Technical Analysis from A to Z

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Technical analysis

Should I buy today? What will prices be tomorrow, next week, or next year? Wouldn't investing be easy if we knew the answers to these seemingly simple questions? Alas, if you are reading this book in the hope that technical analysis has the answers to these questions, I'm afraid I have to disappoint you early--it doesn't. However, if you are reading this book with the hope that technical analysis will improve your investing, I have good news--it will!

Some history

The term "technical analysis" is a complicated sounding name for a very basic approach to investing. Simply put, technical analysis is the study of prices, with charts being the primary tool.

The roots of modern-day technical analysis stem from the Dow Theory, developed around 1900 by Charles Dow. Stemming either directly or indirectly from the Dow Theory, these roots include such principles as the trending nature of prices, prices discounting all known information, confirmation and divergence, volume mirroring changes in price, and support/resistance. And of course, the widely followed Dow Jones Industrial Average is a direct offspring of the Dow Theory.

Charles Dow's contribution to modern-day technical analysis cannot be understated. His focus on the basics of security price movement gave rise to a completely new method of analyzing the markets.

The human element

The price of a security represents a consensus. It is the price at which one person agrees to buy and another agrees to sell. The price at which an investor is willing to buy or sell depends primarily on his expectations. If he expects the security's price to rise, he will buy it; if the investor expects the price to fall, he will sell it. These simple statements are the cause of a major challenge in forecasting security prices, because they refer to human expectations. As we all know firsthand, humans are not easily quantifiable nor predictable. This fact alone will keep any mechanical trading system from working consistently.

Because humans are involved, I am sure that much of the world's investment decisions are based on irrelevant criteria. Our relationships with our family, our neighbors, our employer, the traffic, our income, and our previous success and failures, all influence our confidence, expectations, and decisions.

Security prices are determined by money managers and home managers, students and strikers, doctors and dog catchers, lawyers and landscapers, and the wealthy and the wanting. This breadth of market participants guarantees an element of unpredictability and excitement.

Fundamental analysis

If we were all totally logical and could separate our emotions from our investment decisions, then, fundamental analysis the determination of price based on future earnings, would work magnificently. And since we would all have the same completely logical expectations, prices would only change when quarterly reports or relevant news was released. Investors would seek "overlooked" fundamental data in an effort to find undervalued securities.

The hotly debated "efficient market theory" states that security prices represent everything that is known about the security at a given moment. This theory concludes that it is impossible to forecast prices, since prices already reflect everything that is currently known about the security.

The future can be found in the past

If prices are based on investor expectations, then knowing what a security should sell for (i.e., fundamental analysis) becomes less important than knowing what other investors expect it to sell for. That's not to say that knowing what a security should sell for isn't important--it is. But there is usually a fairly strong consensus of a stock's future earnings that the average investor cannot disprove.

"I believe the future is only the past again, entered through another gate."
- Sir Arthur Wing Pinero, 1893

Technical analysis is the process of analyzing a security's historical prices in an effort to determine probable future prices. This is done by comparing current price action (i.e., current expectations) with comparable historical price action to predict a reasonable outcome. The devout technician might define this process as the fact that history repeats itself while others would suffice to say that we should learn from the past.

The roulette wheel

In my experience, only a minority of technicians can consistently and accurately determine future prices. However, even if you are unable to accurately forecast prices, technical analysis can be used to consistently reduce your risks and improve your profits.

The best analogy I can find on how technical analysis can improve your investing is a roulette wheel. I use this analogy with reservation, as gamblers have very little control when compared to investors (although considering the actions of many investors, gambling may be a very appropriate analogy).

"There are two times in a man's life when he should not speculate: when he can't afford it, and when he can."
- Mark Twain, 1897

A casino makes money on a roulette wheel, not by knowing what number will come up next, but by slightly improving their odds with the addition of a "0" and "00."

Similarly, when an investor purchases a security, he doesn't know that its price will rise. But if he buys a stock when it is in a rising trend, after a minor sell off, and when interest rates are falling, he will have improved his odds of making a profit. That's not gambling--it's intelligence. Yet many investors buy securities without attempting to control the odds.

Contrary to popular belief, you do not need to know what a security's price will be in the future to make money. Your goal should simply be to improve the odds of making profitable trades. Even if your analysis is as simple as determining the long-, intermediate-, and short-term trends of the security, you will have gained an edge that you would not have without technical analysis.

Consider the chart of Merck in Figure 1 where the trend is obviously down and there is no sign of a reversal. While the company may have great earnings prospects and fundamentals, it just doesn't make sense to buy the security until there is some technical evidence in the price that this trend is changing.

Figure 1

Automated trading

If we accept the fact that human emotions and expectations play a role in security pricing, we should also admit that our emotions play a role in our decision making. Many investors try to remove their emotions from their investing by using computers to make decisions for them. The concept of a "HAL," the intelligent computer in the movie 2001, is appealing.

Mechanical trading systems can help us remove our emotions from our decisions. Computer testing is also useful to determine what has happened historically under various conditions and to help us optimize our trading techniques. Yet since we are analyzing a less than logical subject (human emotions and expectations), we must be careful that our mechanical systems don't mislead us into thinking that we are analyzing a logical entity.

That is not to say that computers aren't wonderful technical analysis tools--they are indispensable. In my totally biased opinion, technical analysis software has done more to level the playing field for the average investor than any other non-regulatory event. But as a provider of technical analysis tools, I caution you not to let the software lull you into believing markets are as logical and predictable as the computer you use to analyze them.

PRICE FIELDS

Technical analysis is based almost entirely on the analysis of price and volume. The fields which define a security's price and volume are explained below.

Open - This is the price of the first trade for the period (e.g., the first trade of the day). When analyzing daily data, the Open is especially important as it is the consensus price after all interested parties were able to "sleep on it."

High - This is the highest price that the security traded during the period. It is the point at which there were more sellers than buyers (i.e., there are always sellers willing to sell at higher prices, but the High represents the highest price buyers were willing to pay).

Low - This is the lowest price that the security traded during the period. It is the point at which there were more buyers than sellers (i.e., there are always buyers willing to buy at lower prices, but the Low represents the lowest price sellers were willing to accept).

Close - This is the last price that the security traded during the period. Due to its availability, the Close is the most often used price for analysis. The relationship between the Open (the first price) and the Close (the last price) are considered significant by most technicians. This relationship is emphasized in candlestick charts.

Volume - This is the number of shares (or contracts) that were traded during the period. The relationship between prices and volume (e.g., increasing prices accompanied with increasing volume) is important.

Open Interest - This is the total number of outstanding contracts (i.e., those that have not been exercised, closed, or expired) of a future or option. Open interest is often used as an indicator.

Bid - This is the price a market maker is willing to pay for a security (i.e., the price you will receive if you sell).

Ask - This is the price a market maker is willing to accept (i.e., the price you will pay to buy the security).

These simple fields are used to create literally hundreds of technical tools that study price relationships, trends, patterns, etc.

Not all of these price fields are available for all security types, and many quote providers publish only a subset of these. Table 1 shows the typical fields that are reported for several security types.

Table 1				
	Futures	**Mutual Funds**	**Stocks**	**Options**
Open	Yes	No	Often	Yes
High	Yes	Closed end	Yes	Yes
Low	Yes	Closed end	Yes	Yes
Close	Yes	Yes (*NAV)	Yes	Yes
Volume	Yes	Closed end	Yes	Yes
Open Interest	Yes	N/A	N/A	Often
Bid	Intraday	Closed end	Intraday	Intraday
Ask	Intraday	Closed end	Intraday	Intraday

* Net Asset Value

Charts

The foundation of technical analysis is the chart. In this case, a picture truly is worth a thousand words.

Line charts

A line chart is the simplest type of chart. As shown in the chart of General Motors in Figure 2, the single line represents the security's closing price on each day. Dates are displayed along the bottom of the chart and prices are displayed on the side(s).

Figure 2

A line chart's strength comes from its simplicity. It provides an uncluttered, easy to understand view of a security's price. Line charts are typically displayed using a security's closing prices.

Bar charts

A bar chart displays a security's open (if available), high, low, and closing prices. Bar charts are the most popular type of security chart.

As illustrated in the bar chart in Figure 3, the top of each vertical bar represents the highest price that the security traded during the period, and the bottom of the bar represents the lowest price that it traded. A closing "tick" is displayed on the right side of the bar to designate the last price that the security traded. If opening prices are available, they are signified by a tick on the left side of the bar.

Figure 3

GENERAL MOTORS

High
Close
Open
Low
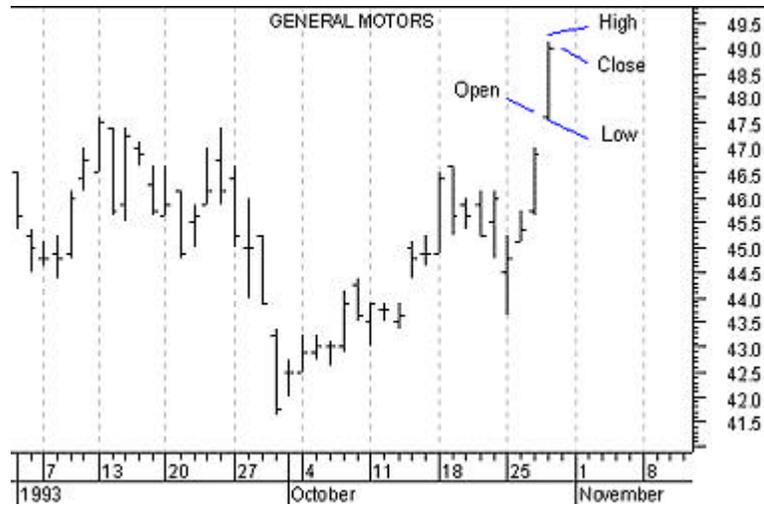
Volume bar chart

Volume is usually displayed as a bar graph at the bottom of the chart (see Figure 4). Most analysts only monitor the relative level of volume and as such, a volume scale is often not displayed.

Figure 4

GENERAL MOTORS

Volume

Figure 4 displays "zero-based" volume. This means the bottom of each volume bar represents the value of zero. However, most analysts prefer to see volume that is "relative adjusted" rather than zero-based. This is done by subtracting the lowest volume that occurred during the period displayed from all of the volume bars. Relative adjusted volume bars make it easier to see trends in volume by ignoring the minimum daily volume.

Figure 5
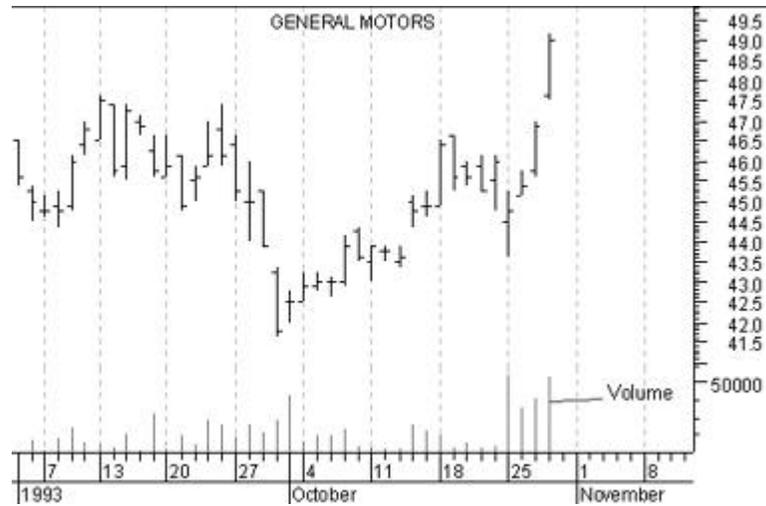
Figure 5 displays the same volume information as in the previous chart, but this volume is relative adjusted.

Other chart types

Security prices can also be displayed using other types of charts, such as candlestick, Equivolume, point & figure, etc. For brevity's sake, explanations of these charting methods appear only in Part II.

Moving Averages (I skipped over some sections (Dr. Boetticher))

Moving averages are one of the oldest and most popular technical analysis tools. This chapter describes the basic calculation and interpretation of moving averages. Full details on moving averages are provided in Part Two.

A moving average is the average price of a security at a given time. When calculating a moving average, you specify the time span to calculate the average price (e.g., 25 days).

A "simple" moving average is calculated by adding the security's prices for the most recent "n" time periods and then dividing by "n." For example, adding the closing prices of a security for most recent 25 days and then dividing by 25. The result is the security's average price over the last 25 days. This calculation is done for each period in the chart.

Note that a moving average cannot be calculated until you have "n" time periods of data. For example, you cannot display a 25-day moving average until the 25th day in a chart.

Figure 23 shows a 25-day simple moving average of the closing price of Caterpillar.

Figure 23
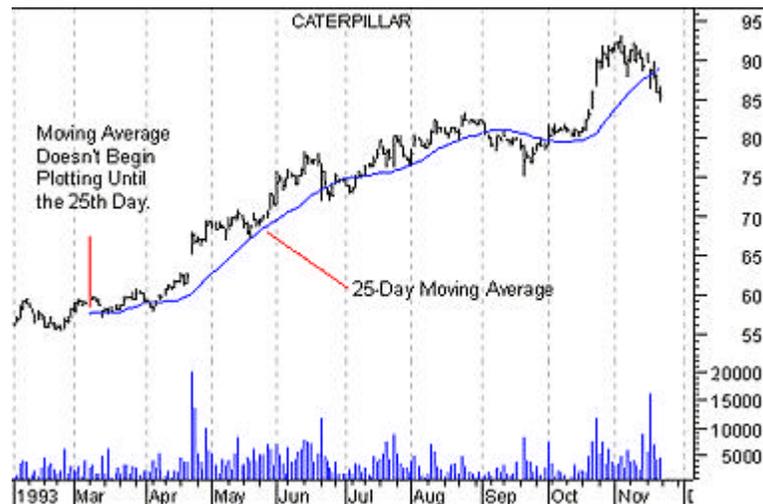
Since the moving average in this chart is the average price of the security over the last 25 days, it represents the consensus of investor expectations over the last 25 days. If the security's price is above its moving average, it means that investor's current expectations (i.e., the current price) are higher than their average expectations over the last 25 days, and that investors are becoming increasingly bullish on the security. Conversely, if today's price is below its moving average, it shows that current expectations are below average expectations over the last 25 days.

The classic interpretation of a moving average is to use it to observe changes in prices. Investors typically buy when a security's price rises above its moving average and sell when the price falls below its moving average.

Time periods in moving averages

"Buy" arrows were drawn on the chart in Figure 24 when Aflac's price rose above its 200-day moving average; "sell" arrows were drawn when Aflac's price fell below its 200-day moving average. (To simplify the chart, I did not label the brief periods where Aflac crossed its moving average for only a few days.)

Figure 24

Long-term trends are often isolated using a 200-day moving average. You can also use computer software to automatically determine the optimum number of time periods. Ignoring commissions, higher profits are usually found using shorter moving averages.

Merits

The merit of this type of moving average system (i.e., buying and selling when prices penetrate their moving average) is that you will always be on the "right" side of the market--prices cannot rise very much without the price rising above its average price. The disadvantage is that you will always buy and sell late. If the trend doesn't last for a significant period of time, typically twice the length of the moving average, you'll lose money. This is illustrated in Figure 25.

Figure 25
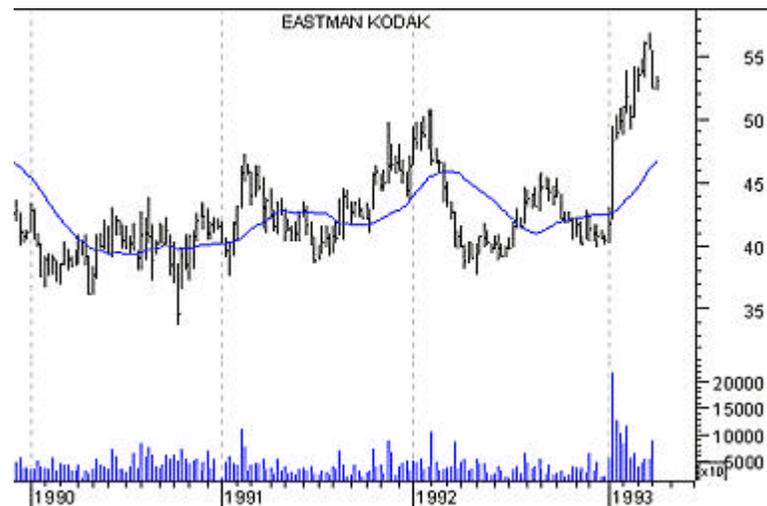
Traders' remorse

Moving averages often demonstrate traders' remorse. As shown in Figure 26, it is very common for a security to penetrate its long-term moving average, and then return to its average before continuing on its way.

Figure 26
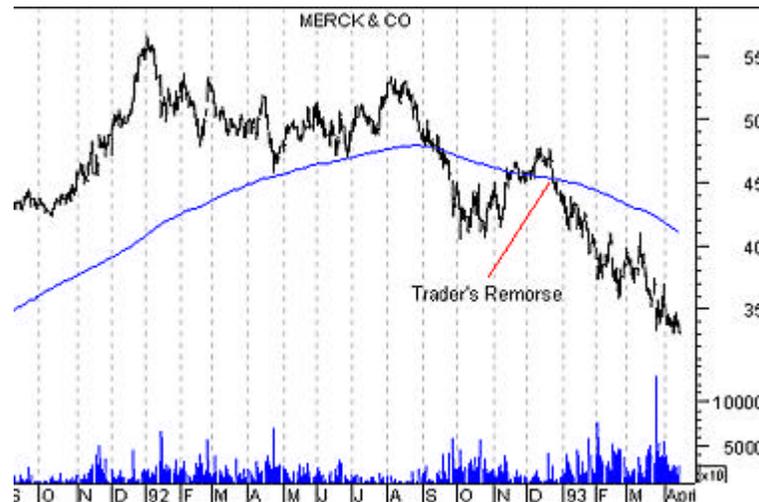
You can also use moving averages to smooth erratic data. The charts in Figure 27 show the 13 year history of the number of stocks making new highs (upper chart) and a 10-week moving average of this value (lower chart). Note how the moving average makes it easier to view the true trend of the data.

Figure 27
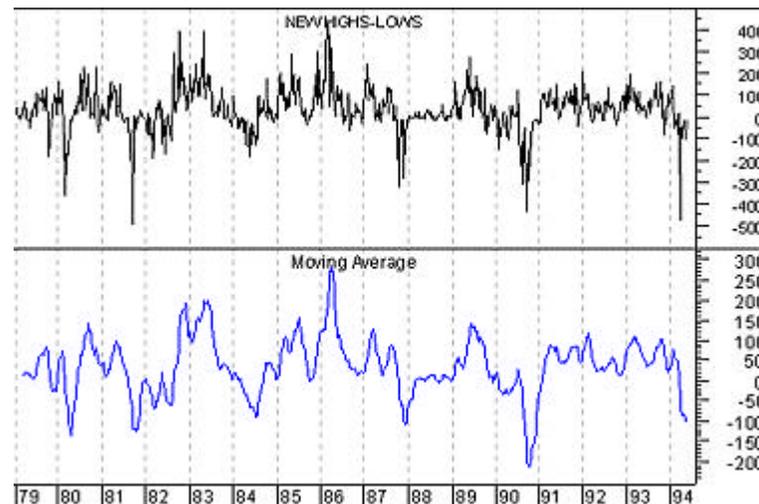
Indicators

An indicator is a mathematical calculation that can be applied to a security's price and/or volume fields. The result is a value that is used to anticipate future changes in prices.

A moving average fits this definition of an indicator: it is a calculation that can be performed on a security's price to yield a value that can be used to anticipate future changes in prices.

The following chapters (see page) contain numerous examples of indicators. I'll briefly review one simple indicator here, the Moving Average Convergence Divergence (MACD).

MACD

The MACD is calculated by subtracting a 26-day moving average of a security's price from a 12-day moving average of its price. The result is an indicator that oscillates above and below zero.

When the MACD is above zero, it means the 12-day moving average is higher than the 26-day moving average. This is bullish as it shows that current expectations (i.e., the 12-day moving average) are more bullish than previous expectations (i.e., the 26-day average). This implies a bullish, or upward, shift in the supply/demand lines. When the MACD falls below zero, it means that the 12-day moving average is less than the 26-day moving average, implying a bearish shift in the supply/demand lines.

Figure 28 shows Autozone and its MACD. I labeled the chart as "Bullish" when the MACD was above zero and "Bearish" when it was below zero. I also displayed the 12- and 26-day moving averages on the price chart.

Figure 28
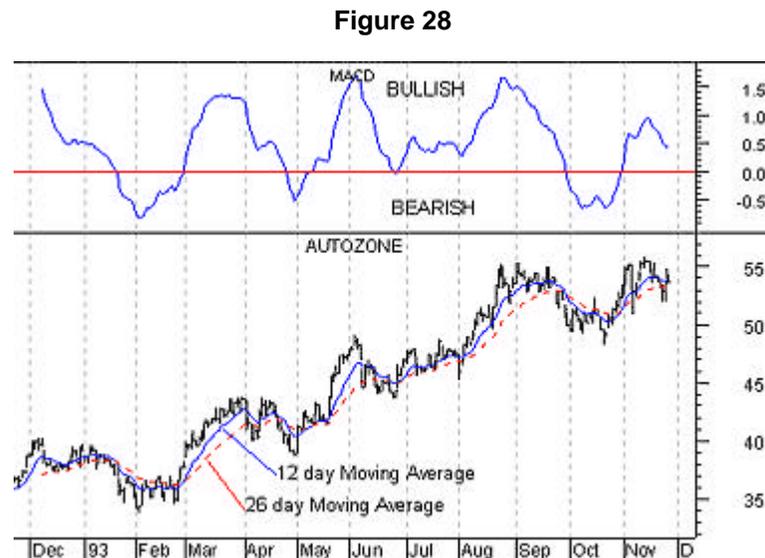
A 9-day moving average of the MACD (not of the security's price) is usually plotted on top of the MACD indicator. This line is referred to as the "signal" line. The signal line anticipates the convergence of the two moving averages (i.e., the movement of the MACD toward the zero line).

The chart in Figure 29 shows the MACD (the solid line) and its signal line (the dotted line). "Buy" arrows were drawn when the MACD rose above its signal line; "sell" arrows were drawn when the MACD fell below its signal line.

Figure 29
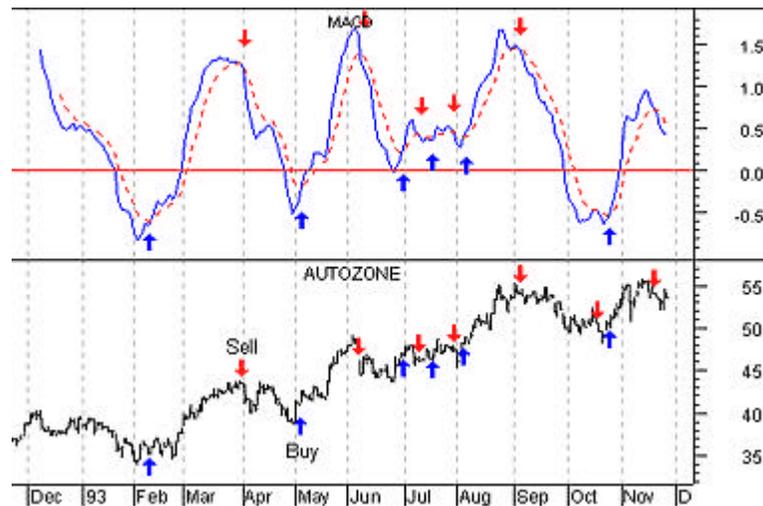
Let's consider the rational behind this technique. The MACD is the difference between two moving averages of price. When the shorter-term moving average rises above the longer-term moving average (i.e., the MACD rises above zero), it means that investor expectations are becoming more bullish (i.e., there has been an upward shift in the supply/demand lines). By plotting a 9-day moving average of the MACD, we can see the changing of expectations (i.e., the shifting of the supply/demand lines) as they occur.

Leading versus lagging indicators

Moving averages and the MACD are examples of trend following, or "lagging," indicators. [See Figure 30.] These indicators are superb when prices move in relatively long trends. They don't warn you of upcoming changes in prices, they simply tell you what prices are doing (i.e., rising or falling) so that you can invest accordingly. Trend following indicators have you buy and sell late and, in exchange for missing the early opportunities, they greatly reduce your risk by keeping you on the right side of the market.

Figure 30
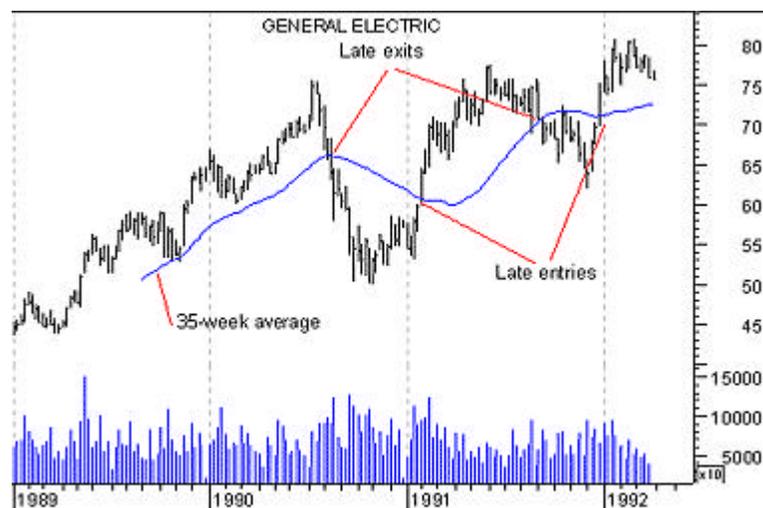
As shown in Figure 31, trend following indicators do not work well in sideways markets.

Figure 31
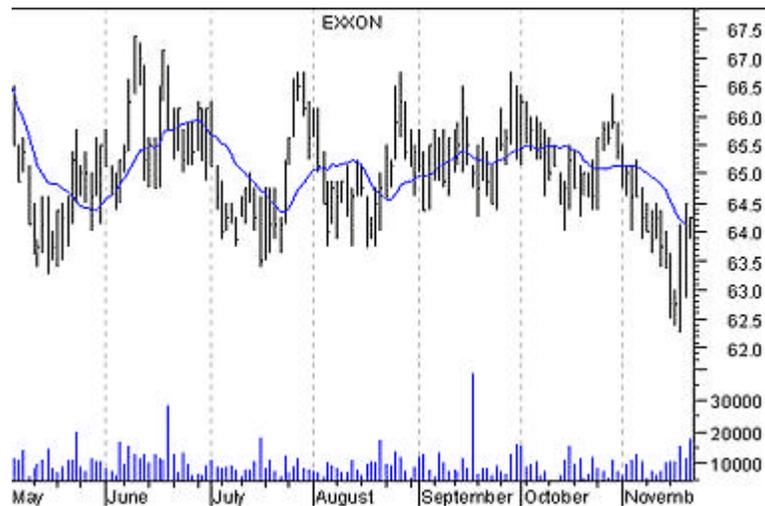
Another class of indicators are "leading" indicators. These indicators help you profit by predicting what prices will do next. Leading indicators provide greater rewards at the expense of increased risk. They perform best in sideways, "trading" markets.

Leading indicators typically work by measuring how "overbought" or "oversold" a security is. This is done with the assumption that a security that is "oversold" will bounce back. [See Figure 32.]

Figure 32
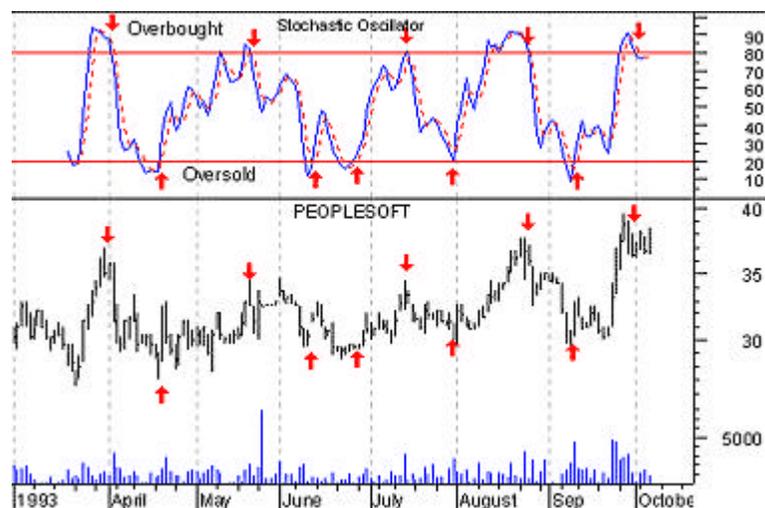
What type of indicators you use, leading or lagging, is a matter of personal preference. It has been my experience that most investors (including me) are better at following trends than predicting them. Thus, I personally prefer trend following indicators. However, I have met many successful investors who prefer leading indicators.

Trending prices versus trading prices

There have been several trading systems and indicators developed that determine if prices are trending or trading. The approach is that you should use lagging indicators during trending markets and leading indicators during trading markets. While it is relatively easy to determine if prices are trending or trading, it is extremely difficult to know if prices will trend or trade in the future. [See Figure 33.]

Figure 33

Divergences

A divergence occurs when the trend of a security's price doesn't agree with the trend of an indicator. Many of the examples in subsequent chapters demonstrate divergences.

The chart in Figure 34 shows a divergence between Whirlpool and its 14-day CCI (Commodity Channel Index). [See page .] Whirlpool's prices were making new highs while the CCI was failing to make new highs. When divergences occur, prices usually change direction to confirm the trend of the indicator as shown in Figure 34. This occurs because indicators are better at gauging price trends than the prices themselves.

Figure 34

Conclusion

This concludes the Introduction to Technical Analysis. I suggest you refer to Section Two while you continue to explore this exciting and potentially profitable pursuit.

A fitting conclusion to an introduction on technical analysis is a list of lessons I have learned, both from others and the hard way.

- Don't compound your losses by averaging down (i.e., don't keep buying additional shares at lower prices). It is tempting to think that a loss "doesn't count" until the position is closed--but it does!

- Anytime you own a security, ask yourself if you would buy it today. If you wouldn't buy it, you should consider selling it.

- Don't get distracted by others' investment prowess. Most investors only discuss their successes, threatening your focus and confidence.

- Wise investments aren't made with Ouija boards, they are made using logical approaches that minimize risks and maximize opportunities.

- Master the basics. Most investors spend their time looking for easy money (which is not an easy search) instead of learning the key factors to security prices--supply and demand.

"Opportunities flit by while we sit regretting the chances we have lost..."
- Jerome K. Jerome, 1889