The Mechanisms and Techniques of Stock Analysis

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[Survey paper]

[Technical analysis]

A. **An analysis methodology for forecasting the direction of prices through the study of past market data, primarily price and volume**. [1]

B. Widely used in behavioral economics & quantitative analysis. [2][3][4]

C. Using charts, technical analysts seek to identify price patterns and market trends in financial markets and attempt to exploit those patterns. [5]

D. **Principle**

   i. A market's price reflects all relevant information impacting that market.

   ii. It is believed that price action tends to repeat itself due to the collective, patterned behavior of investors. [6][7]

   iii. **Principal assumptions**

   - All relevant information is already reflected by prices.
   - Prices trend directionally.
   - Investors collectively repeat the behavior of the preceding investors.

E. **Techniques**

   i. **Neural networks**

   - Practically used in early 1990s.
   - Neural networks used for generating trading signals given various technical and fundamental inputs have significantly outperformed buy-hold strategies as well as

traditional linear technical analysis methods when combined with rule-based expert systems. [8][9][10]

- Large-scale application is problematic because of the problem of matching the correct neural topology to the market being studied.

ii. **Backtesting**

- Test of an investment strategy on historic data.
- Most often performed for technical indicators.
- Since several trading strategies rely on human interpretation, [11] backtesting are unsuitable for computer processing.

F. **Charting terms and indicators**

i. **Concepts**

- Average true range: Averaged daily trading range, adjusted for price gaps.
- Breakout: The concept whereby prices forcefully penetrate an area of prior support or resistance, usually, but not always, accompanied by an increase in volume.
- Chart pattern: Distinctive pattern created by the movement of security or commodity prices on a chart.
- Cycles: Time targets for potential change in price.
- Dead cat bounce: The phenomenon whereby a spectacular decline in the price of a stock is immediately followed by a moderate and temporary rise before resuming its downward movement.
- Elliott wave principle and the golden ratio: Calculate successive price movements and retracements.

- Fibonacci ratios: Used as a guide to determine support and resistance.
- Momentum: the rate of price change.
- Point and figure analysis: A priced-based analytical approach employing numerical filters which may incorporate time references, though ignores time entirely in its construction.
- Resistance: a price level that may prompt a net increase of selling activity.
- Support: a price level that may prompt a net increase of buying activity.
- Trending: the phenomenon by which price movement tends to persist in one direction for an extended period of time.

ii. **Types of charts**

- Candlestick chart: Candlesticks widen and fill the interval between the open and close prices to emphasize the open/close relationship.
- Line chart: Connects the closing price values with line segments.
- Open-high-low-close chart: Plots the span between the high and low prices of a trading period as a vertical line segment at the trading time, and the open and close prices with horizontal tick marks on the range line.
- Point and figure chart: Employs numerical filters with only passing references to time, and which ignores time entirely in its construction.

iii. **Indicators**

- Breadth indicators: Based on statistics derived from the broad market.
  - ✓ Advance–decline line: A popular indicator of market breadth.
  - ✓ McClellan Oscillator: A popular closed-form indicator of breadth.

- ✓ McClellan Summation Index: A popular open-form indicator of breadth.

- Price-based indicators: Generally shown below or above the main price chart.
  - ✓ Average directional index: A widely used indicator of trend strength.
  - ✓ Commodity Channel Index: Identifies cyclical trends.
  - ✓ MACD: Moving average convergence/divergence.
  - ✓ Momentum: The rate of price change.
  - ✓ Relative strength index (RSI): Oscillator showing price strength.
  - ✓ Relative Vigor Index (RVI): Oscillator measures the conviction of a recent price action and the likelihood that it will continue.
  - ✓ Stochastic oscillator: Close position within recent trading range.
  - ✓ Trix: An oscillator showing the slope of a triple-smoothed exponential moving average.
- Volume-based indicators
  - ✓ Accumulation/distribution index: Based on the close within the day's range.
  - ✓ Money Flow: The amount of stock traded on days the price went up.
  - ✓ On-balance volume: The momentum of buying and selling stocks.

[Fundamental analysis]

A. **An analysis of a business's financial statements and factors including interest rates, production, earnings, employment, GDP, housing, manufacturing and management.**

B. **Fundamental analysis maintains that markets may incorrectly price a security in the short run but that the "correct" price will eventually be reached.**

C. **Two basic approaches** [12]

    a. Top down analysis: The top-down investor starts their analysis with global economics, including both international and national economic indicators such as GDP growth rates, inflation, interest rates, exchange rates, productivity, and energy prices. They subsequently narrow their search to regional/industry analysis of total sales, price levels, the effects of competing products, foreign competition, and entry or exit from the industry.

    b. Bottom up analysis: The bottom-up investor starts with specific businesses, regardless of their industry/region, and proceeds in reverse of the top-down approach.

D. **Objective of fundamental analysis** [13]

    a. To conduct a company stock valuation and predict its probable price evolution

    b. To make a projection on its business performance

    c. To evaluate its management and make internal business decisions and/or to calculate its credit risk

    d. To find out the intrinsic value of the share

E. **Paradigms for fundamental analysis**

a. Efficient-market hypothesis: Asset prices fully reflect all available information.
b. Random walk hypothesis: Stock market prices evolve according to a random walk and thus cannot be predicted.
c. Capital asset pricing model: A model used to determine a theoretically appropriate required rate of return of an asset.
d. Fed model Theory of Equity Valuation: A theory of equity valuation that has found broad application in the investment community.
e. Market-based valuation: A form of stock valuation that refers to market indicators.
f. Behavioral finance: Studies the effects of psychological, social, cognitive, and emotional factors on the economic decisions of individuals and institutions and the consequences for market prices.

F. Procedures

a. A financial statement analysis that includes financial ratios: check for dividends paid, operating cash flow, new equity issues and capital financing
b. Determined growth rates and risk levels are used in various valuation model.
c. The amount of debt a company possesses is a major consideration in determining its health.
d. The simple model commonly used is the P/E ratio (price-to-earnings ratio).

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