

## Teamwork

# Moving Average Stochastic

*Two can be better than one. This momentum-based trading system uses two indicators and helps identify divergences and trends.*



It's not unusual to look at two indicators simultaneously to determine when trends are about to begin, end, or continue. Crossovers of indicators are a popular analytical method used by technical analysts. The moving average stochastic (MAS) is one oscillator worth paying attention to. MAS is a momentum indicator system that shows the location of two exponential moving averages (EMAs) relative to the high–low range of the larger moving average over a set number of periods. MAS is based on the stochastic oscillator, which was developed by George C. Lane. There are two separate indicators: MAS(26) and MAS(12). MAS(26) measures the level of the 26-day moving average relative to its high–low range over a given period of time. MAS(12) shows the level of the shorter 12-day moving average relative to the high–low range of the larger 26-day moving average over a set number of periods. There are three ways to use MAS:

1. MAS(12) signals can be generated by looking for divergences.
2. Traders can also look for MAS(12) or MAS(26) centerline crossovers.
3. MAS(26) and MAS(12) can also be used to identify the general trend.

Here's how it's calculated:

$$\begin{aligned}\text{MAS}(12) &= ((12\text{-day EMA} - \text{Lowest 26-day EMA}) / \\ &\quad (\text{Highest 26-day EMA} - \text{Lowest 26-day EMA})) * 100 \\ \text{MAS}(26) &= ((26\text{-day EMA} - \text{Lowest 26-day EMA}) / \\ &\quad (\text{Highest 26-day EMA} - \text{Lowest 26-day EMA})) * 100\end{aligned}$$

Lowest 26-day EMA = lowest 26-day EMA for 19 days  
Highest 26-day EMA = highest 26-day EMA for 19 days  
MAS(12) and MAS(26) are multiplied by 100 to move the decimal point two places

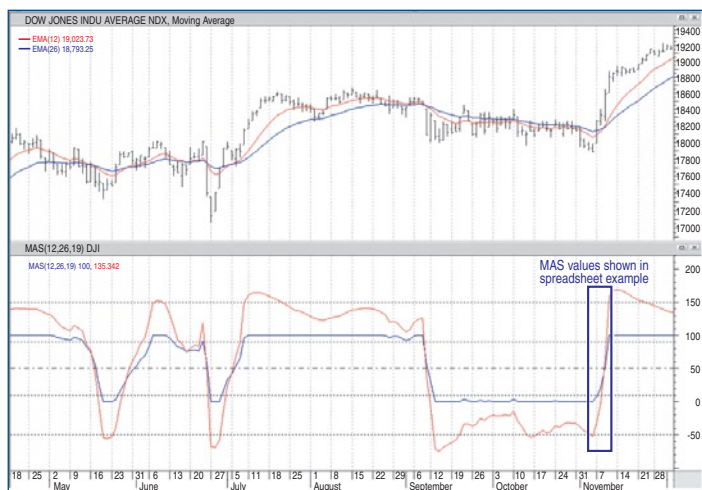
The values of 12, 26, and 19 are the typical setting used with MAS. However, other values can be substituted depending on your trading style and goals.

The table in Sidebar Figure 1 (see sidebar “MAS Calculation Example”) shows a calculation example MAS(12,26,19) for the Dow Jones Industrial Average (DJIA) using Excel. The exponential moving average starts with the simple moving average value (for EMA(12) it's 18261.22, and for EMA(26) it's 18259.14) in the first calculation. After the first calculation, the normal formula takes over.

Because an EMA begins with a simple moving average, its true value will be realized later. The values of EMA(12), EMA(26), MAS(12,19), and MAS(26,19) on the Excel spreadsheet may differ from the chart values in Figure 1 because of the short lookback period.

## INTERPRETATION

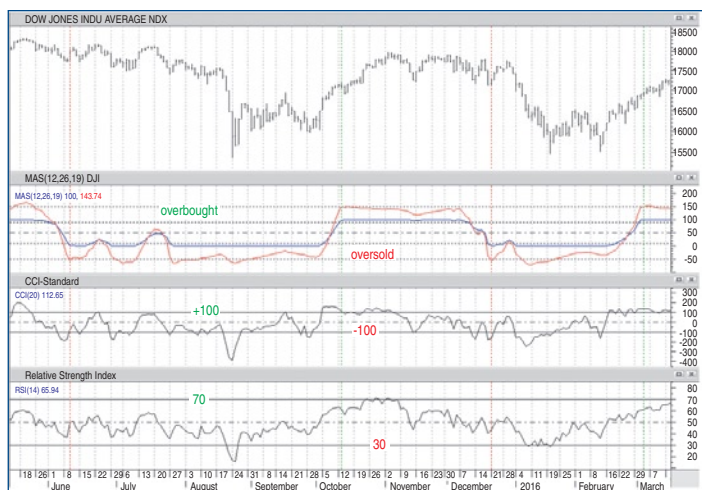
The shorter moving average, in this case 12 days, is faster. The longer moving average (26 days) is slower and less reactive to price changes in the underlying security. When the 12-day EMA is above the 26-day EMA, MAS(12) is higher than MAS(26). MAS(12) begins to drop if the shorter EMA starts to diverge from the longer EMA at a slower pace relative to the high–low range of the larger moving average, or if the moving averages move toward each other. When the 12-day EMA is below the 26-day EMA, MAS(26) is above MAS(12). MAS(12) begins to increase when the shorter EMA starts to diverge from the longer EMA at a slower speed relative to the high–low range of



**FIGURE 1: PLOTTING MAS ON A CHART.** Here you see a chart of the Dow Jones Industrial Average (DJIA) with EMA(12) and EMA(26) overlaid on the price chart and the MAS (12, 26,19) plotted on the subchart.



**FIGURE 2: OVERBOUGHT/OVERSOLD.** On this chart of the Russell 2000 index, note how the oversold/overbought levels in MAS generally coincide with the price action of the index.



**FIGURE 3: MAS VS. OTHER INDICATORS.** On this chart of the DJIA you see the MAS(12,26,19), CCI(20), and RSI(14). Note how the MAS differs from the other two indicators.

**The MAS indicator can be used to identify bearish/bullish divergences, overbought/oversold levels, and trend changes.**



the larger moving average, or if the moving averages move toward each other.

MAS(12) is an unbound oscillator. The MAS(12) is above 100 when the 12-day EMA is higher than the highest 26-day EMA for 19 days and below zero when the 12-day EMA is lower than the lowest 26-day EMA for 19 days. MAS(26) oscillates between zero and 100.

The MAS(26) is above 50 when the 26-day EMA is in the upper half of its range and below 50 when the 26-day EMA is in the lower half. MAS(26) low readings (0–10) indicate that the 26-day EMA is near or equal to its lowest 26-day EMA for 19 days. MAS(26) high readings (90–100) indicate that the 26-day EMA is close or equal to its highest 26-day EMA for 19 days.

## OVERBOUGHT/OVERSOLD

Even though MAS(12) is an unbound oscillator, it generally oscillates from -50 to 150. Securities can continue to move higher after an indicator becomes overbought. Conversely, securities can continue to move lower after an indicator becomes oversold.

MAS(26) identifies overbought and oversold levels. The oscillator ranges from zero to 100. You can use 90 as the overbought threshold and 10 as the oversold threshold. Note that you can adjust these levels to suit your analytical needs and the characteristics of specific securities.

The chart in Figure 2 shows the Russell 2000 small-cap index (\$RUT) with MAS(12,26,19). The oversold/overbought levels in MAS generally coincide with the price action of the index. For comparison, I have included a chart of the DJIA with MAS(12,26,19), CCI(20), and RSI(14) in Figure 3.

## BULLISH/BEARISH DIVERGENCES

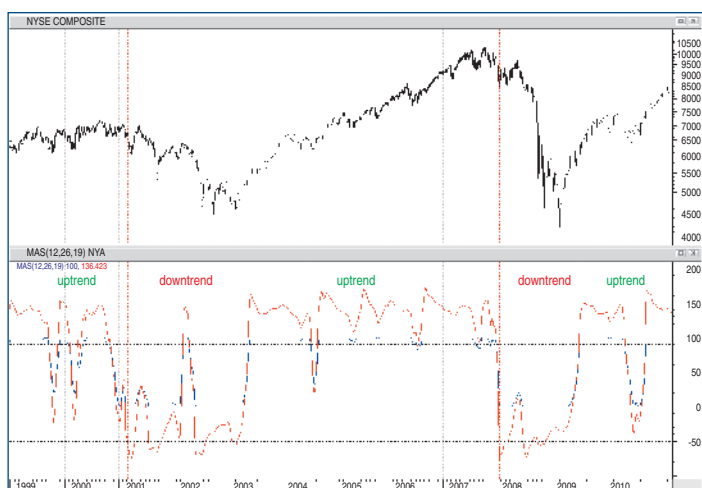
Directional momentum doesn't necessarily confirm price but divergences can signal a potential reversal point. A bullish divergence occurs when the underlying security makes a lower low and MAS(12) forms a higher low, which shows less downside momentum. A bearish divergence forms when the security records a higher high and MAS(12) forms a lower high, which shows less upside momentum. Divergences show a change in momentum that can foreshadow a trend reversal. In this case, you need confirmation from MAS(12), MAS(26), or the price chart. A bearish divergence in MAS(12) can be confirmed with a break below 50 in MAS(12) or MAS(26),



**FIGURE 4: BULLISH/BEARISH DIVERGENCES.** On this chart of the S&P 500 large-cap index (\$SPX) with MAS(12,26,19), there are three divergences over a 14-month period (June 2011–August 2012).



**FIGURE 5: BEARISH DIVERGENCES.** On this chart of the S&P 500 index, you can see that although price action in the S&P 500 is trending up, the MAS, RSI, and MACD indicate otherwise.



**FIGURE 6: BULL MARKETS VS. BEAR MARKETS.** On this weekly chart of the NYSE Composite index, you can see how the MAS(12,26,19) behaved during the 2001–2003 bear market, the 2003–2008 bull market, and the 2008–2009 bear market.

or a break in the support level on the price chart. Conversely, an MAS(12) bullish divergence can be confirmed with a break above 50 in MAS(12) or MAS(26) or a break above a resistance level on the chart.

In Figure 4 you see the chart of the S&P 500 large-cap index (\$SPX) with MAS(12,26,19). There are three divergences over a 14-month period. A bullish divergence formed in August–October 2011 as the index moved to a lower low, but MAS(12) formed a higher low. This divergence was confirmed with an MAS(12) break above 50. Also notice that SPX exceeded the August high in the middle of October. An MAS(12) bearish divergence formed in January–April 2012 as the SPX raced to new highs, but MAS(12) failed to exceed its January high. MAS(12) and MAS(26) move below 50 in the second half of April and a break of the support level on the index chart two weeks later confirmed this divergence.

Another bullish divergence formed in May–June 2012 as the index moved to a lower low, but MAS(12) formed a higher low. This divergence was confirmed with an index move above the May high and MAS(12) and MAS(26) break above 50 two weeks later.

Also notice that MAS(12) confirmed a lower low in the index in July 2011. It was confirmed with an MAS(12) and MAS(26) move below 50 and index break support in the start of August 2011. Also note that MAS(12,26,19) produced a bad signal, which was confirmed with an index move to a lower low in the second half of November 2011. This signal was fixed in early December 2011.

A strong uptrend can show numerous bearish divergences. Conversely, bullish divergences can appear in a strong downtrend. The chart in Figure 5 shows the S&P 500 large-cap index (\$SPX) from July–December 2009 with MAS(12,26,19), RSI(14), and MACD(12,26,9) for comparison. Note that MAS showed fewer lower highs than the RSI and MACD did during the uptrend in the S&P.

## TREND IDENTIFICATION

MAS triggers a bullish signal when MAS(26) exceeds 90 and MAS(12) moves above or close to 150. Conversely, MAS triggers a bearish signal when MAS(26) and MAS(12) move below 10 and -50, respectively.

The weekly chart of the NYSE Composite Index in Figure 6 shows MAS(12,26,19) during bear market 2001–2003, bull market 2003–2008, and bear market 2008–2009. Take note of how it behaves during the 2003–2008 bull market. Can you identify any indications of an upcoming bear?

## THE POWER OF MAS

As I mentioned earlier, MAS shows the location of two trend-following indicators (moving averages) relative to the high–low range of the larger moving average over a set number of periods. MAS(12) bearish/bullish divergences produce some effective buy/sell signals, the MAS (26) is effective in identifying overbought/oversold levels, and crossovers in MAS(12) and MAS(26) can be used to identify trend changes. And if you add an uncorrelated indicator to your analysis, it



## MAS CALCULATION EXAMPLE

Here's an example of calculating the MAS(12,26,19) for the Dow Jones Industrial Average (DJIA) in a spreadsheet.

Date	Close	12-day EMA	26-day EMA	EMA (26) Highest Value(19)	EMA(26) Lowest Value(19)	MAS (26,19)	MAS (12,19)
09/02/2016	18491.96						
09/06/2016	18538.12						
09/07/2016	18526.14						
09/08/2016	18479.91						
09/09/2016	18085.45						
09/12/2016	18325.07						
09/13/2016	18066.75						
09/14/2016	18034.77						
09/15/2016	18212.48						
09/16/2016	18123.80						
09/19/2016	18120.17						
09/20/2016	18129.96	18261.22					
09/21/2016	18293.70	18266.21					
09/22/2016	18392.46	18285.64					
09/23/2016	18261.45	18281.91					
09/26/2016	18094.83	18253.13					
09/27/2016	18228.30	18249.31					
09/28/2016	18339.24	18263.15					
09/29/2016	18143.45	18244.73					
09/30/2016	18308.15	18254.49					
10/03/2016	18253.85	18254.39					
10/04/2016	18168.45	18241.17					
10/05/2016	18281.03	18247.30					
10/06/2016	18268.50	18250.56					
10/07/2016	18240.49	18249.01					
10/10/2016	18329.04	18261.32	18259.14				
10/11/2016	18128.66	18240.91	18249.47				
10/12/2016	18144.20	18226.04	18241.67				
10/13/2016	18098.94	18206.48	18231.10				
10/14/2016	18138.38	18196.01	18224.23				
10/17/2016	18086.40	18179.14	18214.02				
10/18/2016	18161.94	18176.50	18210.16				
10/19/2016	18202.62	18180.52	18209.61				
10/20/2016	18162.35	18177.72	18206.10				
10/21/2016	18145.71	18172.80	18201.63				
10/24/2016	18223.03	18180.52	18203.22				
10/25/2016	18169.27	18178.79	18200.70				
10/26/2016	18199.33	18181.95	18200.60				
10/27/2016	18169.68	18180.06	18198.31				
10/28/2016	18161.19	18177.16	18195.56				
10/31/2016	18142.42	18171.82	18191.62				
11/01/2016	18037.10	18151.09	18180.18				
11/02/2016	17959.64	18121.64	18163.84				
11/03/2016	17930.67	18092.26	18146.57	18259.14	18146.57	0.00	-48.25
11/04/2016	17888.28	18060.88	18127.44	18249.47	18127.44	0.00	-54.54
11/07/2016	18259.60	18091.45	18137.23	18241.67	18127.44	8.57	-31.50
11/08/2016	18332.74	18128.57	18151.71	18231.10	18127.44	23.41	1.09
11/09/2016	18589.69	18199.51	18184.15	18224.23	18127.44	58.59	74.46
11/10/2016	18807.88	18293.11	18230.35	18230.35	18127.44	100.00	160.97
11/11/2016	18847.66	18378.42	18276.08	18276.08	18127.44	100.00	168.85

**SIDEBAR FIGURE 1: CALCULATING MOVING AVERAGE STOCHASTIC (MAS)**

may just add more power to your trading results.

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## FURTHER READING

Apirine, Vitali [2016]. "The Middle-High-Low Moving Average," *Technical Analysis of STOCKS & COMMODITIES*, Volume 34: August.

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