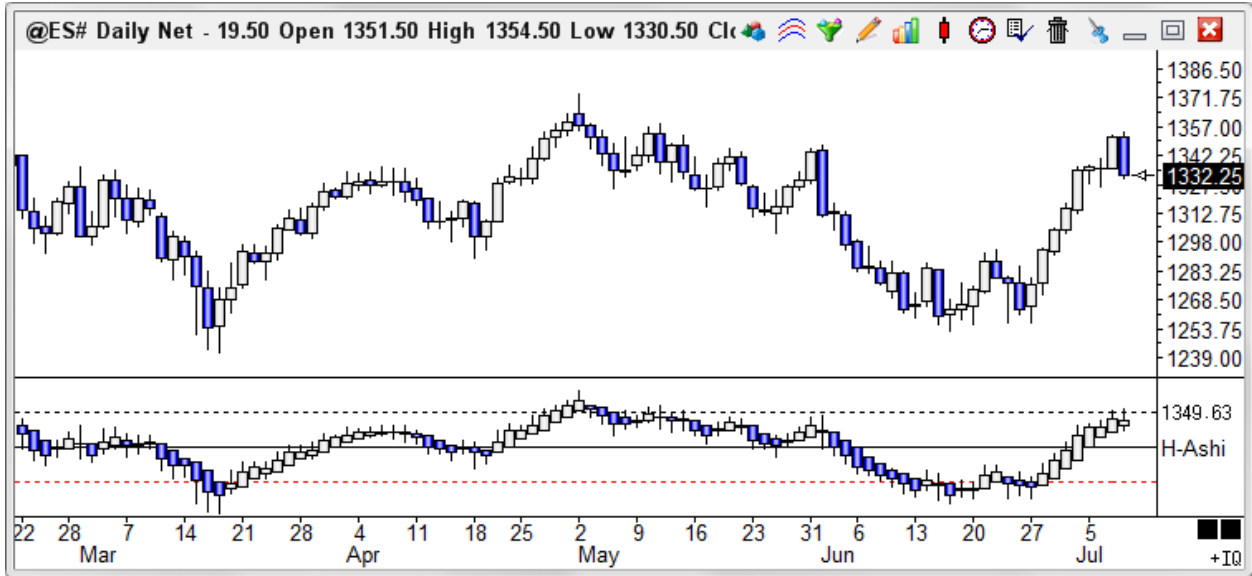


Heikin-Ashi

The Heikin-Ashi study is an average bar study. In Japanese 'Heikin' means 'Average', and 'Ashi' means 'Bar'. Some averaging formulas are used to generate a Heikin-Ashi Open, High, Low, and Close price for each bar. These prices can then be plotted as Candlesticks, Bars, or Lines. The study will mirror the bar type that a chart's main bars are formatted for. For example, if the main bars on a chart are in a Candlestick format, then the Heikin-Ashi study will display as Candles.



Properties

Place a check mark in the High Line, Close Line, Low Line, and Show Bars check boxes to optionally plot the specified line. Select Colors, Line Styles, Markers, and Marker Colors from the color boxes and drop-down list boxes. If the Heikin-Ashi study is plotted as a Candle, then the colors and Candle style will mirror the Candlestick settings from the Set-Up | Charts Candlestick screen.

Formula

$$haOpen = (haOpen \text{ of Previous bar} + haClose \text{ of Previous bar}) / 2$$

$$haClose = (Open + High + Low + Close) / 4$$

haHigh = The highest price of either the High or the haOpen

haLow = The lowest price of either the Low or the haOpen

In-Depth

The February 2004 issue of 'Technical Analysis of Stocks and Commodities' magazine contains an article by Dan Valcu titled 'Using The Heikin-Ashi Technique'. Too often traders hear about a technique and think the 'holy grail' train is leaving the station and they rush to get on board without taking time to understand what it is all about. The purpose of this article is to comment in greater detail on the visual presentation created by the mathematics of the method.

Mr. Valcu says that 'heikin' in Japanese means 'average' and 'ashi' means 'bar'. So a literal translation would be 'average bar'. Indeed, the method employs an averaging technique as shown by the formula.

Now for those who have pulled out the Valcu article and compared his formulas with those given above, please do not be too quick to claim that I made a mistake in implementing the formulas. My formulas are equivalent and it represents one of the criticisms I have.

haHigh, haLow

Mr. Valcu's formulas in the article were give as:

- $haHigh = \text{Maximum}(\text{High}, haOpen, haClose)$
- $haLow = \text{Minimum}(\text{Low}, haOpen, haClose)$

It is mathematically *impossible* for the haClose to be higher than the bar High, or lower than the bar Low. haClose is an average of the bar's open, high, low and close. The open must be in the high-low range. The close must be in the high-low range. The low must be equal to or lower than the high. Therefore, the haClose can never be higher than the High, nor lower than the Low.

Because the haClose can never be higher than the High, the Heikin-Ashi High does not need to test for the haClose as a possible price that would set haHigh. Choosing the higher of High and haOpen is sufficient. The same reasoning applies to picking a price for the Heikin-Ashi Low. Choosing the lower of Low and haOpen is sufficient. haLow does not need to consider haClose because haClose will never be lower than the Low.

I consider it unfortunate that Mr. Valcu did not understand these principles before he published his article. And, every programmer who published script code to implement Heikin-Ashi in their charting package used the Valcu formulas with scripts similar to this example:

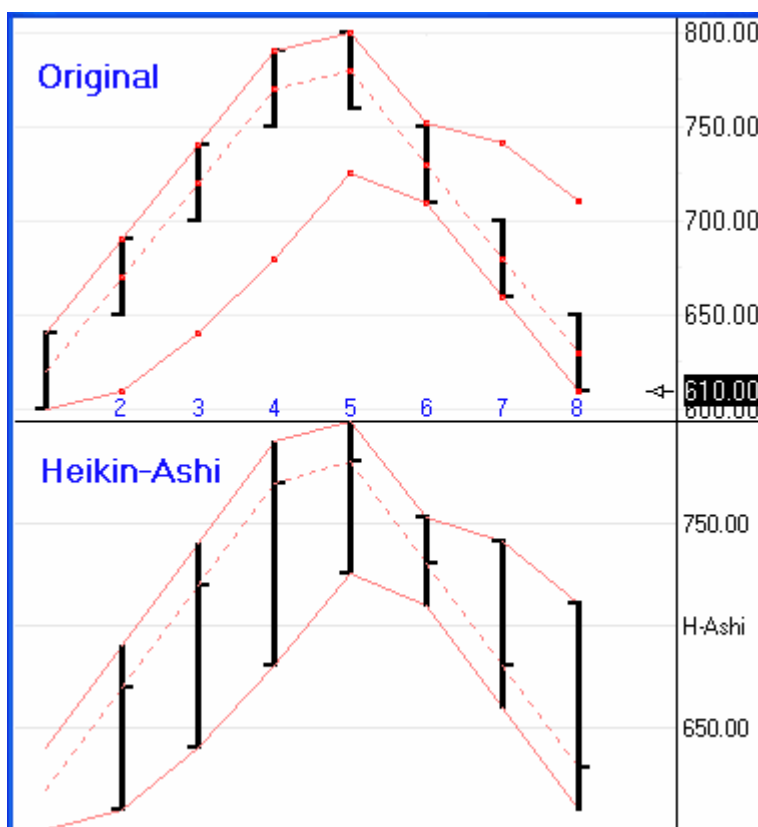
- `haHigh = MaxList(H, haOpen, haClose);`
- `haLow = MinList(L, haOpen, haClose);`

Not one of the twelve programmers who published scripts in Stocks and Commodities magazine pointed out that testing for haClose is unnecessary because it is an impossibility. It does not hurt to test for it, but it is an unnecessary step. Missing something obvious like this makes me wonder just how much serious thinking is being made to understand what this technique is all about. Now, let's leave that issue and continue with the analysis.

haClose

The Heikin-Ashi Close is the average of four bar prices: open, high, low and close. This creates an interesting effect in strongly trending markets which I feel is misleading for chart readers. Let me illustrate the effect with the following example.

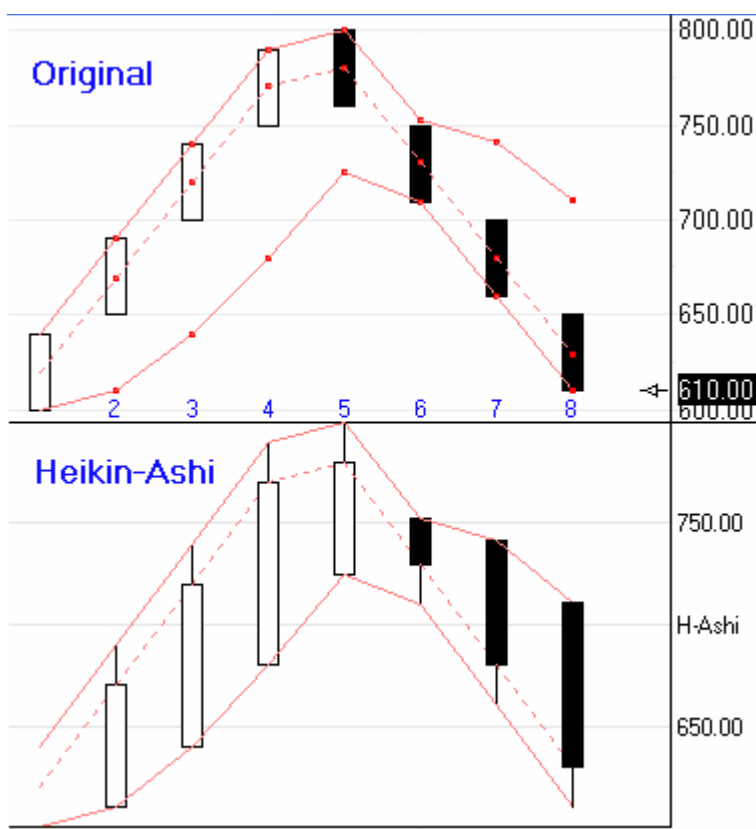
The example shows the original bar data in the top half of the chart, and the Heikin-Ashi method in the bottom half. Ensign 10 was used to prepare the examples. Bars 1 through 4 are strongly trending up, and bars 5 through 8 are strongly trending down. Now permit me to point out several things by comparing the two images.



The Heikin-Ashi data points are also shown on the original chart using small red dots, connected by solid red lines through the highs and lows, and a dotted red line through the closes. These dots and lines will aid in the comparison of what Heikin-Ashi is doing to 'average' the original bar data.

In an Up candle the haClose will always be below the actual close, and in a Down candle, the haClose will always be above the actual close. These two principles are illustrated by comparing the position of the close red dots to the bar closes in the Original chart image. In fact, haUp candles will ALWAYS have a high wick, and haDown candles will ALWAYS have a low wick. This is a built in behavior that may surprise most Heikin-Ashi candle readers. It is one of the primary areas I feel is misleading.

Note: haUp candles may or may not have a low wick. haDown candles may or may not have a high wick.



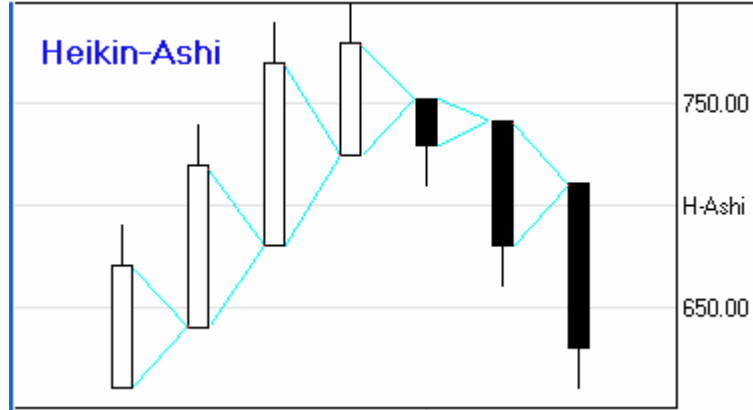
A wick on the top of a regular Up candle implies that selling pressure has moved the market back down from the high. Thus, I consider it misleading to see a high wick on a Heikin-Ashi up candle when no selling pressure is present. The inverse applies to low wicks. A wick on the bottom of a regular Down candle implies that buying pressure has moved the market off of the low. Again, it is misleading using conventional interpretation for low wicks to be present on a Heikin-Ashi down candle when no buying pressure is present.

Mathematically the haClose can never exceed 75% of the original bar's range. 75% would be achieved when the Open and the Close occur at the extreme of the bar's High. In that case, $haClose = (H+H+H+L)/4$. Simple example: $O=4, H=4, C=4, L=0$, so $haClose = 12 / 4 = 3$. So the maximum haClose value is 3/4th of the range because the range was 4. Thus the high wick size in an Up candle will be 25% of the original bar range or greater. The low wick size in a Down candle will be 25% of the original bar range or more.

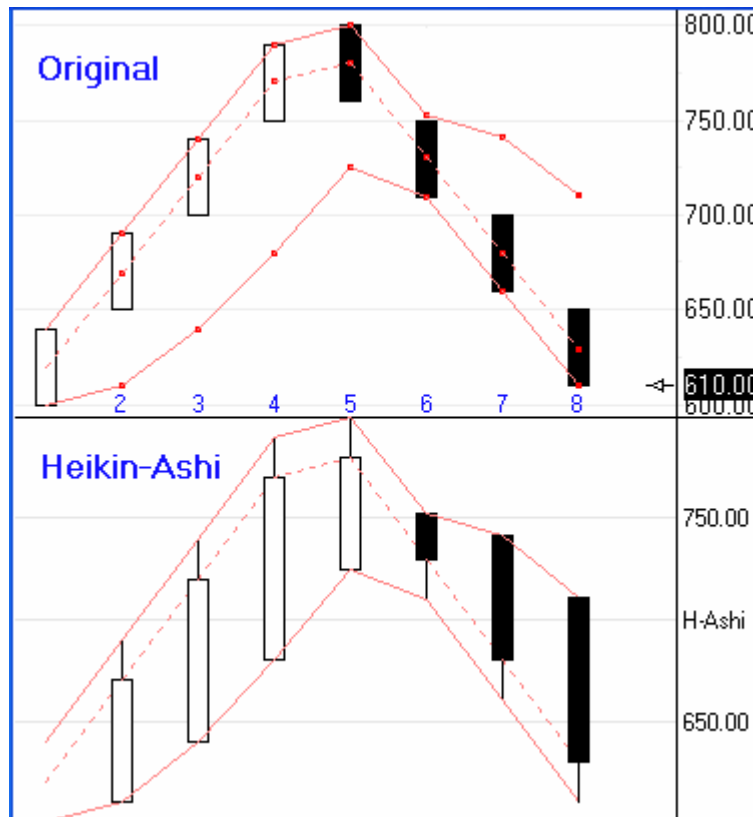
In the Chartpoint Magazine, No. 12 (2003), Yashuji Yamanaka gives five rules for trading the Heikin-Ashi charts. His Rule 2 reads, 'Positive candle with upper shadow means "strong BUY"', and 'Negative candle with lower shadow means "strong SELL"'. I have proved out that every haUp candle must have a high wick, and every haDown candle must have a low wick. Therefore, Rule 2 would have EVERY Heikin-Ashi candle be either a 'strong BUY' or a 'strong SELL'. This obviously is not the case, so I must conclude that Yamanaka's Rule 2 is an illogical statement.

haOpen

The haOpen formula can be stated more simply as the midpoint of the prior Heikin-Ashi bar's candle body. See the graphical illustration of this where the cyan lines from the prior bar's candle body range point to the candle body midpoint. This midpoint is used as the open of the following Heikin-Ashi bar.



The haOpen can be outside of the original bar's range. Therefore, the range of the Heikin-Ashi bar is extended to include the haOpen price. This extension is done by choosing the higher of High and haOpen for the haHigh, and the lower of Low and haOpen for the haLow. Mr. Valcu describes this process as eliminating 'irregularities from a normal chart', and creating a 'better picture of trends'. My opinion is that this process is creating misleading perceptions. Let's look again at the example.



One misconception in the Heikin-Ashi chart is the absence of gaps. There are 6 gaps in the original chart and they have all been 'averaged' out of the picture. If gaps mean something to you either as an indication of momentum or a price level that will eventually be filled, you will have to do without that insight when you use Heikin-Ashi charts.

Another misconception in the Heikin-Ashi chart is the length of the bars. In our example many of the HA bars are twice as tall as the original bars. HA bars will always overlap a portion of the bar on its left-hand side. In the up trending portion of the example, the HA Lows are all lower than the original lows, giving the impression the market traded at prices during that time period when no such trading occurred. As an example, consider bar #3. The original bar price range is from 700 to 740. The Heikin-Ashi bar implied that during the #3 time period, the trading was from 640 to 740. That is misleading. The visual presentation does not make any differentiation between the portion of the range that is actual and the portion that is invented.

Another misconception is the combination of bar #4 and bar #5. On the original chart, these two bars make a formation known as a Key Reversal Pair. That significant information is totally lost in the Heikin-Ashi chart. In fact, bar #5 on the HA chart is shown as an Up candle which is 100% opposite what actually happened. That too is misleading in my opinion.

Summary

I guess by now you have concluded I am not overly impressed with the Heikin-Ashi method. It may be serving a beneficial purpose for many of you, and if so, that is wonderful. I encourage you to continue using what works for you. Heikin-Ashi charts are included in Ensign 10 because users asked for it. But, I do not know if it is going to help anyone trade more profitably. Seasoned trader Ira Tunik recently stated, 'There are those that are constantly looking for the Holy Grail and [think] every new or revived study or tool is necessary. Over the years I have found that the majority of the exotic, complicated and supposedly new studies don't help anyone's trading ability or profitability.'

Whatever the case may be, at least by reading and understanding the points made in this article you will be using the Heikin-Ashi method better informed about how it is creating 'average bars'.

Article by Howard Arrington