Nani Desu Ka?*

Using The Heikin-Ashi Technique

Enter and stay on the right side of the trend — or when in doubt, stay out — with this Japanese charting technique.

Since the introduction of the candlestick method to the US some two decades ago, it caused a revolution in perceiving how the bullish and bearish forces perform in the Western markets. It has become a popular charting tool, as traders have used candlesticks to make chart formations easier to spot and name. But interpreting candlesticks can be challenging. To make things easier, the *heikin-ashi* technique modifies the traditional candlestick chart. Let's take a look at how it works.

BALANCING ON ONE FOOT
The heikin-ashi method *{heikin* means "average" or "balance" in Japanese, while *ashi* means "foot" or "bar") is a visual technique that eliminates irregularities from a normal chart, offering a better picture of trends and consolidations. Just by looking at a candlestick chart created with this method, you get a good idea of the market's status and its strength. Take a look at the candlestick chart of Canon ADR in Figure 1A versus the heikin-ashi modified chart in Figure 1B. Which chart would you prefer to use?

CALCULATION
The heikin-ashi candlestick technique uses modified open-high-low-close (OHLC) values and displays them as candlesticks. The modified values are computed using these definitions:

- haClose $= (O+H+L+C)/4$
- haOpen = (haOpen (previous bar) + haClose (previous bar))/2
- haHigh = Maximum(H, haOpen, haClose)
- haLow = Minimum(L, haOpen, haClose)

The "open," "high," "low," and "close" referred to are of the current bar. The prefix *ha-* indicates the corresponding heikin-ashi modified values. I have used daily data throughout this article, so one bar represents one trading day. Depending on the trading time frame, you may employ other data, such as intraday, weekly, or monthly.

The value *haOpen* is always set to the midpoint of the body of the previous bar, while *haClose* is computed as the average price of the current bar. The modified high, *haHigh,* is chosen as the highest value of the set {real high (H), modified open (haOpen), and modified close (haClose)}. The same logic applies to the definition of the modified low: It is the lowest value in the set {real low (L), modified open (haOpen), and modified close (haClose)}.

The first sidebar, "Heikin-Ashi OHLC Values," details how to compute heikin-ashi values using Excel.

APPLYING IT
Looking at charts is the best way to understand the main features of the heikin-ashi technique. If the haClose is above haOpen, then a bullish sign occurs (white candle). If haClose is below haOpen, then a bearish sign appears (black candle).

*Editor's note: This phrase is Japanese for "What is it?"

*by **Dan Valcu***

FIGURE 1 A: DAILY CHART OF CANON. This is the traditional candlestick chart of Canon.
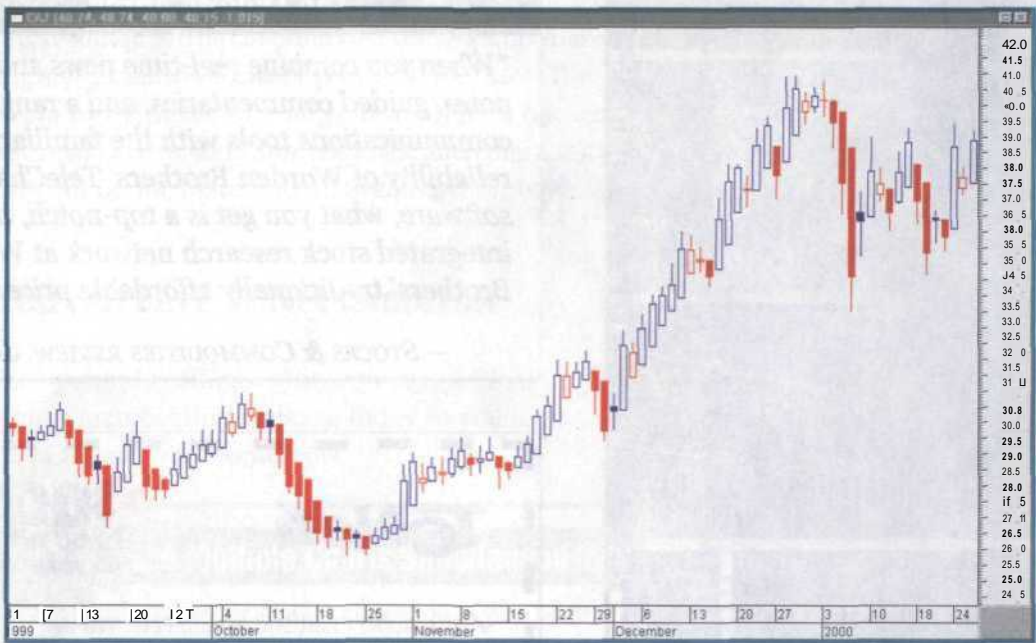
FIGURE I B: DAILY MODIFIED CHART OF CANON. The heikin ashi technique works as a filter, eliminating irregularities and making the chart smoother with well defined trends.

At first glance, Figure 1 shows that the heikin ashi chart looks more compact and smooth compared to the traditional chart. White candles display a rising trend, while black candles indicate a downtrend. Gaps, which occur frequently on the traditional OHLC chart, are not present because they are incor porated into the modified candles. Strong positive trends have long white bodies with no lower shadows, while strong nega tive trends have long black bodies with no upper shadows.

When bodies become shorter, a weaker trend is anticipated (see mid October and end of December). In the beginning of November, Canon weakened its uptrend and started a consoli dation period with several small bodies with both long upper and lower shadows. A very small body with tall shadows on the first trading day in 2000 warned about a possible change of the rising trend. As consolidations contain several bodies with tall

shadows, it is not safe to assume that the presence of a small body with tall shadows will indicate a change in trend. Figure 2 summarizes the five scenarios that can be identified on a heikin ashi candle chart.

EXAMPLES

To give you an idea of how to apply the heikin ashi charting technique, I will show you three examples using the Standard & Poor's 500 index (SP500 HA), the price of gold (XGLD HA), and Pfizer (PFE HA). The heikin ashi OHLC values were calculated as indicated in the sidebar and plotted. Each chart contains two candlestick subcharts: The top contains the modi fied OHLC values, while the bottom has the real values. Each number in the table in Figure 2 (1 to 5) applies to the chart whenever a relevant scenario appears. They are labeled in

different colors to differentiate descending and ascending trends. For each chart I'll discuss how this technique can be used to either enter and stay on the right side of the trend, or avoid trading during periods of consolidations.

Standard & Poor's 500 (SP500-HA):

Figure 3 offers no doubt about the usefulness of this method, even for a novice: All trends are visible, with short consoli-

SCENARIO	TREND BEHAVIOR	CURRENT TREND	
		ASCENDING	**DESCENDING**
1	Trend is normal	Rising white bodies	Falling filled bodies
2	Trend gets stronger	Rising longer white bodies with no lower shadows	Falling longer filled bodies with no upper shadows
3	Trend gets weaker	Candle bodies get smaller; emergence of lower shadows	Candle bodies get smaller Emergence of upper shadows
4	Consolidation	Smaller bodies with both upper and lower shadows	Smaller bodies with both upper and lower shadows
5	Change of trend	Very small body with long upper and lower shadows (not too reliable)	Very small body with long upper and lower shadows (not too reliable)

FIGURE 2: FIVE SCENARIOS OF HEIKIN-ASHI CHARTS. Here you see the different types of trend behavior for ascending and descending trends.

dations marked as (4) occurring in February and July. Strong rising trends (2) were marked by long white candle bodies with no lower shadows, while strong falling trends (2) were accompanied by filled candle bodies with no upper shadows.

Using the observations in Figure 2, note how the smaller bodies (3) in January 2003 warned about a weakening of the trend, and subsequently, a reversal (4). Trend changes (5) were pointed out by small bodies with longer shadows, but as an exception, the reversal in March occurred without any such sign. Although a rising trend, the segment AB was composed

of several short sections (normal trend, weakening, consolidation). It could also be seen as a normal ascending trend (1) due to a majority of white bodies.

The heikin-ashi is a visual technique that eliminates irregularities from a normal chart, offering a better picture of trends and consolidations.
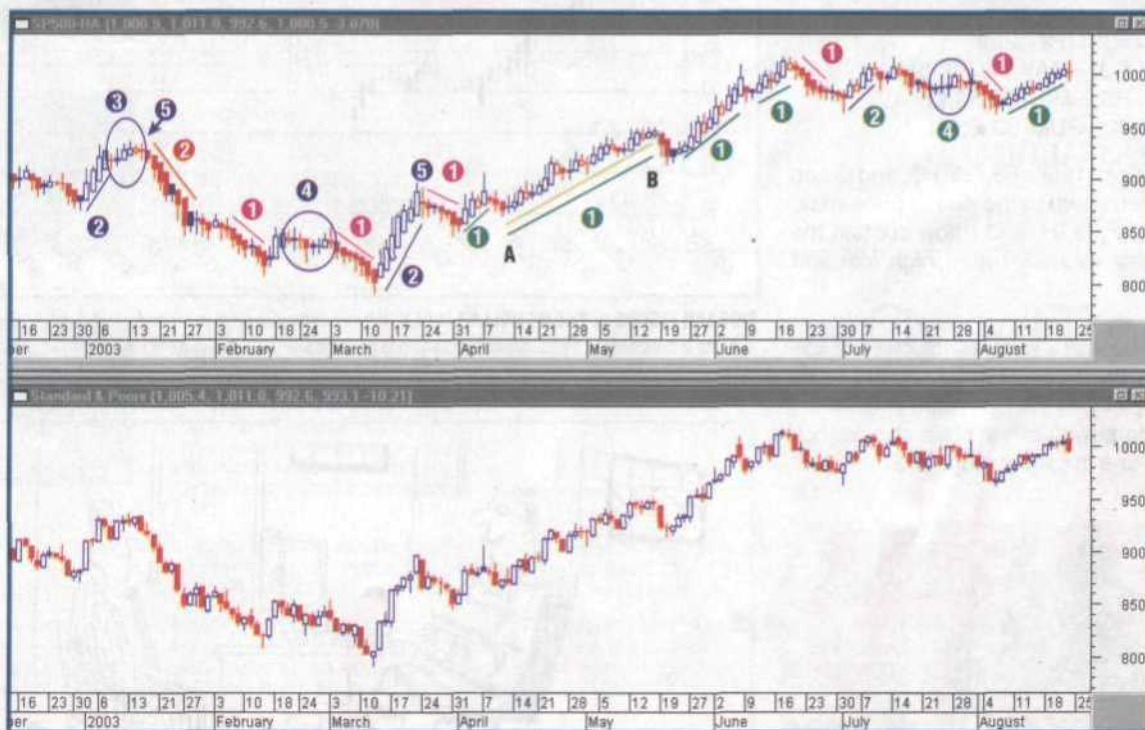
FIGURE 3: S&P 500 MODIFIED. All trends are well-defined by sequences of white or red bodies, making them easy to identify and follow.
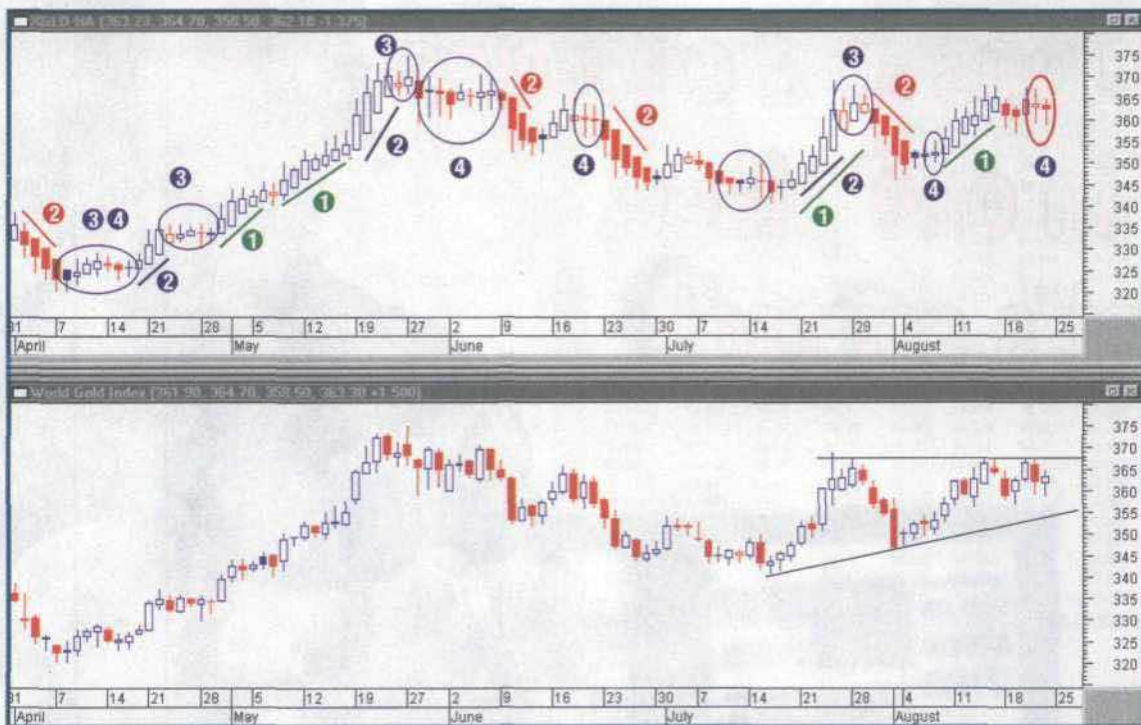
FIGURE 4: MODIFIED CHART OF **GOLD PRICES.** White bodies dominate in rising trends. Pullbacks are short and strong, marked by longer red bodies.

Gold (XGLD HA):

Another example of the simplicity gained by using modified heikin ashi values is in the chart of gold prices in Figure 4. A longer rising trend (April May) was dominated by white candles (1) and (2) with a small consolidation (4) toward the end of April.

The very small body in May was just a pause before the next leg up; most of the candles were white bodies with no lower shadows. The smaller bodies toward the end of May announced either a weakening of the trend (3) or the start of a consolidation period (4). The consolidation in May June was well defined
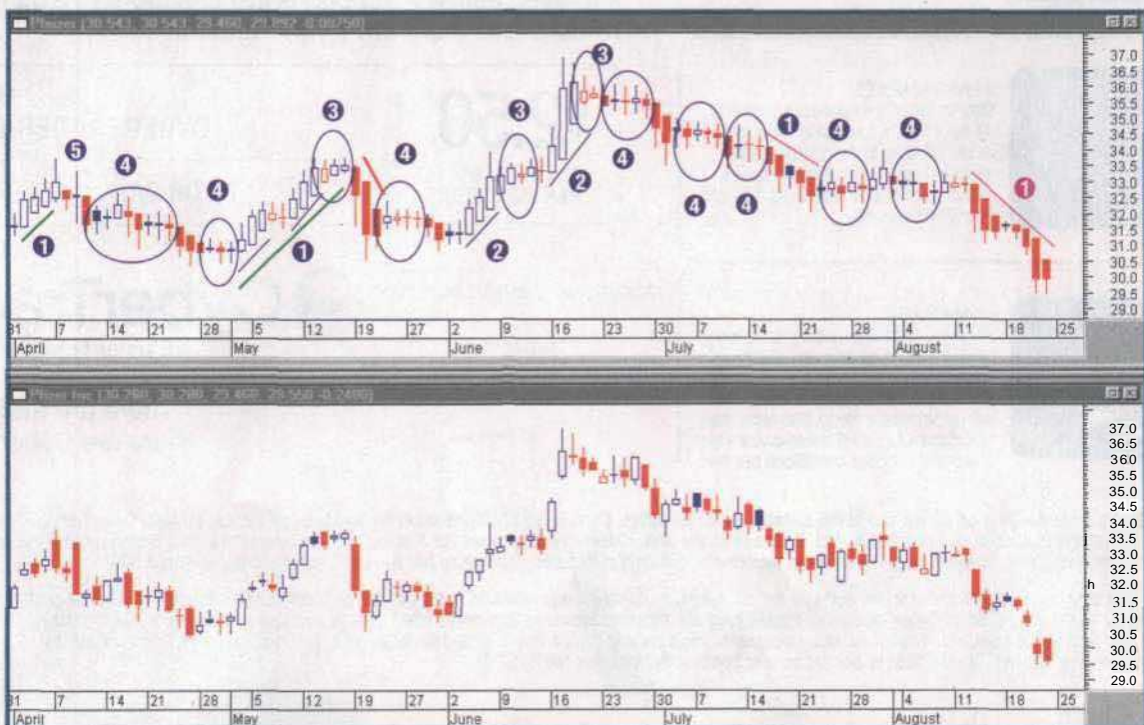
FIGURE 5: MODIFIED CHART **OF PFIZER.** In an uptrend or downtrend, Pfizer displays several small consolidation periods marked by the presence of small bodies with upper and lower shadows.

(small bodies with both long upper and lower shadows). In August, there was another consolidation (4). Given the presence of an ascending triangle, there was a very good chance that price would break out of this short consolidation.

Pfizer (PFE-HA):
If you have been trading Pfizer (PFE), you should be familiar with its behavior, which is highlighted in both charts in Figure 5: many small consolidations on the way both up and down. Gaps are not shown on the modified chart, which makes it easier to read. The small body with long upper and lower shadows (5) confirms a change of trend in April. As shown on the daily chart, the longer trends are not continuous (as in the previous examples), but interrupted by small consolidations. In this case, it would be worthwhile to analyze weekly charts.

HEIKIN-ASHI AND SIMPLE INDICATORS
From a visual standpoint, the heikin-ashi technique is based on the effect of the size and color of the candle bodies. For additional confirmation, many traders use indicators, so to make life easier I defined two simple indicators: haOpen and haClose. I applied these to the chart of Ultimate Software Group (ULTI). See the second sidebar, "Defining Simple Indicators Based On Modified OHLC Values," for details on these indicators. You can see them in a separate window in

For more information, visit the S&C ad index at **Traders.com/reader**
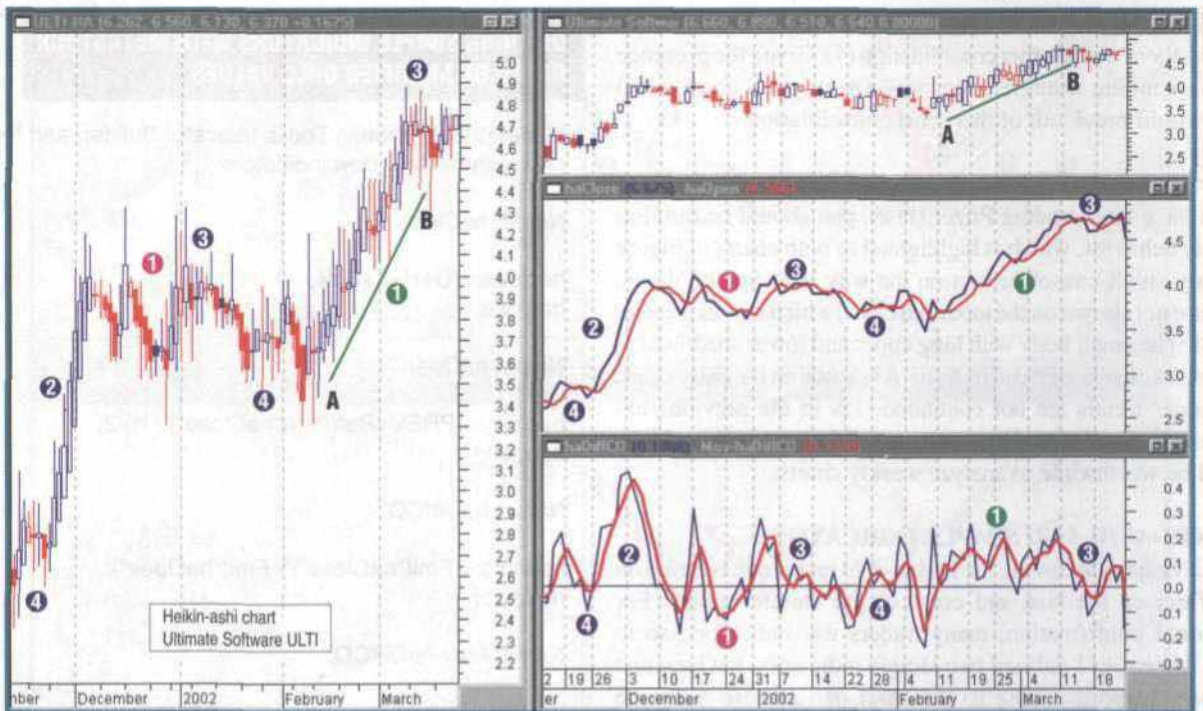
FIGURE 6: MODIFIED CHART OF ULTIMATE SOFTWARE. The transition from candle bodies to indicators is easy using the haDiffCO indicator. A short moving average helps improve timing for entries and exits.

Figure 6. In these indicators, long bodies correspond to large differences between the modified close and open (2). Small bodies (3) represent these two indicators getting closer, and mean either the start of a consolidation (4) or a possible change of trend. Between February and March 2002 (trend AB), the stock was in an uptrend, but the modified chart ULTI-HA records this as a series of white candles with both lower and upper shadows (4). This is an exception.

I created another simple indicator, haDiffCO, which is displayed in a separate subchart. Positive values correspond to white bodies (ascending trends), while negative values indicate downtrends. In addition, you can apply a shorter moving average (Mov-haDiffCo) to this indicator, and observe that:

- Crossings will point, with good accuracy, to changes in the trend. Unfortunately, the whipsaws may eliminate some good trades.

- Positive values of Mov-haDiffCo indicate an uptrend, while Mov-haDiffCo values below zero show a downtrend.

Both of these indicators are also discussed in the sidebar.
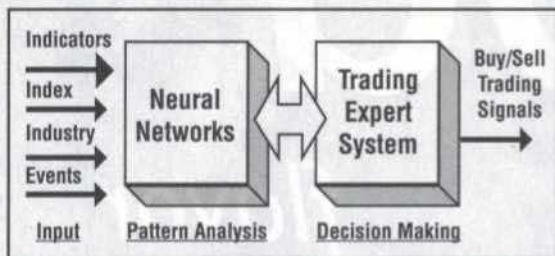
Another interesting feature is the anticipation of a change in the strength of the next trading bar. Assume you are at the end of today's trading session. Based on the calculation of haOpen:

$$haOpen (tomorrow) = (haOpen(today) + haClose(today))/2 \qquad (A)$$

The position of haClose(tomorrow) versus haOpen(tomorrow) will determine the color of the candle body:

$$\text{If haClose(tomorrow)} > \text{haOpen(tomorrow)} \qquad (B)$$
$$\qquad \text{Body (tomorrow) = white}$$
$$\text{Else}$$
$$\qquad \text{Body (tomorrow) = filled/red}$$
$$\text{Endif}$$

SUMMARY

The heikin-ashi charting technique is a visual, less subjective method for displaying trending and consolidation periods. The color of the modified candlesticks indicates the nature of the trend: A series of white bodies shows an ascending trend, while a sequence of black candle bodies is associated with a downtrend. The size of the candlestick body indicates the strength of the current trend: Long white bodies show a strong ascending trend and long black bodies are associated with stronger downtrends.

In an ascending trend, the emergence of the lower shadow suggests weakening, although an exception was highlighted in Figure 6. In a falling trend, the presence of upper shadows suggests weakening. Periods of consolidation are characterized by a sequence of smaller white and black bodies with longer upper and lower shadows. In some cases, the emergence of a candle with a small body and long shadows suggests an imminent change of trend (for an exception, see the reversal in March 2003, Figure 3). If the visual element is not sufficient, simple indicators can be used to arrive at similar conclusions.

The main advantage of this simple method is a better visual perspective of the current status and strength of the trend or consolidation, and a possible anticipation of the next bar's strength. As with any other charting method, the heikin-ashi is not 100% reliable and therefore should be combined with other technical indicators. Your trading, of course, should also include risk- and capital-control strategies.

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SUGGESTED READING
Forex Watcher: http://plaza4.mbn.or.jp/~skoike/top_eng.htm
Nison, Steve [1994]. *Beyond Candlesticks: New Japanese Charting Techniques Revealed,* John Wiley & Sons.
  MetaStock (Equis International)
Worden Brothers (TC2000)(data)

See our Traders' Tips section beginning on page 96 of this issue for various program code implementing Dan Valcu's techniques.

See Traders' Glossary for definition
See Editorial Resource Index

"..And please, please, please give me the chance to prove to you that winning the lottery won't spoil me..."

EDGAR ARGO

HEIKIN ASHI OHLC VALUES

To illustrate the calculation of heikin ashi OHLC values in a spreadsheet (sidebar Figure 1), I used daily data for the US Dollar Index (4/24/03 8/22/03). You can use intraday, weekly, or any other time frame for the data.

To build the data table and the chart associated with it, follow these steps:

Step 1: Copy daily data (date, open, high, low, close) into columns A, B, C, D, and E, through to the last column.

Step 2: Reserve columns F, G, H, and I as heikin ashi values for modified open, high, low, and close: haOpen, haHigh, haLow, haClose.

Step 3: Enter the following formulas corresponding to the first day in the data table:

In cell F2: =B2
In cell G2:=MAX(C2,F2,I2)
In cell H2: =MIN(D2,F2,I2)
In cell I2: =SUM(B2:E2)/4

Observe that cell F2 contains the value for the real open for day 1.

You also have the option to enter zero in cell F2 and MIN(D2,I2) in cell H2. But in this case the range used to display the chart will be the date for the x axis, and haOpen, haHigh, haLow, and haClose for the   axis.

Step 4: Enter the following formulas:

In cell F3: =(F2+I2)/2
In cell G3: =MAX(C3,F3,I3)
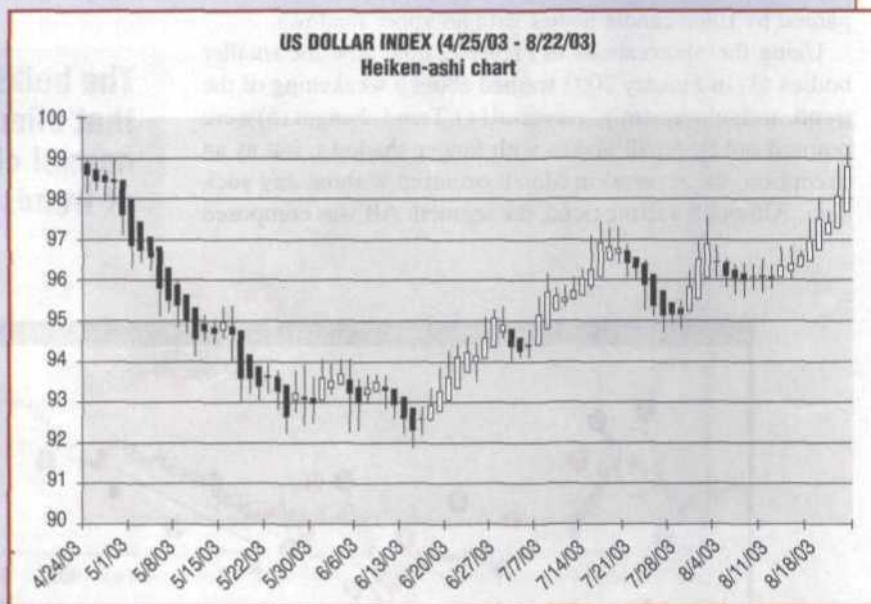In cell H3: =MIN(D3,F3,I3)
In cell I3: =SUM(B3:E3)/4

Step 5: Select cells F3, G3, H3, and I3 and copy them down to the end of price data. Columns F, G, H, and I now contain the heikin ashi values for open, high, low, and close.

Step 6: Create a candlestick chart in Ex cel using the date (column A) for the xaxis and range F2 to the last value in column I as the data range. The chart should look like the one in sidebar Figure 2.

—DV

SIDEBAR FIGURE 1: CALCULATING HEIKIN ASHI USING A SPREADSHEET

SIDEBAR FIGURE 2: THE US DOLLAR INDEX. White candles show an ascending trend, while black candles indicate a descending trend. Smaller bodies are an indication that the current trend may weaken or that the index is consolidating.

"I'M ALBERT MOONEY, YOUR TEMP BROKER, AND I'M ON A WORK RELEASE PROGRAM OUTA ATTICA."