Examining The VWAP Approach

The MIDAS Touch

Part 1

The volume-weighted average price can be applied to daytrading and short-term swing trading. Here's how.

by Andrew Coles, PhD

In a *Technical Analysis of* STOCKS & COMMODITIES article published in May 2001, George Reyna drew attention to how a certain type of volume-weighted average price (VWAP) calculation can be a powerful predictor of support and resistance associated with major reversals off the daily charts. This is a technique that would be of interest to the position trader.

The ingenuity behind this unique application of the VWAP principle can only be appreciated in the context of standard VWAP calculations, which have been extensively applied in the trading industry for many years. A standard VWAP calculation represents the total value of shares traded in a particular stock on a given day divided by the total volume of shares traded in that stock on that same day. This standard calculation is thus a method of pricing transactions and is typically used as a benchmark to measure the efficiency of institutional trading or the performance of traders themselves.

As an example, in the mutual and pension funds industry it is used as a trading benchmark: the point of using a VWAP trading target is to ensure that the trader executing the order

does so in line with the market volume. This way, transaction costs are reduced by minimizing market impact.

An extension of this idea is known as "guaranteed VWAP execution," whereby a broker may guarantee execution of an order at the VWAP in order to earn the trader's commission. As a means of evaluating trading performance, this standard calculation would figure in positive or negative appraisals being given to a long trade lower than or above its daily VWAP, respectively, and vice versa for short trades. A specific illustration is supplied by trader Kevin Haggerty in an interview he gave to S&C in 1999. In conjunction with other price and volume considerations, Haggerty examines whether a stock price has closed above its daily VWAP.

However, the aim of Reyna's study was to show how a new type of VWAP calculation created by the late Paul Levine, who was a physicist as well as a technical analyst, can be used to create nonlinear support and resistance curves predictive of major trend reversals. The present study extends this topic not only by exploring Levine's VWAP approach to technical analysis more deeply, but also, and most important, by applying the same VWAP technology to intraday charts and daytrading.

PAUL LEVINE'S PHILOSOPHY

When Levine was developing the VWAP support and resistance indicator, he called it "MIDAS," as both a play on the King Midas myth and an acronym for "market interpretation/data analysis system."

At the heart of MIDAS is a philosophy of technical analysis that is uniquely Levine's. While we do not have the space here to explore every aspect of this approach, we shall be looking at the most important ideas. Although Levine's philosophy was developed while he was studying the daily charts with longer-term price movements of interest to the position trader/longer-term swing trader, it is equally valid when applied to very short-term intraday time frames. In a nutshell, Levine's philosophy can be reduced to five basic tenets:

1 Superficially, markets appear disordered, but there is an underlying order that cannot be visually accessed by the majority of technical analysis tools. This order — a complex fractal hierarchy of support and resistance levels — is the fundamental reality underlying market price behavior.

2 This fundamental reality, the interplay between support and resistance, is in fact a coaction between accumulation and distribution

3 This trading psychology coaction can be considered quantitatively from raw price and volume data and reveals a mathematical symmetry between support

The ingenuity behind this application of the VWAP principle can only be appreciated in the context of standard VWAP calculations.

and resistance. This phenomenon is properly scientific; the quantitative characterization in MIDAS allows us to see what the apparently random patterns of stock prices actually consist of.

4 Markets can be predicted to a very large degree by using this single algorithmic procedure, which is symmetrical in the sense that the same formula applies in the prediction of market tops and bottoms.

5 To accomplish this, it is essential to focus on price and volume data *subsequent* to a reversal in trend and thus to a major change in sentiment. Price-derived instruments such as moving averages may omit these crucial periods of new psychology and neglect the critical importance of volume. By contrast, the MIDAS algorithm locates the real underlying order of markets — the fractally ordered hierarchical levels of support and resistance — at the volume-weighted average price taken over an interval subsequent to a reversal in trend.

These philosophical principles have been derived largely from a series of 18 tersely written articles that Levine published online in 1995. Levine referred to the quantitative laws that give rise to the support/resistance hierarchies as the scientific component of MIDAS. He called the engineering aspect the practical trading rules and techniques based on the system. Before coming to some of them — and expanding our understanding of MIDAS in the context of daytrading — we need to be introduced to the formula itself.

THE MIDAS FORMULA

The particular VWAP formula used by Paul Levine was fully discussed in George Reyna's article. The mathematical detail of the conceptual foundations we have just examined can be expressed as the following equation:

$$\text{MIDAS} = \frac{\left[y_i(x_i) - y_{ij}(x_i - d_{ij}) \right]}{d_{ij}}$$

where:

x_i = Cumulative volume on day
y_i = Cumulative price on day
d_{ij} = Cumulative volume difference between days i and j
$= x_i - x_j$

This equation reads: (The cumulative price)(Volume at a given instant) − (The cumulative price)(Volume at a period d units of cumulative volume earlier), all divided by d, where d is the cumulative volume displacement measured from the launch point to the given instant.

However, of critical importance is the launch point of the system. As we saw in the fifth tenet, this point must be precisely where there is a clear reversal in trend. It is critical not to use periods before this because they mix periods of differing underlying psychology and thus contaminate new shifts in accumulation or distribution.

FIGURE 1: DAILY CHART OF THE CONTINUOUS LIGHT SWEET CRUDE OIL FUTURES FROM MARCH 2006 TO SEPTEMBER 2007. R1 (green curve) resists the market until the divergence in OBV suggests that the swing low beginning in mid-January 2007 will be the start of a new trend. Accordingly, an M (support) curve is immediately plotted (S1, red plot). As the trend develops, younger curves such as S2 (blue plot) must also be created. A market can usually support/resist four to five curves before reversing. As such, this number of curves is a dependable overbought/oversold indicator.

Figure 1 is a daily chart created in MetaStock of the continuous light sweet crude oil futures from March 2006 to September 2007. Here the MIDAS formula plotted from the swing high in July 2006 (R1, green curve) and the swing low of January 2007 (S1, red curve) creates powerful resistance and support curves. Note, too, the blue curve (S2) from March 2007, which has been created as the trend develops.

It is an important part of Levine's approach to MIDAS that "younger" curves should be plotted as the trend develops. This embodies his idea that the markets are related hierarchical fractals of support and resistance. Levine was of the opinion that a trend could support (or resist) a maximum of four to five curves before it ended.

A final component of this chart is Joseph Granville's on-balance volume (OBV) indicator, which will be discussed in more detail later. In Figure 1, the fact that the price low of January 2007 is not confirmed in OBV means that R1 is likely to be penetrated by price and therefore that S1 is going to become a new genuine support curve to a new price trend. We will examine in more detail the engineering aspects of MIDAS in the context of intraday charts.

For position traders and longer-term swing traders, the MetaStock formula code for plotting MIDAS on the daily charts is supplied as the first code in the sidebar, "Programming MIDAS and I-MIDAS in MetaStock." As noted in tenet 4, the formula is symmetrical, meaning that only the place where the formula is launched differs in application and not the formula itself.

On dropping the MIDAS indicator onto a daily chart, MetaStock will prompt for the starting month, the starting day of the month, and the starting year. To obtain a better understanding of these ideas, position traders and longer-term swing traders can follow the application of MIDAS to intraday charts. The same principles will apply.

APPLYING MIDAS TO INTRADAY CHARTS

What makes the application of MIDAS to intraday charts so compelling is a central tenet of Levine's market philosophy, that the underlying order is a fractal hierarchy of support and resistance levels. Levine did not consider the implication of fractal organization for other chart time frames. But it is a central part of his application of MIDAS to the daily

The formula was first encoded by Levine soon after he began writing his articles for Windows On Wall Street, the now-obsolete 1990s trading platform. By the time Levine finished his articles, he and his co-developer Stokes Fishburne had made MIDAS available in a software platform called WinMidas. At the time of Reyna's article in 2001, Fishburne was still making trial copies available without technical support. Currently, however, while the WinMidas website is back online, the actual MIDAS indicators are no longer available to the trading public.

To demonstrate the power of MIDAS on the longer-term trading horizon to the position traders who may be reading this, we can supply one illustration, though such readers should consult Reyna's article where the longer-term predictive power of MIDAS is highlighted on a number of stocks.

DAX March 08 (6,851.00, 6,851.00, 6,849.50, 6,850.50, -0.50), I-MIDAS (6,925.46), I-MIDAS (6,927.53), I-MIDAS (6,924.46), I-MIDAS (6,924.80), I-MIDAS (6,932.79)

FIGURE 2: 1M CHART OF XETRA DAX MARCH 2008 FUTURES. Whatever the trend, be it daily or intraday, once it develops and becomes mature, newer support or resistance curves must be plotted. Here, in line with Paul Levine's view that four to five curves signify an overbought/oversold market, the trend completes after R5 (dark blue curve) has been plotted.

charts that MIDAS curves should be plotted on smaller components of the trend as well as its larger components.

We have just seen an instance of this in S2 (blue curve) plotted from March 2007 as the trend in crude oil develops. And we have also seen an important implication of this idea, namely that trends cannot, in Levine's opinion, support (resist) more than four to five curves. All we are doing is extending this idea further by exploiting a central idea in fractal concepts of the financial markets, namely that they are self-similar at all degrees of trend.

The only difference in intraday charts is the obvious localization of volume and the launch point to a particular intraday reversal bar, marking an appropriate swing high or low (more on the choice of bar later). Here we not only require

the year, the month, and the day — as for daily charts — but also the hour and minute.

Fortunately, the MetaStock formula code allows the user to reference these parameters and the revised code for intraday charts is the second one in the sidebar. On dropping the I-MIDAS (the "I" stands for "intraday") indicator onto an intraday bar, MetaStock will prompt for the same three items of data as descri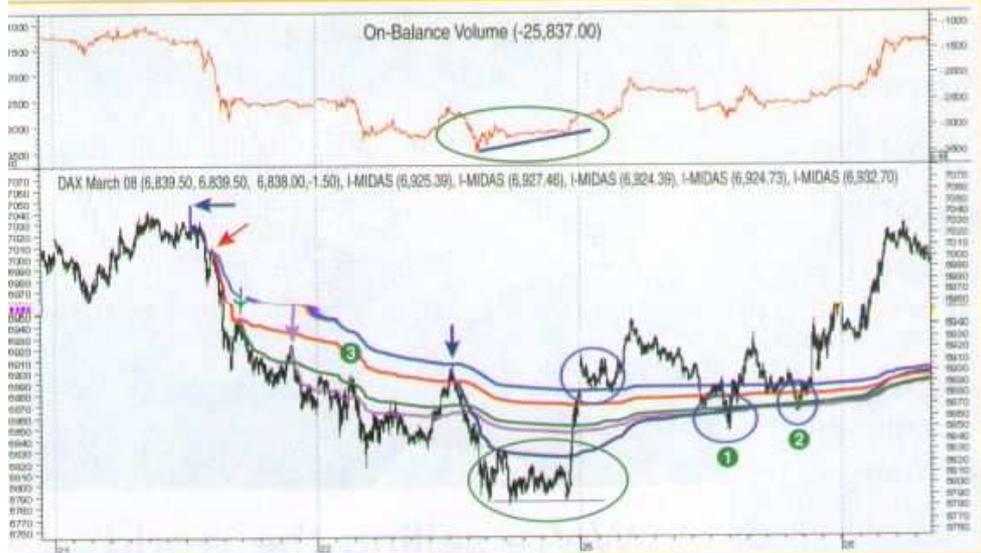bed previously in addition to the hour and minute. All this data is easy to obtain in MetaStock simply by hovering the mouse-pointer over the bar in question.

ENGINEERING I-MIDAS FOR DAYTRADING

Levine discussed the engineering aspects of MIDAS in the context of the daily charts, but all of his trading rules can be applied to intraday charts. Figure 2 is a 1M chart of the March 2008 Xetra DAX index futures from February 21 to 25. We shall use it to illustrate Levine's trading ideas before adding new observations unique to the application of I-MIDAS to daytrading.

Paul Levine's position trading rules transferred from daily charts to intraday charts:

PROGRAMMING MIDAS AND I-MIDAS IN METASTOCK

Code 1: This code is for MIDAS to plot on the daily charts in MetaStock in the way originally conceived by Paul Levine. Users will be requested to input a year, month, and day corresponding to an appropriate swing high or low.

```
{User defined input}
sm:=Input("starting month",1,12,1);
sd:=Input("starting day of month",1,31,1);
sy:=Input("starting year",1980,2100,2000);
start:= sd=DayOfMonth() AND sm=Month() AND sy=Year();
{mid price}
pv:=MP()*V;
{Midas calculation}
denom:= If(Cum(V)-
ValueWhen(1,start,Cum(V))=0,1,Cum(V)-
ValueWhen(1,start,Cum(V)));
If(BarsSince(start),(Cum(pv)-ValueWhen(1,start,Cum(pv)))/
denom,MP())
```

Code 2: This code is for I-MIDAS to plot on any intraday chart in MetaStock Pro. Users will also be requested to input the hour and minute. Speed can be an issue when a number of M curves are plotted in MetaStock and MetaStock Pro. This is an area currently being worked on by the author.

```
{User defined input}
sm:=Input("starting month",1,12,1);
sd:=Input("starting day of month",1,31,1);
sy:=Input("starting year",1980,2100,2000);
sh:=Input("hour", 1,24,1);
se:=Input("minute",0,60,0);
start:= sd=DayOfMonth() AND sm=Month() AND sy=Year()
AND sh=Hour() AND se=Minute();
{mid price}
pv:=MP()*V;
{Midas calculation}
denom:= If(Cum(V)-
ValueWhen(1,start,Cum(V))=0,1,Cum(V)-
ValueWhen(1,start,Cum(V)));
If(BarsSince(start),(Cum(pv)-ValueWhen(1,start,Cum(pv)))/
denom,MP())
```
—A.C.

FIGURE 3: 1M CHART OF XETRA DAX MARCH 2008 FUTURES WITH GRANVILLE'S OBV. A positive divergence in OBV indicates that most, if not all, of the younger curves will be penetrated in the impending move. This is precisely what happens late in the day and, come the close, only R1 (blue curve), the most mature curve, resists price going into the close. The following day, it too is penetrated when the market gaps open before it finds key early-day support on this curve.
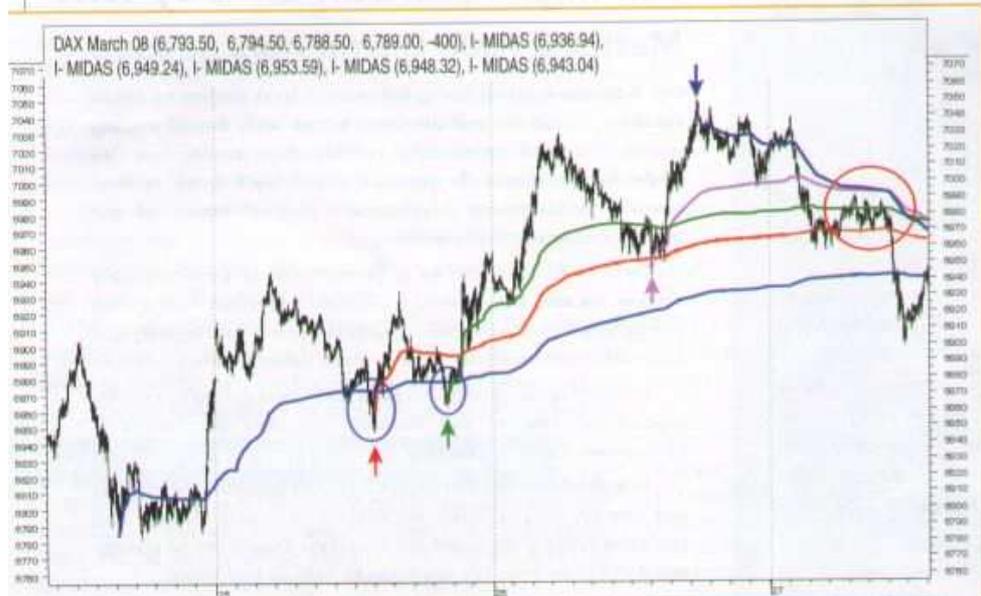

FIGURE 4: 1M CHART OF XETRA DAX MARCH 2008 FUTURES WITH FOUR SUPPORT CURVES. Once the trend changes, in this case from a downtrend to an uptrend, new support curves must immediately be plotted. Here we have the converse situation to Figure 2 with regard to the plotting and interpretation of M curves. The trend ends after the creation of a fourth M curve.

plotted from the main swing high preceding the trend. R2 (red curve plotted from the red arrow) offers the next tier of resistance, followed by R3 (green), R4 (magenta), and R5 (dark blue). As noted, Levine observed that most trends cannot resist (support) more than a fourth or a fifth curve because it is by then severely oversold (overbought). Here, we see R5 resisting the market sharply when plotted from the swing high that was met with resistance by R1 before price eventually broke through to close at R1 resistance. The chart would become too busy if all of the resistance areas (sell signals) created by these curves were highlighted. The reader can identify these for himself.

2 Levine spoke often of what he called price "porosity" or "elasticity," meaning that price will

1 As a trend develops, a hierarchy of support (resistance) curves can be created from newer support or resistance levels in the case of a downtrend. In Figure 2 this is well illustrated. Here, R1 (blue curve starting from the blue arrow) offers the broadest resistance to the market when

sometimes penetrate a curve by a small margin before responding to it. We can see several instances of porosity on Figure 2. The most emphatic example can be found above the green "1," while the price action above "2" and below "3" also provide illustrations.

3 In a downtrend, resistance curves will usually become support curves when they are penetrated (and vice versa for an uptrend). Examples in Figure 2 revolve around what happened after the market closed against R1 resistance on February 22. The following day, the market gapped up before finding support on R1. Later in the day, R1 support

As a trend develops, a hierarchy of support (resistance) curves can be created from newer support or resistance levels in case of a downtrend.

becomes R1 resistance, again as price breaks down through above "1." Likewise, R5 (dark blue) becomes major support instead of resistance above "1" and "2," creating two dramatic intraday surges.

4 To gain insight into whether a support curve is likely to ~~continue supporting price,~~ Levine used Granville's OBV. OBV also uses cumulative volume, though Levine preferred to use the midprice instead of the close. In effect, OBV measures the strength of the support curve by generating its own signals. To the uninitiated, these boil down to whether OBV is confirming price. In a downtrend, OBV should be falling with price: a divergence is a warning that the trend is weakening. In general, any change in OBV that precedes a change in price should be taken as advance notification that price too is likely to reverse, if not consolidate.

A thorough overview of the merits of applying OBV to intraday charts can be found in the January 2004 S&C, in D.W. Davies' article "Daytrading With On-Balance Volume." If we turn to Figure 3, which is merely Figure 2 with OBV added, we can see that OBV begins trending upward for several hours going into the close of February 22 while the price repeatedly tests a bottom created several hours earlier. This positive divergence with price would be a strong signal for Levine that the various resistance curves would at some stage come under severe pressure from price. This is what we see in the last hour going into the close when price breaks every resistance curve except R1, the most dominant of the curves plotted from the very beginning of the downtrend at the major swing high of February 21.

5 Once a probable bottom is in place, the MIDAS indicator can be plotted from the swing low to create a series of support curves. In Figure 4 we have simply moved the chart on a few days and added four such curves, S1 (blue) through to S4 (magenta). The trend ended after the fourth curve was plotted, again supporting Levine's view that a market cannot support or resist more than four to five curves. Again, the chart would be too busy if all of the support areas (buy signals) created by these curves were highlighted. The reader can again identify these for himself.

Notable areas of porosity include the areas highlighted by blue rings. Support also becomes resistance over on the far right of the chart highlighted by the red circle. What we have also done in Figure 4 is plot a resistance curve highlighted by the dark blue arrow from the intraday high of February 26. There is a fair amount of porosity to begin with, but the line quickly conjoins other support curves inside the red circle.

At this stage, a truly short-term daytrader might object that while these intraday charts are an impressive illustration of I-MIDAS, the indicator simply does not generate enough signals for a very active daytrader. This objection would not be

well-founded, as we shall see on a much closer examination of intraday price action.

The charts we have so far considered were used to illustrate the main tenets behind Levine's own approach to using MIDAS. In the next issue, we will look at a few more charts of even higher intraday resolution to highlight several additional features of MIDAS (or I-MIDAS, its intraday counterpart), which have emerged as a result of personal experience in researching I-MIDAS.

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SUGGESTED READING

Davies, D.W. [2004]. "Daytrading With On-Balance Volume," *Technical Analysis of* STOCKS & COMMODITIES, Volume 22: January.

Hartle, Thom [1999]. "A Guide To Conquering The Trading Markets: Kevin Haggerty," *Technical Analysis of* STOCKS & COMMODITIES, Volume 17: August.

Reyna, George [2001]. "Volume-Weighted Average Price For Support And Resistance," *Technical Analysis of* STOCKS & COMMODITIES, Volume 19: May.

Sweeney, John [1998]. "WinMidas 2.1," product review, *Technical Analysis of* STOCKS & COMMODITIES, Volume 16: May.

‡MetaStock (Equis International)

See our Traders' Tips section beginning on page 71 for program code implementing Andrew Coles's technique.

‡See Editorial Resource Index

S&C

```
}else{
    CumVol = CumVol_.1+nVolume;
    CumPriceVol = CumPriceVol_1+(nMP*nVolume);
}
    if(Start==false && month(0)==xMonth && day(0)==xDay &&
year(0)==xYear && hour(0)==xHour && minute(0)==xMinute) {
        CumVolAtStart = CumVol-nVolume;
        CumPriceVolAtStart = CumPriceVol-(nMP*nVolume);
        BarCounter=1;
        Start = true;
    }
    if(BarCounter==0){
        return;
    }else if(BarCounter==1){
        var MIDAS = nMP;
    }else if(BarCounter>1){
        var Denom = CumVol-CumVolAtStart;
        if(Denom==0) Denom = 1;
        var MIDAS = (CumPriceVol-CumPriceVolAtStart)/Denom;
    }
    return MIDAS;
}

function verify() {
    var b = false;
    if (getBuildNumber() < 779) {
        drawTextAbsolute(5, 35, "This study requires version 8.0 or
later.",
            Color.white, Color.blue,
Text.RELATIVETOBOTTOM|Text.RELATIVETOLEFT|Text.BOLD|Text.LEFT,
            null, 13, "error");
        drawTextAbsolute(5, 20, "Click HERE to
upgrade.@URL=http://www.esignal.com/download/default.asp",
            Color.white, Color.blue,
Text.RELATIVETOBOTTOM|Text.RELATIVETOLEFT|Text.BOLD|Text.LEFT,
            null, 13, "upgrade");
        return b;
    } else {
        b = true;
    }
    return b;
}
```

—Jason Keck
eSignal, a division of Interactive Data Corp.
800 815-8256, www.esignalcentral.com

Wealth Lab.com

✦ WEALTH-LAB: MIDAS INDICATOR

We've now added the MIDAS indicator to our collection of drag-and-drop indicators (Figure 3, inset), based on "The MIDAS Touch, Part 1" by Andrew Coles in this issue.

By including the starting bar number as a parameter, the indicator is fully programmable, and our script demonstrates how a number of MIDAS curves can be effortlessly added to a chart for quick viewing. The script plots five MIDAS indicators for the most-recent 7% peaks and troughs (Figure 3).

WealthScript code:
```
// Code for Execute method
// Don't forget to add: using TASCindicators;
const int c = 6;
const double pct = 7d;
Color[] color = new Color[c];
color[0] = Color.Blue;
```

FIGURE 3: WEALTH-LAB, MIDAS INDICATOR. The indicators were plotted here automatically by programming a simple peak/trough search and using the bar number results to obtain a new MIDAS indicator.

```
color[1] = Color.Red;
color[2] = Color.BlueViolet;
color[3] = Color.Fuchsia;
color[4] = Color.Green;

DataSeries ap = AveragePrice.Series(Bars);
DataSeries pbSer = PeakBar.Series(ap, pct,
PeakTroughMode.Percent);
DataSeries tbSer = TroughBar.Series(ap, pct,
PeakTroughMode.Percent);
int bar = Bars.Count - 1;
int n = 0;
while (bar > 1 && n < c)
{
    int pb = (int)pbSer[bar];
    int tb = (int)tbSer[bar];
    bar = Math.Max( pb, tb );
    DataSeries midas = Midas.Series(Bars, bar);
    PlotSeries(PricePane, midas, color[n], LineStyle.Solid, 2);
    n += 1;
    bar -= 1;
}
```

— Robert Sucher
www.wealth-lab.com

AmiBroker
for Windows 95/98/Me/NT/2k/XP

✦ AMIBROKER: MIDAS INDICATOR

In "Examining The VWAP Approach: The MIDAS Touch, Part 1" in this issue, author Andrew Coles presents a variant of the volume-weighted average price indicator. Coding the MIDAS indicator is very easy and straightforward in AmiBroker.

Listing 1 shows a ready-to-use formula for both end-of-day and intraday charts. When using it for end-of-day charts, simply leave the time setting untouched. The single formula allows up to five MIDAS plots starting from different dates/times. If you need more, simply replace the number 5 in the "for" loop with any numeral of your choice.

To use the code, simply enter it in the Formula Editor, then choose the Tools->Apply Indicator menu from the editor. You

FIGURE 4: AMIBROKER, MIDAS INDICATOR. Here is a daily chart of OIL with two MIDAS lines. You can use the parameter window to adjust starting dates of up to five MIDAS indicators.

can use the parameters window (available from the right-click menu) to set the starting date/time for MIDAS plots.

LISTING 1

```
Plot( C, "Price " + Date(), colorBlack, styleCandle );

for( i = 1; i <= 5; i++ )
{
  startdate = ParamDate("Starting Date " + i, "2000-01-01");
  starttime = ParamTime("Starting Time " + i, "00:00:00" );

  start = DateNum() < startdate AND TimeNum() <= starttime;

  mp = (H+L)/2;
  pv = Volume * mp;

  denom = Cum( V ) - ValueWhen( start, Cum( V ) );
  nom = Cum( pv ) - ValueWhen( start, Cum( pv ) );

  midas = IIf( BarsSince( start ), nom/denom, Null );

  Plot( midas, "Midas" + i, colorRed + i, styleLine | styleThick |
styleNoRescale );
}
```

A sample chart is shown in Figure 4.

—*Tomasz Janeczko, AmiBroker.com*
www.amibroker.com

◆ NEUROSHELL TRADER: MIDAS INDICATOR

The MIDAS indicator described by Andrew Coles in "The MIDAS Touch, Part 1" in this issue can be easily implemented in NeuroShell Trader by combining a few of NeuroShell Trader's 800+ indicators. Select "New Indicator ..." from the Insert menu and use the Indicator Wizard to create the following indicators:

FIGURE 5: NEUROSHELL TRADER, MIDAS INDICATOR

BARNUM:
  CumSum(Add2(1,0),0)

BARVOLUME:
  If ThenElse(A>=B(BARNUM, StartBar#), Volume, 0)

MIDAS:
  Divide(CumSum(Multiply2(Avg2(High, Low), BARVOLUME), 0),
CumSum(BARVOLUME, 0))

As described in the article, the MIDAS indicator should only begin computing after clear reversals in trend as identified visually on the price chart. The MIDAS indicator formula given above accomplishes this by beginning computation on the bar number identified by the StartBar# parameter. To determine an appropriate StartBar# value, insert the BARNUM indicator on your chart and set the MIDAS indicator's StartBar# to the BARNUM indicator's value at a visually identified trend reversal.

A sample chart is shown in Figure 5. For more information on NeuroShell Trader, visit **www.NeuroShell.com**.

—*Marge Sherald, Ward Systems Group, Inc.*
301 662-7950, sales@wardsystems.com
www.neuroshell.com

◆ CQG: MIDAS INDICATOR

Here is a CQG custom study definition based on the article, "Examining The VWAP Approach: The MIDAS Touch, Part 1" by Andrew Coles. A sample chart is shown in Figure 6.

The study shown here matches the Excel spreadsheet calculations used in George Reyna's 2001 STOCKS & COMMODITIES article "Volume-Weighted Average Price For Support And Resistance" referenced in Coles's article in this issue.

```
/* 1) Create Parameters:...... month...day....year...hour and
minute.....These are case sensitive.
  2) Check the overlaid box when creating this custom study.
```

FIGURE 6: CQG, MIDAS INDICATOR

FIGURE 7: TD AMERITRADE STRATEGYDESK, MIDAS INDICATOR. Google Inc. (GOOG) experienced a reversal on June 17, the date we began to plot MIDAS on the daily chart shown here. A lower indicator has been added that identifies the on-balance volume (OBV) for the same period.

3) Add to chart ...right click to modify... set display scale to ON from AUTO

4) In addition, to recreate this study you will need to add a temporary parameter

called PeriodForSummation, insert into the sum function, then delete this from list of parameters.*/

```
DailyTime:=  Month(@)=month  AND  Day(@)=day  AND
Year(@)=year;
IntraDayTime:= Hour(@)=hour AND Minute(@)=minute;
Time:= IF( BarInterval(@,none) < BarInterval(@,D), DailyTime AND
IntraDayTime, DailyTime);
PeriodForSummation:= BarsSince(Time,1,10000)+1;
CumVol:= Sum(Vol(@),PeriodForSummation);
CumMidAndVol:= Sum(Mid(@)* Vol(@),PeriodForSummation);
VolOnDayOne:= Vol(@) WHEN PeriodForSummation=1;
MidVolOnDayOne:=CumMidAndVol WHEN PeriodForSummation=1;

MidasVWAP:=  IF(PeriodForSummation  =  1,  Mid(@),
(CumMidAndVol-MidVolOnDayOne)/(CumVol-VolOnDayOne));
```

A CQG component pac is available at the CQG website (http://www.cqg.com/Support/Downloads.aspx) for installing this study in CQG.

—*Thom Hartle*
www.CQG.com

TD AMERITRADE

♦ TD AMERITRADE'S STRATEGYDESK: MIDAS INDICATOR

In his article in this issue, "Examining The VWAP Approach: The MIDAS Touch, Part 1," Andrew Coles highlights a trading system using volume-weighted average price (VWAP) calculations. This system, developed by the late physicist and technical analyst Paul Levine, can be used to create support and resistance curves that can apply to both short and long-term time frames. Here is an interpretation using TD Ameritrade's StrategyDesk.

In the article, Coles discusses how volume-weighted average price can be used to identify support and resistance curves

following a clear trend reversal. Using StrategyDesk, these curves can be created as custom chart studies using the volume-weighted moving average formula shown here. Again, since this system is based on a reversal in trend, we must be mindful of the reversal's starting point.

```
(Bar[Date,D] = 20080617) * (MovingAverage[VWMA,High,1,0,D] +
MovingAverage[VWMA,Low,1,0,D]) / 2 + (Bar[Date,D] = 20080618) *
(MovingAverage[VWMA,High,2,0,D] +
MovingAverage[VWMA,Low,2,0,D]) / 2 +
(Bar[Date,D] = 20080619) * (MovingAverage[VWMA,High,3,0,D] +
MovingAverage[VWMA,Low,3,0,D]) / 2 + (Bar[Date,D] =
20080620) *
(MovingAverage[VWMA,High,4,0,D] +
MovingAverage[VWMA,Low,4,0,D]) / 2 +
(Bar[Date,D] = 20080623) * (MovingAverage[VWMA,High,5,0,D] +
MovingAverage[VWMA,Low,5,0,D]) / 2 + (Bar[Date,D] =
20080624) *
(MovingAverage[VWMA,High,6,0,D] +
MovingAverage[VWMA,Low,6,0,D]) / 2 +
(Bar[Date,D] = 20080625) * (MovingAverage[VWMA,High,7,0,D] +
MovingAverage[VWMA,Low,7,0,D]) / 2 + (Bar[Date,D] =
20080626) *
(MovingAverage[VWMA,High,8,0,D] +
MovingAverage[VWMA,Low,8,0,D]) / 2 +
(Bar[Date,D] = 20080627) * (MovingAverage[VWMA,High,9,0,D] +
MovingAverage[VWMA,Low,9,0,D]) / 2 + (Bar[Date,D] =
20080630) *
(MovingAverage[VWMA,High,10,0,D] +
MovingAverage[VWMA,Low,10,0,D]) / 2 +
(Bar[Date,D] = 20080701) * (MovingAverage[VWMA,High,11,0,D]
+
MovingAverage[VWMA,Low,11,0,D]) / 2 + (Bar[Date,D] =
20080702) *
(MovingAverage[VWMA,High,12,0,D] +
MovingAverage[VWMA,Low,12,0,D]) / 2 +
(Bar[Date,D] = 20080703) * (MovingAverage[VWMA,High,13,0,D] +
MovingAverage[VWMA,Low,13,0,D]) / 2
```

Using StrategyDesk, it is possible to track multiple support or resistance curves at once, as new trends begin. As is also discussed in Coles's article in this issue, an on-balance volume (OBV) indicator can be applied to the chart. See Figure 7.

If you have questions about this formula or functionality, please call TD AMERITRADE's StrategyDesk help line at 800 228-8056, free of charge, or access the Help Center via the StrategyDesk application. StrategyDesk is a downloadable application free for all TD AMERITRADE clients. Regular commission rates apply.

TD AMERITRADE and StrategyDesk do not endorse or recommend any particular trading strategy.

—Jeff Anderson
TD AMERITRADE Holding Corp.
www.tdameritrade.com

◆ AIQ: MIDAS INDICATOR

The AIQ code for Andrew Coles's article, "The MIDAS Touch, Part 1," is shown here. The author's version of the indicator, which is a variation of a volume-weighted moving average, is oriented toward discretionary trading because it requires visual examination of a chart to determine the significant low and high dates that are then input manually into the indicator before it can be used.

I prefer to work with mechanical methods that can be backtested, so when I coded Coles's version of the indicator, I converted the indicator to an adaptive one (RD VWAP) that automatically finds the most recent high and low pivot dates and then plots the VWAP automatically from these dates. My version of the indicator will plot automatically on any chart and the only input required is the strength (bars on each side of the pivot).

To test the indicator, I devised a simple trading system based on a trend-following technique of buying when the close crosses above the VWAP adaptive indicator. I ran simulations using the NASDAQ 100 list of stocks. To run tests on a portfolio level, I used the following trade selection rules and capitalization rules: the trades were selected using 32-day AIQ relative strength, taking the top three strongest signals per day, 10% of capital per position, with a maximum of 10 open positions. Positions were exited on a reversing signal.

I was curious as to whether the new indicator would outperform a simple moving average crossover (SMACO) system. I used a moving average length equal to 2 times the strength parameter of the VWAP +1. I ran comparative tests over the period 10/15/2002 to 7/11/2008 using the same list of stocks and the same exit conditions, with the difference being in the indicator driving the entries and exits. On the long-only test comparison, shown in Figure 8, the RD VWAP adaptive system (blue line) showed almost identical results to the SMACO system (red line) on all the various metrics. The short-side-only test comparison (not shown) was also nearly identical to the standard moving average crossover system. For both systems, shorting the NASDAQ 100 stocks during the test period (which is mostly a bullish period) lost at the rate of 27% per year. Both of the systems need market timing and/or trend filters to make the short side work. A trend filter

FIGURE 8: AIQ, MIDAS INDICATOR. Here is a comparison of RD VWAP adaptive and SMACO systems (long only). The RD VWAP system showed no significant difference from the SMA system in a portfolio simulation using the NASDAQ 100 stocks.

might reduce the drawdown from the long side as well.

The code can be downloaded from the AIQ website at **www.aiqsystems.com** and also from www.tradersedge systems.com/traderstips.htm, or can be copied and pasted from the STOCKS & COMMODITIES website at **Traders.com**.

```
! MIDAS TOUCH AKA VWAP INDICATOR
! Author: Andrew Coles, PhD, TASC September 2008
! Coded by: Richard Denning 7/08/08

! INPUTS:
Month1 is 06. Day1 is 05.Year1 is 2008 .
Month2 is 03. Day2 is 17.Year2 is 2008 .
Month3 is01. Day3 is 23. Year3 is 2008.
Month4 is 12. Day4 is 11.Year4 is 2007.

! VARIABLES
bars1      is OffSetToDate(month1,day1,year1).
bars2      is OffSetToDate(month2,day2,year2).
bars3      is OffSetToDate(month3,day3,year3).
bars4      is OffSetToDate(month4,day4,year4).
date1      is makedate(month1,day1,year1).
date2      is makedate(month2,day2,year2).
date3      is makedate(month3,day3,year3).
date4      is makedate(month4,day4,year4).

MP         is ([high]+[low])/2.
V          is [volume].

CPV1       is sum(MP * V,^bars1).
CPV2       is sum(MP * V,^bars2).
CPV3       is sum(MP * V,^bars3).
CPV4       is sum(MP * V,^bars4).

CV1        is sum(V,^bars1).
CV2        is sum(V,^bars2).
CV3        is sum(V,^bars3).
CV4        is sum(V,^bars4).

! DISCRETIONALRY INDICATORS TO PLOT:
VWAP1   is iff(reportdate()>date1 and CV1>0, CPV1 / CV1,MP).
VWAP2   is iff(reportdate()>date2 and CV2>0, CPV2 / CV2,MP).
VWAP3   is iff(reportdate()>date3 and CV3>0, CPV3 / CV3,MP).
VWAP4   is iff(reportdate()>date4 and CV4>0, CPV4 / CV4,MP).

!_____RD VWAP ADAPTIVE INDICATOR_____
!! PIVOTS-TWO LOW AND TWO HIGH
! Coded by: Richard Denning 9/12/06

!COMMON SETUP INFORMATION
        periods is 252.      !Total look back period
        Define   strength   12.
!Number of bars on each side of pivot
        OTD              is
```

```
Offsettodate(Month(),Day(),Year()).
       LowR        is LoVal([low],(2*strength)+1).
       LowM        is Val([low],strength).
       LS          if  LowR = LowM.
       HighR       is HiVal([high],(2*strength)+1).
       HighM       is Val([high],strength).
       HS          if  HighR = HighM.


!FIND FIRST PIVOT LOW
       LT1         is scanany(LS,periods) then OTD .
       LO1         is ^LT1 + Strength.
       LO1dte      is SetDate(LO1).
       LowLO1      is val([low],^LO1).

!FIND SECOND PIVOT LOW THAT IS BEFORE THE FIRST PIVOT LOW
       LT2         is scanany(LS,periods,LO1) then
OTD.
       LO2         is ^LT2 + Strength.
       LO2dte      is SetDate(LO2).
       LowLO2      is val([low],^LO2).

!FIND FIRST PIVOT HIGH
       HT1         is scanany(HS,periods,0) then OTD

       HO1         is ^HT1 + Strength.
       HO1dte      is SetDate(HO1).
       HighHO1     is val([high],HO1).

!FIND SECOND PIVOT HIGH THAT IS BEFORE THE FIRST PIVOT HIGH
       HT2         is scanany(HS,periods,HO1) then
OTD.
       HO2         is ^HT2 + Strength.
       HO2dte      is SetDate(HO2).
       HighHO2     is val([high],HO2).

bars5     is min(LO1,HO1).
CPV5      is sum(MP * V,bars5).
CV5       is sum(V,bars5).

! RD VWAP INDICATOR TO PLOT:
VWAP5   is iff(CV5 <> 0, CPV5 / CV5,[close]).


!———
! VWAP ADAPTIVE CROSSOVER SYSTEM:
HD  if hasdatafor(300)>=252.
!Long Entry rule:
   LEvwap if HD and countof([close] > VWAP5,2)=2.
!Long Exit rule:
   LXvwap if countof([close] < VWAP5,2)=2.
!Short Entry rule:
   SEvwap if HD and countof([close] < VWAP5,2)=2.
!Short Exit rule:
   SXvwap if countof([close] > VWAP5,2)=2.

! SIMPLE MOVING AVERAGE CROSSOVER SYSTEM:
!Long Entry rule:
   LEsma if HD and countof([close] > simpleavg([close],25),2)=2.
!Long Exit rule:
   LXsma if HD and countof([close] < simpleavg([close],25),2)=2.
!Short Entry rule:
   SEsma if HD and countof([close] < simpleavg([close],25),2)=2.
!Short Exit rule:
   SXsma if HD and countof([close] > simpleavg([close],25),2)=2.
```

—*Richard Denning*
AIQ Systems
richard.denning@earthlink.net

◆ TRADERSSTUDIO: MIDAS INDICATOR

The TradersStudio code for Andrew Coles's article in this issue, "The MIDAS Touch, Part 1," is shown here.

The code for the author's version of the indicator, which is

FIGURE 9: TRADERSSTUDIO, THE MIDAS INDICATOR. Here is an example of the RD VWAP indicator shown on a reverse-adjusted chart of crude oil with a 12-bar pivot/swing bar strength in TradersStudio. The lines step when the indicator recognizes a newly formed pivot/swing point.

Comparison of Key Statistics:
TradePlan is TS_PERCENTMARGINPLAN(10, 100)
Test Period: 12/24/1992 to 7/11/2008

	VWAP	SMA
Performance Summary: All Trades		
Total Net Profit	*******	*******
Max intraday drawdown	(763,426)	(704,936)
Profit Factor	1.14	1.12
Net Profit / Max drawdown	2.45	1.86
Performance Summary: Long Trades		
Total Net Profit	*******	*******
Max intraday drawdown	(735,036)	(681,697)
Profit Factor	1.26	1.21
Net Profit / Max drawdown	2.26	1.72
Performance Summary: Short Trades		
Total Net Profit	206,635	137,912
Max intraday drawdown	(861,424)	(723,231)
Profit Factor	1.02	1.02
Net Profit / Max drawdown	0.24	0.19

Reverse adjusted, continuous contract futures portfolio used for above tests: Cotton, EuroCurrency, Copper, Yen, Natural Gas, Sugar, Ten-Year T-Note

FIGURE 10: TRADERSSTUDIO, VOLUME-WEIGHTED ADAPTIVE PRICE SYSTEM VS. SIMPLE MOVING AVERAGE CROSSOVER SYSTEM. This table shows a comparison of the RD VWAP adaptive and SMACO systems: The RD VWAP system showed better metrics than the SMA system in a portfolio simulation trading a diversified portfolio of seven futures contracts.

a variation of a volume-weighted moving average, is listed under the heading "Midas Touch Indicator." Because I prefer to work with mechanical methods that can be backtested, I converted the indicator to an adaptive one (RD VWAP) that automatically finds the most recent high and low pivot dates and then plots the VWAP automatically from these dates. My version of the indicator will plot automatically on any chart and the only input required is the strength (bars on each side of the pivot).

I created a function to compute the RD VWAP, shown under the heading "RD VWAP Adaptive Moving Average." This

TRADERS' TIPS

function is called to create the indicator plot, shown under the heading "RD VWAP Adaptive Indicator." This indicator plots three VWAP moving averages. The fastest VWAP average starts from the most recent swing high or swing low. The second VWAP starts from the next most recent swing high or swing low pair. The third VWAP starts from the third most recent pair of swing high or swing low. The closer of the two in each pair set is used in each case. The RD VWAP indicator is shown in Figure 9 on a chart of crude oil.

To test the indicator, I devised a simple trading system based on a trend-following technique of buying when the close crosses above the VWAP adaptive indicator. The code for this system is shown under the heading "RD VWAP Adaptive System." For this test, I used the fastest of the three lines. I ran simulations using a diversified portfolio of reverse-adjusted futures contracts consisting of cotton, euro currency, copper, Japanese yen, natural gas, sugar, and 10-year T-note. To run tests on a portfolio level, I used one of the trade plans provided with the software called the TS_PercentMarginPlan. (The code for this is not shown since it is provided with the software.) This plan bases position sizing on the margin requirements for each futures contract. I used a 10% parameter, which means that I used only 10% of the available leverage on each contract. Positions were exited on a reversing signal.

I was curious as to whether the new indicator would outperform a simple moving average crossover (SMACO) system. (The code for the SMACO system is not shown but is posted at the websites mentioned below.) I used a moving average length equal to 2 times the strength parameter of the VWAP +1. I ran comparative tests over the period 12/24/1992 to 7/11/2008 using the same portfolio of futures and the same exit conditions, with the difference being in the indicator driving the entries and exits. The results of the tests are compared in the table in Figure 10, which shows the RD VWAP adaptive system performing somewhat better than the SMACO system on all the various metrics. The long side on both systems preformed considerably better than the short side. The RD VWAP indicator appears to be worthy of further research. The stepping nature of the RD VWAP might make it an excellent trailing stop.

This code can be downloaded from the TradersStudio website at www.TradersStudio.com ->Traders Resources->FreeCode and also from www.tradersedgesystems.com/traderstips.htm.

```
' MIDAS TOUCH INDICATOR
' Author: Addrew Coles, PhD, TASC September 2008
' Coded by: Richard Denning 7/11/08

Sub MIDAS_I(date1, date2, date3, date4)
'date input format = ccyymmdd
Dim bars1,bars2,bars3,bars4,VWAP1,VWAP2,VWAP3,VWAP4 As
BarArray
Dim MP, cumPV1, cumPV2, cumPV3, cumPV4 As Double
Dim cumV1, cumV2, cumV3, cumV4 As Double
MP = (H + L) / 2
'compute and plot line starting from date1
If Date > MigrateDate(date1) Then
```

```
   bars1 = bars1[1] + 1
   cumPV1 = summ(MP * V, bars1)
   cumV1 = summ(V, bars1)
   If cumV1 > 0 Then
      VWAP1 = cumPV1 / cumV1
      plot1(VWAP1)
   End If
Else
   bars1 = 0
End If
'Compute and plot line starting from date2:
If Date > MigrateDate(date2) Then
   bars2 = bars2[1] + 1
   cumPV2 = summ(MP * V, bars2)
   cumV2 = summ(V, bars2)
   If cumV2 > 0 Then
      VWAP2 = cumPV2 / cumV2
      plot2(VWAP2)
   End If
Else
   bars2 = 0
End If
'Compute and plot line startgin from date3:
If Date > MigrateDate(date3) Then
   bars3 = bars3[1] + 1
   cumPV3 = summ(MP * V, bars3)
   cumV3 = summ(V, bars3)
   If cumV3 > 0 Then
      VWAP3 = cumPV3 / cumV3
      plot3(VWAP3)
   End If
Else
   bars3 = 0
End If
'Compute and plot line starting form date4:
If Date > MigrateDate(date4) Then
   bars4 = bars4[1] + 1
   cumPV4 = summ(MP * V, bars4)
   cumV4 = summ(V, bars4)
   If cumV4 > 0 Then
      VWAP4 = cumPV4 / cumV4
      plot4(VWAP4)
   End If
Else
   bars4 = 0
End If
End Sub
```

```
' RD VWAP ADAPTIVE MOVING AVERAGE (FUNCTION)
' Based on article by: Addrew Coles, TASC September 2008
' Author: Richard Denning
' Coded by: Richard Denning 7/12/08

Function VWAP_ADPT(strength,swBarNum)
' strength is swing high/low bar pivot strength; input as integer
'    Min value = 1, maxbarsback must be >= strength * 25
' swBarNum =1 use most recent swing high swing low bars, 2 next
etc
'    Max value = 3
Dim bars1,bars2,bars3,length As Integer
Dim swHigh1,swHigh2,swHigh3,swLow1,swLow2,swLow3 As
Integer
Dim VWAP1,VWAP2,VWAP3 As BarArray
Dim avgP, cumPV1, cumPV2, cumPV3, cumV1, cumV2, cumV3 As
Double

length = strength * 24
avgP = (H + L) / 2
swHigh1 = SwingHighBar(1, H, strength, length)
swHigh2 = SwingHighBar(2, H, strength, length)
swHigh3 = SwingHighBar(3, H, strength, length)
swLow1 = SwingLowBar(1, L, strength, length)
swLow2 = SwingLowBar(2, L, strength, length)
swLow3 = SwingLowBar(3, L, strength, length)
bars1 = Min(swHigh1,swLow1)
bars2 = Min(swHigh2,swLow2)
bars3 = Min(swHigh3,swLow3)
```

```
If bars1 > 0 And swBarNum = 1 Then
    cumPV1 = summ(avgP * V, bars1)
    cumV1 = summ(V, bars1)
    If cumV1 > 0 Then
        VWAP1 = cumPV1 / cumV1
        VWAP_ADPT = VWAP1
    End If
End If

If bars2 > 0 And swBarNum = 2 Then
    cumPV2 = summ(avgP * V, bars2)
    cumV2 = summ(V, bars2)
    If cumV2 > 0 Then
        VWAP2 = cumPV2 / cumV2
        VWAP_ADPT = VWAP2
    End If
End If

If bars3 > 0 And swBarNum = 3 Then
    cumPV3 = summ(avgP * V, bars3)
    cumV3 = summ(V, bars3)
    If cumV3 > 0 Then
        VWAP3 = cumPV3 / cumV3
        VWAP_ADPT = VWAP3
    End If
End If
End Function


' RD VWAP ADAPTIVE INDICATOR
' Based on article by: Addrew Coles, TASC September 2008
' Author: Richard Denning
' Coded by: Richard Denning 7/12/08

Sub RD_VWAP_I(strength As Integer)
' strength is swing high/low bar pivot strength; input as integer
'    Min value = 1, maxbarsback must be >= strength * 25

Dim VWAP1, VWAP2, VWAP3 As BarArray
Dim avgP As Double
VWAP1 = VWAP_ADPT(strength,1)
VWAP2 = VWAP_ADPT(strength,2)
VWAP3 = VWAP_ADPT(strength,3)

If BarNumber > 502 Then
    plot1(VWAP1)
    plot2(VWAP2)
    plot3(VWAP3)
Else
    plot1(avgP)
    plot2(avgP)
    plot3(avgP)
End If
End Sub


' RD VWAP ADAPTIVE SYSTEM
' Based on article by: Addrew Coles, TASC September 2008
' Author: Richard Denning
' Coded by: Richard Denning 7/12/08

Sub VWAP_1P(strength As Integer, swBarNum As Integer,
numXOs As Integer)
' strength is swing high/low bar pivot strength; input as integer
'    Min value = 1, maxbarsback must be >= strength * 25
' swBarNum =1 use most recent swing high swing low bars, 2 next
etc
'    Max value = 3
' numXOs = 1 use first cross over for entry and exit signal
'        = 2 require two consecutive cross overs for signals
'    Min value = 1,  Max value = 2
If strength < 1 Then strength = 1
If swBarNum < 1 Then swBarNum = 1
If swBarNum > 3 Then swBarNum = 3
If numXOs < 1 Then numXOs = 1
If numXOs > 2 Then numXOs = 2
Dim VWAP As BarArray
VWAP = VWAP_ADPT(strength,1)
```

```
If BarNumber > 575 Then
    If numXOs = 1 Then
        'Long entry rule for single XOs:
        If C > VWAP And C[1] < VWAP[1] Then
        Buy("LE_VWAP_1P",1,0,Market,Day)
        End If
        'Long exit rule for single XOs:
        If C < VWAP Then
        ExitLong("LX_VWAP_1C","",1,0,Market,Day)
        End If
        'Short entry rule for single XOs:
        If C < VWAP And C[1] > VWAP[1] Then
        Sell("SE_VWAP_1P",1,0,Market,Day)
        End If
        'Short exit rule for single XOs:
        If C > VWAP Then
        ExitShort("SX_VWAP_1C","",1,0,Market,Day)
        End If
    End If
    If numXOs = 2 Then
        'Long entry rule for two bar XOs:
        If C > VWAP And C[1] > VWAP[1] And C[2] < VWAP[2] Then
        Buy("LE_VWAP_2P",1,0,Market,Day)
        End If
        'Long exit rule for two bar XOs:
        If C < VWAP And C[1] < VWAP[1] Then
        ExitLong("LX_VWAP_2C","",1,0,Market,Day)
        End If
        'Short entry rule for two bar XOs:
        If C < VWAP And C[1] < VWAP[1] And C[2] > VWAP[2] Then
        Sell("SE_VWAP_2P",1,0,Market,Day)
        End If
        'Short exit rule for two bar XOs:
        If C > VWAP and C[1] > VWAP[1] Then
        ExitShort("SX_VWAP_2C","",1,0,Market,Day)
        End If
    End If
End If

End If
End Sub
```

—Richard Denning
richard.denning@earthlink.net

♦ NEOTICKER: MIDAS INDICATOR

In "The MIDAS Touch, Part 1" in this issue, author Andrew Coles presents the MIDAS indicator to help identify support and resistance price levels for any instrument. This indicator can be written in NeoTicker using formula language (Listing 1) with one starting date/time parameter for both the daily and intraday calculation.

We've created an indicator in NeoTicker named "TASC Formula I-Midas" with one parameter that accepts a *datetime* variable for the starting date and time of weighted average price calculation. The parameter field is set to *datetime* type. NeoTicker provides a selection user interface for entering the date and time correctly.

A sample chart is shown in Figure 11.

A downloadable version of this indicator will be available at the NeoTicker blog site (**http://blog.neoticker.com**).

LISTING 1

```
$pv := if(data1.datetime(0)>param1,
    $pv+typicalprice(data1)*v, typicalprice(data1)*v);
```

FIGURE 11: NEOTICKER, MIDAS INDICATOR

```
$denom := if(data1.datetime(0)>param1, $denom+v, v);
plot1 := if(data1.datetime(0)>param1, $pv/$denom, 0);
success1 := data1.datetime(0)>param1;
```

—Kenneth Yuen, TickQuest Inc.
www.tickquest.com

STRATASEARCH

STRATEGY DISCOVERY

✦ STRATASEARCH: MIDAS INDICATOR

Viewing the MIDAS support/resistance curves on multiple charts indicates they can be an effective approach. In fact, their success was fairly consistent from one symbol to another. However, the requirement to manually enter the starting dates for each MIDAS curve prevents the approach from being backtested very easily, so this is an approach that will likely be appreciated more by chartists than system traders.

As with all other Traders' Tips, additional information — including plug-ins — can be found in the Shared Area of the StrataSearch user forum. This month's plug-in contains a prebuilt custom formula and chart that will provide users with a template for exploring the MIDAS curves further.

A sample chart is shown in Figure 12.

```
//**********************************
// MIDAS
//**********************************
// User defined input
sm=parameter("StartingMonth");
sd=parameter("StartingDay");
sy=parameter("StartingYear");
start= (sy*10000)+(sm*100)+sd;

// mid price
pv=MP()*V;
```

FIGURE 12: STRATASEARCH, THE MIDAS INDICATOR. As suggested by author Andrew Coles, the MIDAS curves provide helpful support/resistance lines. By the time the fourth support curve is in place (third ellipse), the support is very strong.

```
// Midas calculation
denom=If(accum(V)-ValueWhen(date=start, Accum(V)) = 0, 1,
Accum(V)-ValueWhen(date=start, Accum(V)));
Midas      =      If(DaysSince(date=start),(Accum(pv)-
ValueWhen(date=start,accum(pv)))/denom,MP());
```

—Pete Rast
Avarin Systems, Inc.
www.StrataSearch.com

TS SUPPORT

✦ MULTICHARTS: MIDAS INDICATOR

This Traders' Tip for MultiCharts is based on Andrew Coles's article in this issue, "The MIDAS Touch, Part 1."

We have created MIDAS in such a way that you will not have to worry about using the code for different resolutions. The script identifies the type of the chart and is then calculated accordingly. If you do not specify the input values, then, by default, the indicator is plotted from the very beginning. If you want to choose a specific swing high or low, just enter the year, month, day, hour, and minute in the regular format. The result of applying the indicator to MultiCharts as described in the article is demonstrated in Figure 13.

```
inputs:
    year_start(0),
    month_start(1),
    day_start(1),

    hour_start(0),
    minute_start(0);

variables:
    dateStart(0),
    timeStart(0),

    cumulativeVolume(0),
    startVolume(0),

    cumulativePriceOnVolume(0),
    startPriceOnVolume(0),
```
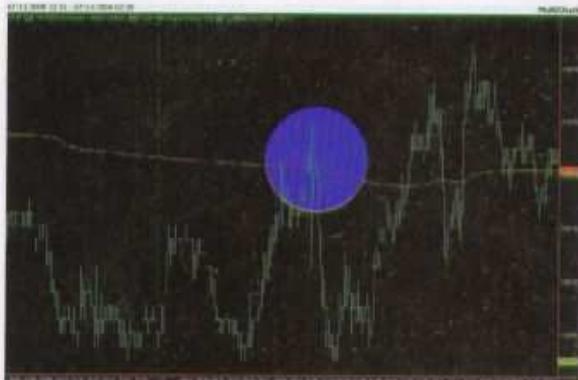
FIGURE 13: MULTICHARTS, MIDAS INDICATOR. Here is a sample chart of the emini S&P 500 continuous contract with the MIDAS indicator.

```
MP(0),

denom(0);

if ( month_start < 1 ) or ( month_start > 12 ) then
    raiseruntimeerror("Invalid Month input number. Diapason = 1..12");

if ( day_start < 1 ) or ( day_start > 31 ) then
    raiseruntimeerror("Invalid Day input number. Diapason = 1..31");

if ( hour_start < 0 ) or ( hour_start > 23 ) then
    raiseruntimeerror("Invalid Hour input number. Diapason = 1..23");

if ( minute_start < 0 ) or ( minute_start > 59 ) then
    raiseruntimeerror("Invalid Minute input number. Diapason =
1..59");

once value1 = (intportion(year_start) - 1900)*10000 +
intportion(month_start)*100 + intportion(day_start);
once value2 = intportion(hour_start)*100 + intportion(minute_start);

MP = (high + low)*.5;

cumulativeVolume += volume;
cumulativePriceOnVolume += MP*volume;

if ( bartype > 1 and bartype < 5 ) then
    condition1 = date >= value1
else
    condition1 = ( date > value1 ) or ( date = value1 ) and ( time >=
value2 );

if condition1 then
begin
    once startVolume = cumulativeVolume;
    once startPriceOnVolume = cumulativePriceOnVolume;

    if ( startVolume = cumulativeVolume ) then
            denom = 1
    else
            denom = cumulativeVolume - startVolume;

    if ( denom > 0 ) then
            value3   =   (   cumulativePriceOnVolume  -
startPriceOnVolume )/denom;

    if ( startVolume = cumulativeVolume ) then
            value3 = MP;

    plot1(value3);
end;
```


FIGURE 14: NINJATRADER, THE MIDAS INDICATOR. This NinjaTrader screenshot shows the MIDAS indicator applied on a daily chart of MSFT.

To discuss this article or download a complete copy of the formulas, please visit our discussion forum at **forum.tssupport.com**.

—Stanley Miller
TS SUPPORT, LLC
www.tssupport.com

NINJA ◆ TRADER

✦ NINJATRADER: MIDAS INDICATOR

The MIDAS and I-MIDAS indicators, as discussed in "Examining The VWAP Approach: The MIDAS Touch, Part 1" by Andrew Coles in this issue, are available for download at www.ninjatrader.com/SC/September2008SC.zip.

Once it has been downloaded, from within the NinjaTrader Control Center window, select the menu File > Utilities > Import NinjaScript and select the downloaded file. These indicators are for NinjaTrader version 6.5 or greater.

A sample chart is shown in Figure 14.

You can review the indicator's source code by selecting the menu Tools > Edit NinjaScript > Indicator from within the NinjaTrader Control Center window and selecting either "MIDAS" or "I_MIDAS."

NinjaScript indicators are compiled DLLs that run native, not interpreted, to provide the highest performance possible.

—Raymond Deux, NinjaTrader, LLC
www.ninjatrader.com

CMS FOREX
www.cmsfx.com

✦ VT TRADER: MIDAS INDICATOR

This Traders' Tip was inspired by the article "Examining The VWAP Approach: The MIDAS Touch, Part 1" by Andrew

Coles in this issue. The VWAP support and resistance indicator (also known as the "MIDAS" indicator) was created by the late Paul Levine. The main goal of the MIDAS indicator is the prediction of major trend reversals using nonlinear support and resistance curves. The original MIDAS indicator was designed for use on long-term daily charts, but it has since been adapted for use on intraday charts.

We'll be offering two versions of the MIDAS indicator for download in our user forums: "MIDAS" is for use on the daily chart interval, while "I-Midas" is for use on the intraday chart intervals.

The VT Trader code and instructions for creating both versions of the MIDAS indicator are as follows:

The Midas Indicator

1. Navigator Window>Tools>Indicator Builder>[New] button

2. In the Indicator Bookmark, type the following text for each field:

Name: TASC - 09/2008 - Midas
Short Name: vt_Midas
Label Mask: TASC - 09/2008 - Midas (Start Date: %sm%/%sd%/%sy%)
Placement: Price Frame
Inspect Alias: Midas

3. In the Input Bookmark, create the following variables:

[New] button... Name: sm , Display Name: Starting Month , Type: integer (with bounds) , Default: 1, Min Bounds: 1, Max Bounds: 12
[New] button... Name: sd , Display Name: Starting Day , Type: integer (with bounds) , Default: 1, Min Bounds: 1, Max Bounds: 31
[New] button... Name: sy , Display Name: Starting Year , Type: integer (with bounds) , Default: 2008

4. In the Output Bookmark, create the following variables:

[New] button...
Var Name: Midas
Name: (Midas)
Line Color: dark green
Line Width: slightly thicker
Line Type: solid

5. In the Formula Bookmark, copy and paste the following formula:

```
{Provided By: Visual Trading Systems, LLC & Capital Market
Services, LLC (c) Copyright 2008}
{Description: The Midas Indicator}
{Notes: T.A.S.C., September 2008 - "The Midas Touch" by Andrew
Coles, PhD}
{vt_Midas Version 1.0}

start:= sd=DayOfMonth() AND sm=Month() AND sy=Year();
pv:= MP() * V;
denom:= If(ValueWhen(1,start,Cum(V))=0,  1,  Cum(V) -
ValueWhen(1,start,Cum(V)));
midas:= (Cum(pv) - ValueWhen(1,start,Cum(pv))) / denom;
```

6. Click the "Save" icon to finish building the MIDAS indicator.

To attach the indicator to a chart (Figure 15), click the right mouse button within the chart window and then select "Add Indicator" -> "TASC - 09/2008 – Midas" from the indicator list.
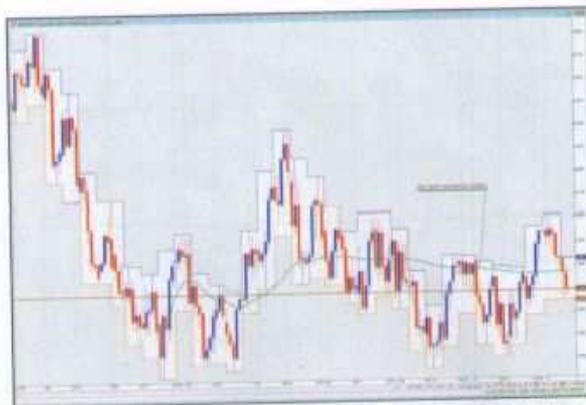
FIGURE 15: VT TRADER, THE MIDAS INDICATOR. Here is the MIDAS indicator on a daily chart.

FIGURE 16: VT TRADER, THE MIDAS INDICATOR. Here is the MIDAS indicator on a GBP/USD 10-minute candlestick chart.

The I-Midas Indicator

1. Navigator Window>Tools>Indicator Builder>[New] button

2. In the Indicator Bookmark, type the following text for each field:

Name: TASC - 09/2008 – I-Midas
Short Name: vt_I_Midas
Label Mask: TASC - 09/2008 - I-Midas (Start Date/Time: %sm%/%sd%/%sy% %sh%:%se%)
Placement: Price Frame
Inspect Alias: I-Midas

3. In the Input Bookmark, create the following variables:

[New] button... Name: sm , Display Name: Starting Month , Type: integer (with bounds) , Default: 1, Min Bounds: 1, Max Bounds: 12
[New] button... Name: sd , Display Name: Starting Day , Type: integer (with bounds) , Default: 1, Min Bounds: 1 , Max Bounds: 31
[New] button... Name: sy , Display Name: Starting Year , Type: integer (with bounds) , Default: 2008
[New] button... Name: sh , Display Name: Starting Hour , Type: integer (with bounds) , Default: 1, Min Bounds: 0 , Max Bounds: 23
[New] button... Name: se , Display Name: Starting Minute , Type: integer (with bounds) , Default: 0 , Min Bounds: 0 , Max Bounds: 59

4. In the Output Bookmark, create the following variables:

[New] button...
Var Name: I-Midas
Name: (I-Midas)
Line Color: dark blue
Line Width: slightly thicker
Line Type: solid

5. In the Formula Bookmark, copy and paste the following formula:

{Provided By: Visual Trading Systems, LLC & Capital Market Services, LLC (c) Copyright 2008}
{Description: The I-Midas Indicator}
{Notes: T.A.S.C., September 2008 - "The Midas Touch" by Andrew Coles, PhD}
{vt_I_Midas Version 1.0}

```
start:= sd=DayOfMonth() AND sm=Month() AND sy=Year() AND
sh=Hour() AND se=Minute();
pv:= MP() * V;
denom:= If(ValueWhen(1,start,Cum(V))=0, 1, Cum(V) -
ValueWhen(1,start,Cum(V)));
i_midas:= (Cum(pv) - ValueWhen(1,start,Cum(pv))) / denom;
```

6. Click the "Save" icon to finish building the I-Midas indicator.

To attach the indicator to a chart (Figure 16), click the right mouse button within the chart window and then select "Add Indicator" -> "TASC - 09/2008 – I-Midas" from the indicator list.

To learn more about VT Trader, visit **www.cmsfx.com**.
—*Chris Skidmore*
Visual Trading Systems, LLC (courtesy of CMS Forex)
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www.cmsfx.com

INVESTOR/RT: MIDAS INDICATOR

The Investor/RT implementation of the VWAP cumulative bands indicator provides an option to create cumulative VWAP lines originating at any user-specified date/time and continuing to the present, as demonstrated in Figure 17.

The dark blue lines show the cumulative VWAP, while the light blue lines represent 1 standard deviation bands above and below the VWAP.
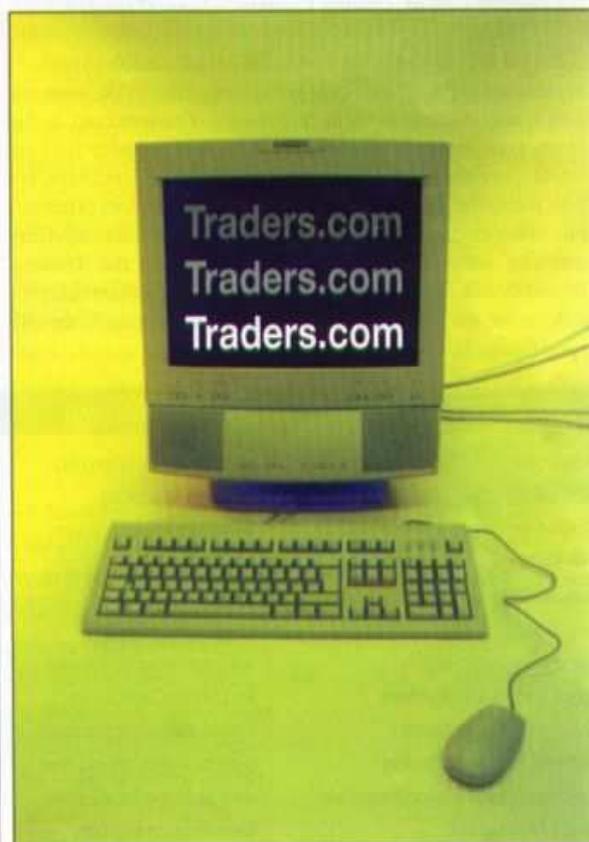
These cumulative VWAP lines should be drawn from bars with extreme highs or lows and provide lines of resistance and support, respectively. These lines may be easily dragged and dropped to a new starting date/time, or they may be cloned by simply ctrl-dragging to any bar with an extreme relative high or low.

More information on the Investor/RT implementation of the VWAP indicator, along with video demonstrations, may be found at: http://www.linnsoft.com/tour/techind/vwap.htm.
—*Chad Payne*
Linn Software
www.linnsoft.com, info@linnsoft.com

FIGURE 17: INVESTOR/RT, VOLUME-WEIGHTED AVERAGE PRICE INDICATOR. A daily chart of the S&P emini shows cumulative VWAP lines from key highs. These lines are drawn along with 1 standard deviation bands and can be used for areas of resistance.

S&C