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# MOVING AVERAGE CONVERGENCE/DIVERGENCE (MACD) INDICATOR A TECHNICAL ANALYSIS TOOL REVIEW

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***Abstract***
*One well-liked technical analysis technique for spotting possible buy and sell signals in financial markets is the Moving Average Convergence Divergence (MACD) indicator. The MACD assists traders in determining the velocity and direction of an asset's price movement by calculating the difference between two moving averages. Together, the MACD line, signal line, and histogram make up the indicator, which offers important information about market trends, reversals, and potential entry or exit positions. The MACD, which is well-known for its capacity to smooth price data, facilitates the identification of trends, overbought or oversold situations, and possible trend reversals. Although the MACD is flexible and adaptable to a wide range of asset classes, such as stocks, FX, and commodities, its performance may be impacted by the time period used and market conditions. The MACD's function in automated trading systems is examined in this abstract, along with its advantages, disadvantages, and useful applications for both short-term and long-term trading choices.*

***Key Words: Moving Average Convergence Divergence (MACD, Technical Analysis Tool, Literature etc…***

## Introduction

A common technical analysis technique used by traders to assess the momentum, trends, and possible reversals of asset prices is the Moving Average Convergence Divergence (MACD). The MACD was developed by Gerald Appel in the late 1970s, and because of its ease of use and efficiency in detecting buy and sell signals, it has grown to be one of the most reliable indicators in the financial markets. The way the MACD operates is by figuring out the difference between two exponential moving averages (EMAs) of the price of an asset, usually the 26- and 12-period EMAs.

“The MACD consists of three key components:

MACD Line: The difference between the 12-period and 26-period EMAs, which reflects the momentum of an asset's price movement.

Signal Line: A 9-period EMA of the MACD line, used to generate buy or sell signals when the MACD line crosses it.

Histogram: A visual representation of the gap between the MACD line and the signal line, helping traders assess the strength of a trend by illustrating the distance between the two lines.

The MACD is used by traders to confirm price trends, spot overbought or oversold situations, and spot possible trend reversals. A possible purchase signal is produced when the MACD line crosses above the signal line, signifying bullish momentum. Conversely, a possible sell signal is generated when the MACD line crosses below the signal line, indicating negative momentum. With larger bars denoting greater velocity, the histogram provides a visual representation of the trend's strength.

Even while the MACD is good at identifying trends and reversals, traders must take into account other elements including time frames, market circumstances, and complementing indicators to validate its signals and lower the possibility of false positives. The MACD is a vital tool for both short-term and long-term traders who want to examine price movements and make wise judgments since it is flexible and can be used for a range of asset classes, such as stocks, currency, and commodities."

**Objectives of the Study**

1. To understand the concept of the Moving Average Convergence Divergence (MACD) in the stock market.
2. To conduct a review of the existing literature on the Moving Average Convergence Divergence (MACD).

**Data Collection**

The current study is based on the author's research. The secondary data used in this article was collected from various publications, websites, and other studies conducted by different researchers.

**Review literature**

It is essential to review prior research articles in order to steer any investigation in the proper path. It facilitates comprehension of the most recent developments in the field of study, allowing the researcher to create efficient research techniques. This include establishing the goals of the study, coming up with theories, and choosing pertinent factors to look at. It also indicates topics that still need investigation and offers insights into what has already been achieved in previous research.

**Diksha Dubey, Prof. Pavan Mishra and Prof.Vivek Sharma (January, 2023),**"in paper titled Effectiveness of MACD Indicator in Stock Market and Price Prediction of Stocks researchers examined the Numerous take-profit and stop-loss tactics have been put out and evaluated over time. The performance of several approaches used to various assets, such as forex, metals, energy, and cryptocurrencies, that are incorporated into a basic MACD automated trading system is assessed and contrasted in this study. According to their research, the most effective ATR-based stop-loss strategy is a sliding and variable ATR window with a period of 12 and a multiplier of 6. Furthermore, researchers find that a straightforward MACD strategy performs better than take-profit strategies that use quicker MACD signals. The adaptive MACD Expert Advisor used in this study incorporates back-tested optimum parameters specific to each asset and uses the ATR indicator's price levels to establish Stop Loss limits."

**Dipak Vishwakarma, Trupti Aod, Ghanshyam Gaur, Prof. Samir Thakkar (March 2021),** "in paper titled Trading Through Technical Analysis with MACD And EMA Indicators researchers looked at how technical indicators are becoming more widely available to traders as digitalization keeps developing. This tendency is accompanied by a change in emphasis from fundamental analysis to technical analysis as investment horizons get shorter. Technical analysis's efficacy is still up for question, particularly when compared against the efficiency of the market hypothesis. The academic community generally supports the hypothesis of random asset price movement, even though many trading techniques are largely dependent on price action and technical indications. By applying MACD and EMA indicators to actual asset data and contrasting the outcomes with those obtained from randomly generated values, this study aims to evaluate the efficacy of technical analysis. The study compares data from the stock market and currency pairings with data generated at random in order to assess the performance of trading cycles based on these technical indicators."

**Ayush Kasera (March 2023),** "in paper titled Study on Relative Strength Index and Moving Average Convergence Divergence in Capital Market Researchers looked at the in both established and emerging markets, traders and investors frequently employ technical analysis to help them make well-informed investment decisions. The Moving Average Convergence Divergence (MACD) and the Relative Strength Index (RSI) are two essential technical analysis tools that are used to forecast future stock price patterns. Technical analysis is frequently restricted to MACD and other fundamental indicators in nations like India, which is still a growing market. In order to evaluate the usefulness of MACD and RSI indicators for making successful investing decisions in the Indian financial market, this study focuses on a sample of stocks that are regularly traded on the NSE. Evaluating the possible effects of ordinary MACD and RSI indicators in comparison to enhanced versions of these indicators is the study's main goal. Applying basic MACD and RSI indicators might result in more successful investments than the conventional buy-and-hold approach, according to the primary premise (Efficient Market premise). Excel is used in the study to analyze mathematical data. According to the data, the buy-and-hold approach outperforms the usual MACD and RSI indicators in terms of profitability. The Efficient Market Hypothesis is called into question by the data, which also show that the buy-and-hold strategy is outperformed by optimized MACD and RSI indicators."

**Marouane MKIK, Kaoutar El Menzhi, Salwa MKIK (December 2020),** "in paper titled the performance of MACD indicator in Forex Researchers looked at how trading automation has grown to be a vital concern in the financial industry. The fundamental idea behind automatic trading is transactions, which make it possible to extract different technical indications from Forex markets. It's critical to understand that every indication has unique advantages and disadvantages. The performance of the MACD indicator is examined in this article using four different currency pairs: EURUSD, GBPUSD, USDCHF, and USDJPY. By looking at the earnings made and analyzing market patterns between 2001 and 2010, the study evaluates each pair separately to see how well they performed. The indicator is assessed using the VHTS (Virtual Historical Trading Software), which verifies assumptions using simple equations. The buy or sell signals produced by the MACD indicator provide the basis for trading choices."

**Conclusion**

The usefulness and importance of MACD tools in technical analysis for decision-making are highlighted in this publication, which also provides an overview of these tools. Technical analysis instruments cannot forecast the price of assets in the future, even though they are based on historical prices and occurrences. It is clear that one of the greatest technical analysis tools available today is the MACD. Although MACD is a very powerful analytical tool in and of itself, it produces better results when combined with fundamental analysis and other technical analytical tools.

If one is familiar with the technical MACD indicator, they may trade or invest in stocks and make money. Traders lose money when they don't have a proper strategy and trading guidelines to follow. The investor is at danger of losing money on the stock market if they just use technical indicators. Every investor should consistently adhere to techno funda analysis, which combines both technical and fundamental study. Investors should only use technical analysis when a company's fundamentals are sound.

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