

## MOVING AVERAGES

One of the more frequently used indicators of price action is the moving average. Moving averages are used to determine whether trends exist (an addition to drawn trend lines), and are used to establish support or resistance. A recommended reference online is: [http://stockcharts.com/education/IndicatorAnalysis/indic\\_movingAvg.html](http://stockcharts.com/education/IndicatorAnalysis/indic_movingAvg.html) .

Stated simply, a moving average is an average of prices or values over a given number of periods. Popular durations are 10-day, 20-day, and 50-day for stocks (these are used to see if a positive short-term trend exists), while indexes often use the 50-day (short-term) and 200-day (long-term).

The name moving average derives from the way in which these are calculated. For example, to calculate a 3-period moving average using the hypothetical price data in the following table:

Price Value	Calculations For MA	MA=3 Value
1	---	
2	---	
3	$= (1 + 2 + 3)/3$	2
4	$= (2 + 3 + 4)/3$	3
5	$= (3 + 4 + 5)/3$	4
6	$= (4 + 5 + 6)/3$	5

Starting with the third value (the first two give missing values), we average the first three values, which gives an average of 2. For the next value, we move down one observation (this is the basis for the “Moving” in the name) and use 2,3, and 4, which gives an average of 3. The process continues. Note that each value receives an equal weight ( $= 1/\text{number of periods}$ ) in this calculation. For this reason, this is sometimes referred to as a Simple Moving Average (SMA).

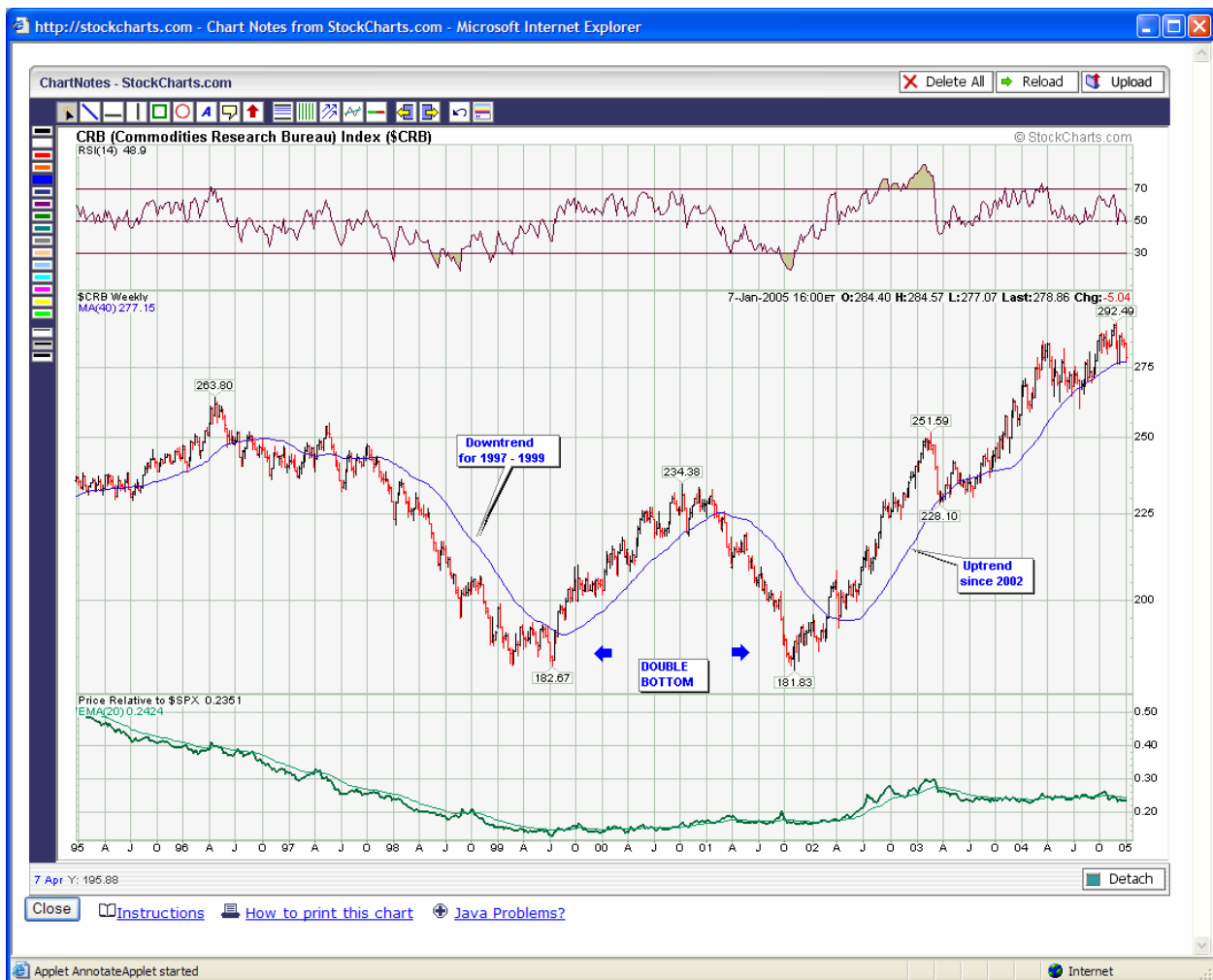
***As the calculations above show, moving averages are trend following, or lagging indicators.*** Moving averages smooth out actual values, which makes it easier to identify trends.

Another type of moving average exists, the exponential moving average, which gives more weight to the most recent data value. The Stockcharts.com reference discusses these.

## APPLICATION: COMMODITY PRICE TRENDS

Commodity prices changes are often correlated with (cost-push) inflation. They are an imperfect leading indicator of goods price inflation. One measure of commodity prices is the Commodities Research Bureau (CRB) Index (symbol: **\$CRB**).

The graph below is a weekly chart from 1995 through 2004 on the CRB Index. Included is the 40-week MA, a measure of a medium term trend in commodity prices. After peaking in early 1996, the CRB Index fell through 1999, as shown by a declining MA, formed a classic double bottom, then began a sustained period of increase through the end of 2004 (with a rising MA). From this chart, the nature of moving averages as lagging indicators is easily observed (look at the different turning points). Note how well the CRB Index has “obeyed” its 40-week MA since 2002.



**FYI: There is an important correlation between \$CRB and the US Dollar (\$USB). Over the most recent uptrend in \$CRB, the US dollar has been depreciating.**

## APPLICATION: RESISTANCE AND SUPPORT USING MA'S

Below is a weekly chart of the 10-year US Government Bond yield, **\$TNX** (you must divide the value by 10 to get the correct interest rate). We typically use 50-day and 200-day moving averages with indexes like this. Since this is a weekly chart, and there are five trading days in a typical week, we divide each of the usual MA values by 5 in weekly charts, giving 10-week and 40-week MA's.



Note how the longer-term MA, the 40-week value, has been positively sloped since March of 2003, indicating an upward long-term trend. Starting around April of 2004 (see circle), the 40-week MA was support until September of 2004 when it became resistance.

The short-term trend, the 10-week MA, fluctuates much more than the longer-term MA (this is true the shorter the MA). From July through November of 2004, the 10-week MA acted as resistance. At the very end of 2004, the 10-week MA became support, as a

period of higher rates was assumed (the Fed had some inflation language at that time, etc.).

One reason why 50 and 200-day (or 10 and 40-week) moving averages often serve as support/resistance is that in various markets, buy or sell orders are automatically triggered when price reaches these.