

CALCULATING THE KST

The suggested parameters for short, intermediate and long term can be found in sidebar Figure 1. There are three steps to calculating the KST indicator. First, calculate the four different rates of change. Recalling the formula for rate of change (ROC) is today's closing price divided by the closing price n days ago. This result is then multiplied by 100. Then subtract 100 to obtain a rate of change index that uses zero as the center point. Second, smooth each ROC with either a simple or exponential moving average (EMA). Third, multiply each smoothed ROC by its prospective weight and sum the weighted smoothed ROCs.

The formula for an exponential moving average (EMA) requires the use of a smoothing constant (α) alpha. The constant used to smooth the data is found using the formula $2/(n+1)$. For example, for $n=3$, then $\alpha=2/(3+1)=0.50$. The formula for the EMA is:

$$E_2 = E_1 + \alpha (P_2 - E_1)$$

where:

- E_2 = New exponential average
- E_1 = Prior exponential average
- P_2 = Current price

Please note the first day's calculation does not have a prior exponential average. Consequently, you just use the first day's price and begin the smoothing process the next day. Figure 2 is a spreadsheet example of the short-term weekly KST using exponential moving averages for the smoothing. Column C is the three-week rate of change. The formula for cell C20 is:

$$=(B20/B18)*100-100$$

The three-week rate of change is smoothed with a three-week EMA. The constant used to smooth the data is found using the formula $2/(n+1)$. For $n=3$, then, the constant equals $2/(3+1)=0.50$, and thus, the formula for cell D20 is:

$$=D19+0.5*(C20-D19)$$

Cell E20 is a four-week ROC:

$$=(B20/B17)*100-100$$

Cell F20 is a four-week EMA:

$$=F19+0.4*(E20-F19)$$

Short-term (D)	10	10	1	15	10	2	20	10	3	30	15	4
Short-term (W)	3	3E	1	4	4E	2	6	6E	3	10	8E	4
Intermediate-term (W)	10	10	1	13	13	2	15	15	3	20	20	4
Intermediate-term (W)	10	10E	1	13	13E	2	15	15E	3	20	20E	4
Long-term (M)	9	6	1	12	6	2	18	6	3	24	9	4
Long-term (W)	39	26E	1	52	26E	2	78	26E	3	104	39E	4

It is possible to program all KST formulas into MetaStock and the CompuTrac SNAP module.
(D) Based on daily data. (W) Based on weekly data. (M) Based on monthly data. (E) EMA.

SIDEBAR FIGURE 1: The ROC column is the rate of change. The MA column is the moving average value, and E after the moving average value indicates that the moving average is an exponential moving average. Multiply each smoothed ROC by its weight prior to summing the four smoothed ROCs.

Cell G20 is a six-week ROC:

$$=((B20/B15)*100)-100$$

Cell H20 is a six-week EMA:

$$=H19+0.29*(G20-H19)$$

Cell I20 is a 10-week ROC:

$$=((B20/B11)*100)-100$$

Cell J20 is an eight-week EMA:

$$=J19+0.22*(I20-J19)$$

Finally, cell K20 is the summed weighted smoothed ROCs. Each smoothed ROC is weighted according to sidebar Figure 1 and summed:

$$=D20+(2*F20)+(3*H20)+(4*J20)$$

—Editor

	A	B	C	D	E	F	G	H	I	J	K
1	Date	S&P 500	3 week	3 Week	4 Week	4 week	6 Week	6 week	10 Week	8 week	Summed
2	920103	419.34	ROC	EMA	ROC	EMA	ROC	EMA	ROC	EMA	Weighted
3	920110	415.10									ROC
4	920117	418.86	-0.11								
5	920124	415.48	0.09								
6	920131	408.78	-2.41	-2.41	-1.52						
7	920207	411.09	-1.06	-1.73	-1.86			-1.97			
8	920214	412.48	0.91	-0.41	-0.72			-0.63			
9	920221	411.46	0.09	-0.16	0.66	-0.17		-1.77			
10	920228	412.70	0.05	-0.05	0.39	0.05		-0.67			
11	920306	404.44	-1.71	-0.88	-1.95	-0.75		-1.06		-3.55	
12	920313	405.84	-1.66	-1.27	-1.37	-0.99		-1.28	-1.28	-2.23	
13	920320	411.30	1.70	0.21	-0.34	-0.73		-0.29	-0.99	-1.80	
14	920327	403.50	-0.58	-0.18	-0.23	-0.53		-1.93	-1.26	-2.88	
15	920403	401.55	-2.37	-1.28	-1.06	-0.74		-2.70	-1.68	-1.77	
16	920410	404.29	0.20	-0.54	-1.70	-1.13		-0.04	-1.20	-1.65	
17	920416	416.05	3.61	1.54	3.11	0.57		2.52	-0.13	0.87	0.87
18	920424	409.02	1.17	1.35	1.86	1.08		-0.55	-0.25	-0.59	0.54
19	920501	412.53	-0.85	0.25	2.04	1.47		2.24	0.47	-0.04	0.42
20	920508	416.05	1.72	0.99	0.00	0.88		3.61	1.38	2.87	0.96
											10.71

SIDEBAR FIGURE 2: SPREADSHEET FOR SHORT-TERM WEEKLY KST.
Here, the KST is calculated using exponential moving averages.