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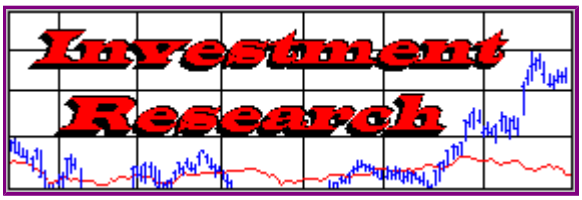


# Introducing the MIDAS Method of Technical Analysis (9) by Paul Levine

This is the nineth article in a series. Click here to go to the **first**, **second**, **third**, **fourth**, **fifth**, **sixth**, **seventh**, or **eighthth** article.

**The previous two articles have described how one computes the hierarchy of theoretical support/ resistance (S/R) levels upon which the MIDAS method of technical analysis is based.** This description has intentionally avoided mathematical detail in order to focus on the conceptual foundations. We now turn to the actual equations and show how they can be readily evaluated in a spreadsheet.

**Suppose the input data spans a consecutive period of N days.** On any given day, say the i-th, we denote the high, low and volume as H(i), L(i) and V(i) respectively. These are the data that are actually used by MIDAS; we do not require the open, close or calendar date. (If the available input data only gives a single price - the close for example - then simply set the high and low equal to this price; if volume data is not available, set the volume for every day equal to the same value - say one share. Having less than complete input data is less than ideal but not a fatal drawback).

**The first step is to compute for each day the average price P(i):**

$$P(i) = .5*( H(i) + L(i) )$$

**Next, compute the cumulative volume for the i-th day, cumvol(i):**

$$cumvol(i) = cumvol(i-1) + V(i)$$

**That is we simply add the new day's volume to the cumulative volume at the previous day.** To start this process, we set the cumulative volume initially to zero so that at the end of the first day cumvol(1) = V(1).

**In a similar fashion, also compute the cumulative product of the daily price and daily volume.** Calling this cumpvol(i), we have

$$cumpvol(i) = cumpvol(i-1) + P(i)*V(i)$$

**Again we start cumpvol at zero, so that at the end of the first day cumpvol(1) = P(1)*V(1).**

**Finally, the on-balance volume for the i-th day, obv(i), is computed from the equation**

$$obv(i) = obv(i-1) +sgn(i)*V(i)$$

**where the "sign" function, sgn(i), is defined by**

$$sgn(i) = +1 \text{ if } P(i) > P(i-1)$$

**sgn(i) = -1 if P(i) < P(i-1)**

**sgn(i) = 0 if P(i) = P(i-1)**

**We arbitrarily choose sgn(1)=1 on the first day so that obv(1)=V(1).**

**The MIDAS chart is then constructed by plotting two separate (i.e. non-overlapping) graphs, one placed vertically above the other so that their x-axes are parallel.** In the upper graph, plot P(i) as the y- coordinate versus cumvol(i) as the x coordinate. In the lower graph, use the same x coordinate (i.e. cumvol(i) ) and plot obv(i) as the y coordinate. Thus every day gives rise to a single x-y point in each of the two graphs. Connecting the sequential points in each graph thereby traces out curves of price vs. cumulative volume in the upper graph and on-balance volume vs. cumulative volume in the lower graph.

**The last step is to plot the theoretical S/R curves on the same graph that has price vs.** cumulative volume. The equation for computing the value on the i-th day of an S/R level "launched" on the j-th day ( call this S/R(i , j) is simply:

**S/R(i , j) = ( cumpvol(i) - cumpvol(j) ) / ( cumvol(i) - cumvol(j) )**

**That's all there is to it!** One just interactively chooses a set of launch points until an S/R hierarchy is (hopefully) found which makes sense of the historical data, the initial launch point guesses being the days of observed reversals in trend.

**An easy way of carrying out these calculations in practice is through the use of a spreadsheet.** Below I show how this could be done in Lotus 123 (other spreadsheets will be similar if not identical).

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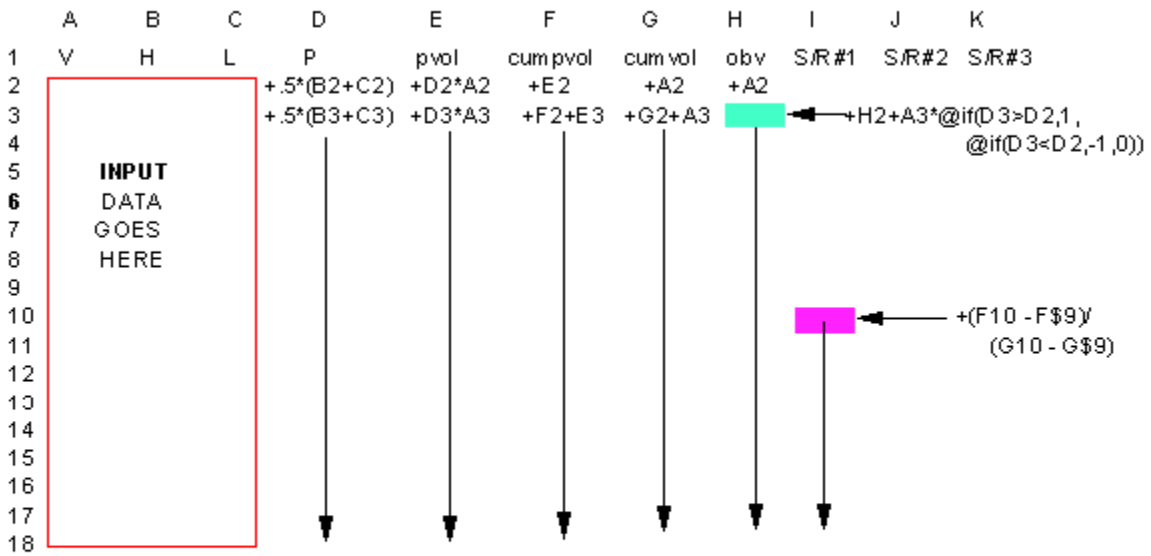
## LOTUS 123 SPREADSHEET FOR MIDAS




*(COPY cell formulas to end of data block)*

**Simply enter the input data in the first three columns starting with the second row, and enter the cell formulas as shown in rows two and three.** COPY the third row downward for as many days (rows) as there are input data. If an S/R level is to be launched from a given row - say the 9-th - (e.g. because the value in the "P" column reached a local maximum or minimum at that row) then in the very next row (row 10) enter the following formula in column I (the one labelled S/R#1):

**+(F10 - F$9)/(G10 - G$9)**

**COPY it downwards to the last row of the data set.** Note that the $ is very important since it "anchors" the S/R level to the launch point (row 9 in the current example). Additional S/R levels can be similarly launched in columns J, K, etc. as the occasion demands.

**Finally, using the graphing capabilities of the spreadsheet, create a pair of x-y type graphs.** In both graphs, choose the x coordinate as the "cumvol" column (G in the present example). In one of the graphs, the price vs. cumvol curve is generated by taking the y coordinate from the "P" column (column D ) and the S/R curve(s) from columns I (et al). In the other graph, take the y coordinate from the "obv" column (column H in the figure).

**From a practical standpoint, the time-consuming element is loading the input data into the first three columns.** Those who are already using a spreadsheet to perform technical analyses will presumably have automated this process so the addition of MIDAS should present no difficulties. Others may be using a commercially available charting software package which both imports historical data automatically and allows for user-defined custom formulae or "indicators". In the next article I will show how MIDAS can be integrated into one such package.

# POSTSCRIPT:

**We are now approximately at the "midterm" of what I view as a course here at Cybercollege, one in which you have enrolled by sticking with the articles to this point.** Your midterm "exam" is simply to provide me with some feedback: what you like and dislike about the articles, any points you found unclear or particularly enlightening, and in general any comments which may assist me in making the remainder of the course as useful as possible to you. On a personal level, a brief biographical paragraph would also assist me in visualizing the faces on the other side of my modem... Thanks.

**Submit your midterm to Paul Levine: WinMidas website">winmidas@winmidas.com or visit the WinMidas website**

**Return to Investment Research**

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**Paul Levine** first became interested in technical analysis when he was a "runner" on Wall Street as a high school student. After graduating from MIT and gaining a PhD in theoretical physics from CalTech, he took a fresh look at the problem some thirty years ago and stumbled upon what has now evolved into the Midas method. Following retirement as Chief Scientist and a co-founder of Megatek Corporation in 1981, he developed further elaborations of the method and is now in his fourth year as a professional trader. He can be reached via e-mail at **WinMidas website**">winmidas@winmidas.com or visit the WinMidas website.

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