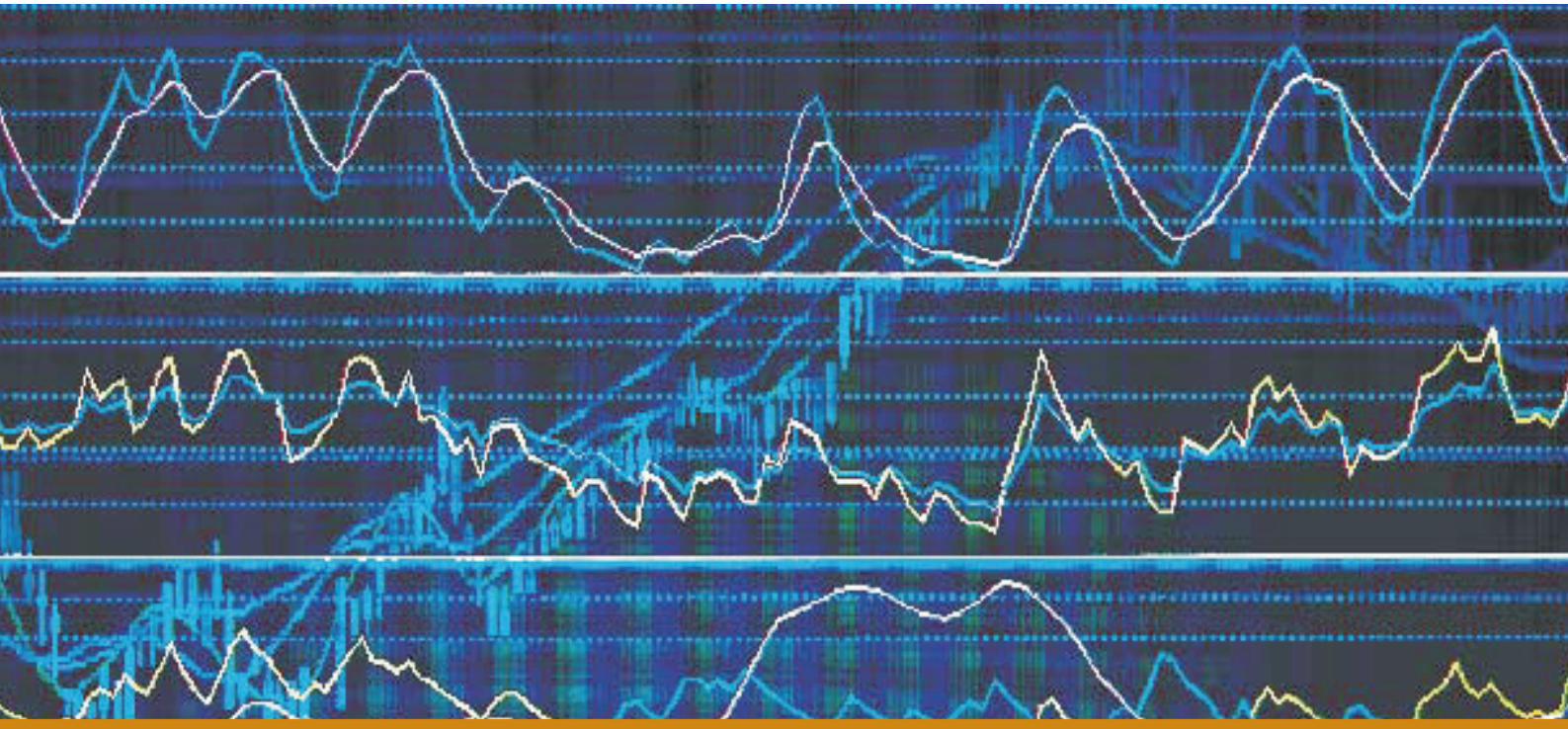
By Ng Ee Hwa, ChartNexus



DIFFERENT USES OF **MOVING AVERAGE** (MA)

Moving Average (MA) is a tool commonly used by market analysts, as popular as the use of trendlines and chart patterns to understand the price behaviour of stocks. The price of a stock can fluctuate wildly over time due to the frequent change in market sentiment, sector or industries in play and profit taking. This makes interpretation of the underlying price movement of the stock difficult. Therefore a Moving Average is usually taken by averaging the prices over a period of time producing a smoother line. Although the specific period of time used to form the MA line depends on the investment horizon and the preference of an individual, periods such as 20-day, 50-day, 100-day and 200-day are commonly used.

Two of the most common types of MA lines are the Simplified Moving Average (SMA) and the Exponential Moving Average (EMA). The Simplified Moving Average is a mean average constructed by summing up a set of closing price over a specified period and dividing the summation by the period used. By its construction, SMA is seen as a lagging indicator since the SMA value will always be "behind" the stock price. The EMA is designed to reduce the lag in the SMA by applying more weight to the more recent price data as compared to the older price data. As a result, the EMA will be more sensitive and will follow the price structure closer than the SMA. Therefore, the EMA is usually preferred over the SMA as building blocks for the construction of more complex indicators such as Moving Average Convergence Divergence (MACD) and Guppy Multiple Moving Average (GMMA).

We will now focus on the following usage of MA in the field of technical analysis:

Using Moving Average for Trend Determination

A very important step in applying technical analysis is to determine the stock prevailing trend. There are 3 types of trends namely "Uptrend", "Downtrend" and "Sideway". Each represents a different collective sentiment of the stock market participants, bullishness in an Uptrend, bearishness in a Downtrend and indecision in a Sideway market. Knowing the trend, a trader can more easily identify the tops and bottoms of the price movement for buying or shorting opportunities. Using 2 moving averages is an effective and simple way of determining the direction of the trend. If the shorter-term MA is moving well above the longer-term MA, it indicates an Uptrend. The reverse is true for a downtrend. In a Sideway market, the 2 MA lines will be seen moving almost horizontally close to each other. Figure 1 shows an example of an uptrend stock.

Using Moving Average as Support/ Resistance Level

Moving average is frequently used by market analysts to identify the support and resistance level of a stock. Knowledge of support/ resistance level can be used to identify a good price level to take a long or short position. In an uptrend, prices will usually be seen moving above the 50-day, 100-day and 200-day MA with the MA lines providing support to the price movement. In a downtrend or correction phase, the MA lines will in turn be providing resistance to price movement. It is important to observe that a longer MA will provide a stronger support/ resistance level than a shorter MA but prices will be testing the shorter MA more often than the longer MA. Hence traders with different risk appetites will select different MA periods to identify their trading opportunities.

Figure 2 shows the STI being well supported by the 10-day MA during the uptrend. After the market correction towards the end of Feb 2007, the STI attempted to resume its uptrend but this time the 10-day MA is resisting the upward movement.

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Figure 1: **Example of trend determination using 2 moving averages**

Figure 2: **MA line providing support and resistance to price movement**

Figure 3: **Crossing of MA lines for trading opportunities**

Figure 4: **EMA lines in GMMA Indicator**

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Using Moving Average Crossover

By overlaying two moving averages of different periods on the same chart, a trading signal is generated when the two MA cross each other. When the shorter MA crosses over the longer MA, a buy signal is generated while a sell signal is generated when the longer MA crosses over the shorter MA.

Figure 3 shows a buy signal was generated on two occasions when the shorter-term SMA crossed over the longer-term SMA in December 2006 and February 2007. Thereafter, the stock was trending upward with the shorter-term SMA acting as a support to the price movement. On the other hand in March 2007, a sell signal was generated when the shorter-term SMA crossed down the longer-term SMA indicating possible bearishness in price movement.

Using Moving Average in an Indicator

Exponential Moving Average (EMA) is commonly used as a building block in more complex technical indicators such as MACD, GMMA and many more. These technical indicators are created to help market analysts either to identify the trend, the strength of the trend or pinpoint the time to buy or sell. GMMA, a popular indicator using the concepts of moving averages will be presented in the following section.

GMMA is made up of three sets of EMA lines namely:

1. Short-term EMA lines which consist of three EMA lines with periods set at 3, 5 and 7
2. Mid-term EMA lines which consist of four EMA lines with periods set at 9, 11, 13 and 15
3. Long-term EMA lines which consist of five EMA lines with periods set at 30, 35, 40, 45 and 50

Three observations can be read from a GMMA chart. The first observation is the crossover signals. A bullish crossover signal occurs when the short-term EMA lines cross up over the mid-term and long-term EMA lines while a bearish signal occurs when the short-term EMA lines cross down the mid-term and long-term EMA lines. The second and third observations are the sloping and expansion/contraction between the EMA lines. If the EMA lines are sloping up and expanding among each other, this indicates the momentum in upward price movement is gathering pace. Conversely if the EMA lines are sloping down and expanding among each other, this indicates the momentum in falling prices is increasing.

In Figure 4, the first bearish crossover signal was detected in early Dec 2006 indicating a possible downtrend was possible. However, the three sets of EMA lines moved almost horizontally instead indicating that the price of SPH was moving sideways. In early January 2007, a bullish crossover occurred with the uptrend confirmed by the expansion of the three sets of up-sloping EMA lines.

The above discussion presented the different uses of MA. In addition to identifying the trends, the MA helps to identify levels of support and resistance to price movement. It is important however for users to determine the periods to be used as this will affect the effectiveness of the trading strategy based on the user's investment horizon and risk appetite.

The concepts presented above can be easily implemented and analyzed on charting software such as ChartNexus (free download at **www.chartnexus.com**). ■