

# Technical Analysis

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## Abstract

An introduction to technical analysis. For more information, see Sewell (2001).

## 1 A note on terminology

The noun “chartist” and related verb “charting” are also used, sometimes referring to a subset of technical analysis. Also, technical analysts are often referred to as “noise traders” in the academic literature (noise being anything other than news).

## 2 Definition

*Technical analysis* is the forecasting of market prices by means of analysis of data generated by the process of trading.

## 3 Assumptions

Technical analysts rely on the assumption that markets discount everything *except information generated by market action*, ergo, all you need is data generated by market action.

## 4 Why is technical analysis so popular?

If the weak (and therefore the semi-strong and strong) form of the efficient markets hypothesis holds, then technical analysis has no value. Also, if a market price follows a Markov process then technical analysis has no value. Why, then, is technical analysis so popular?

People often predict future uncertain events by taking a short history of data and asking what broader picture this history is representative of (independent of other information about its actual likelihood). This is a heuristic

known as representiveness (Tversky and Kahneman 1974). Technical analysis *is* representativeness.

Below are some more psychological explanations of why a large number of people have a strong belief in technical analysis.

**Communal Reinforcement** Communal reinforcement is a social construction in which a strong belief is formed when a claim is repeatedly asserted by members of a community, rather than due to the existence of empirical evidence for the validity of the claim.

**Selective Thinking** Selective thinking is the process by which one focuses on favourable evidence in order to justify a belief, ignoring unfavourable evidence.

**Confirmation Bias** Confirmation bias is a cognitive bias whereby one tends to notice and look for information that confirms one's existing beliefs, whilst ignoring anything that contradicts those beliefs. It is a type of selective thinking.

**Self-deception** Self-deception is the process of misleading ourselves to accept as true or valid what we believe to be false or invalid by ignoring evidence of the contrary position.

## 5 Literature review

Below, we review the most cited literature on technical analysis.

Brown and Jennings (1989) showed that technical analysis has value in a model in which prices are not fully revealing and traders have rational conjectures about the relation between prices and signals.

Frankel and Froot (1990) showed evidence for the rising importance of chartists.

Neftci (1991) showed that a few of the rules used in technical analysis generate well-defined techniques of forecasting, but even well-defined rules were shown to be useless in prediction if the economic time series is Gaussian. However, if the processes under consideration are nonlinear, then the rules might capture some information. Tests showed that this may indeed be the case for the moving average rule.

Taylor and Allen (1992) report the results of a survey among chief foreign exchange dealers based in London in November 1988 and found that at least 90 per cent of respondents placed some weight on technical analysis, and that there was a skew towards using technical, rather than fundamental, analysis at shorter time horizons.

In a comprehensive and influential study Brock, Lakonishok and LeBaron (1992) analyzed 26 technical trading rules using 90 years of daily stock prices from the Dow Jones Industrial Average up to 1987 and found that they all outperformed the market.

Blume, Easley and O'Hara (1994) show that volume provides information on information quality that cannot be deduced from the price. They also show

that traders who use information contained in market statistics do better than traders who do not.

Neely (1997) explains and reviews technical analysis in the foreign exchange market.

Neely, Weller and Dittmar (1997) use genetic programming to find technical trading rules, and find strong evidence of economically significant out-of-sample excess returns to those rules for each of six exchange rates, over the period 1981–1995.

Lui and Mole (1998) report the results of a questionnaire survey conducted in February 1995 on the use by foreign exchange dealers in Hong Kong of fundamental and technical analyses. They found that over 85% of respondents rely on both methods and, again, technical analysis was more popular at shorter time horizons.

Neely (1998) reconcile the fact that using technical trading rules to trade against U.S. intervention in foreign exchange markets can be profitable, yet, long term, the intervention tends to be profitable.

LeBaron (1999) shows that, when using technical analysis in the foreign exchange market, after removing periods in which the Federal Reserve is active, exchange rate predictability is dramatically reduced.

Lo, Mamaysky and Wang (2000) examines the effectiveness of technical analysis on U.S. stocks from 1962 to 1996 and finds that over the 31-year sample period, several technical indicators do provide incremental information and may have some practical value.

Fernández-Rodríguez, González-Martel and Sosvilla-Rivero (2000) apply an artificial neural network to the Madrid Stock Market and find that, in the absence of trading costs, the technical trading rule is always superior to a buy-and-hold strategy for both “bear” market and “stable” market episodes, but not in a “bull” market. Beating the market in the absence of costs seems of little significance unless we are interested in finding a signal which will later be incorporated into a full system. Secondly, it is perhaps naive to work on the premise that “bull” and “bear” markets exist.

Lee and Swaminathan (2000) demonstrate the importance of past trading volume.

Neely and Weller (2001) use genetic programming to show that technical trading rules can be profitable during US foreign exchange intervention.

Cesari and Cremonini (2003) make an extensive simulation comparison of popular dynamic strategies of asset allocation and find that technical analysis only performs well in Pacific markets.

Kavajecz and Odders-White (2004) show that support and resistance levels coincide with peaks in depth on the limit order book <sup>1</sup> and moving average forecasts reveal information about the relative position of depth on the book. They also show that these relationships stem from technical rules locating depth already in place on the limit order book.

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<sup>1</sup>A limit order is an order to a broker to buy(sell) a security at or below(above) a specific price; whilst a limit order book is a record of unexecuted limit orders maintained by the specialist.

## 6 Is technical analysis self-fulfilling?

Is technical analysis self-fulfilling or self-destructive? *A priori*, we hypothesize that if one conditions on price, then technical analysis is self-fulfilling; and if one conditions on time, then technical analysis is self-destructive. The evidence for the former includes the success of support and resistance, and the evidence for the latter includes the documented erosion of calendar effects.

## 7 Conclusions

Publication bias should not adversely affect the *relative* performance of technical analysis, such as comparing different techniques, or different markets. An excellent review paper by Park and Irwin (2004) does precisely that. Our own review of the literature together with their results allows us to conclude this:

- There is evidence in support of the usefulness of moving averages, momentum, support and resistance and some patterns; but no convincing evidence in support of Gann Theory or Elliott Wave Theory <sup>2</sup>.
- Technical analysis works best on currency markets, intermediate on futures markets, and worst on stock markets.
- Chart patterns work better on stock markets than currency markets.
- Nonlinear methods work best overall.
- Technical analysis doesn't work as well as it used to. As transaction costs decrease, available computing power increases and the number of market participants increases, one would expect markets to become increasingly efficient and thus it is not surprising that the efficacy of technical analysis should diminish.

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<sup>2</sup>For details of traditional technical analysis, see Edwards, Magee and Bassetti (2001), Achelis (2000), Murphy (1999) and Pring (2002). There is money to be made selling books on technical analysis. Caveat emptor! The eminently more sensible Aronson (2006) offers a glimmer of hope.

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