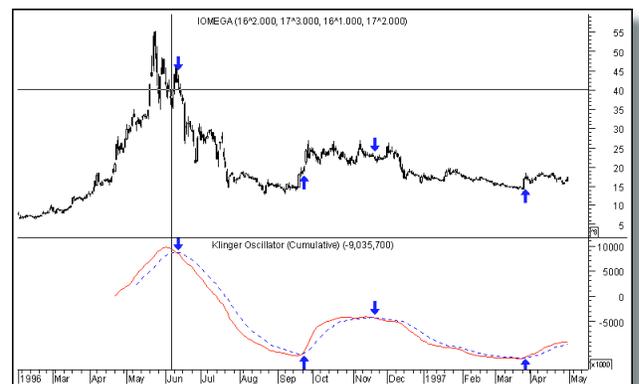

FIGURE 4: IOMEGA. This chart is an example of the KVO with a cumulative reading. The smoothing of the indicator results in fewer buy and sell signals. In addition, the cumulative version reflects the longer-term flow of money into and out of the security.

following custom formula in MetaStock. Figure 4 is an example of the KVO (cumulative). Note how it smoothes the indicator, resulting in fewer buy and sell signals, at the same time reflecting the longer-term flow of money into and out of the security.

CONCLUSION

While more research is needed on volume analysis, its effectiveness is well established in technical analysis. The KVO works well in identifying volume divergences that exist at tops and bottoms. However, better results can be achieved when the KVO is used in conjunction with other technical indicators. I recommend using Williams' %R† or Bollinger bands† for confirming an overbought or oversold price condition and a stochastic oscillator to confirm the short term direction of price.

MetaStock users can find the KVO published in the Indicator Quicklist menu under "Klinger oscillator." For additional information on the KVO, refer to the MetaStock for Windows 95 users' manual.

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REFERENCES

Colby, R.W., and T.A. Meyers [1988]. *The Encyclopedia of Technical Market Indicators*, Irwin Professional Publishing.

Klinger, Stephen J. [1995]. "The Klinger Volume Oscillator (KVO) — A Theoretical Model," *MTA Journal*, Winter 1994/Spring 1995.

MetaStock for Windows 95 users' manual, pages 411-13. EQUIS International, version 6.0.

Murphy, John J. [1986]. *Technical Analysis of the Futures Markets*, New York Institute of Finance.

†See Traders' Glossary for definition   S&C