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Intraday Volatility and Technical Analysis for CFDs: Trading Financial Securities in a Dynamic Market Environment

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Kuvailulehti

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Päivänsisäinen volatiliteetti ja tekninen analyysi CFD:lle: Kaupankäynti rahoitusarvopapereilla dynaamisessa markkinaympäristössä

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Tiivistelmä

Kaupankäynnin alalla tutkittiin useiden indikaattorien ja kaaviokuvioiden yhdistämistä kaupankäyntipäätösten luotettavuuden ja kannattavuuden parantamiseksi. Tavoitteena oli arvioida erilaisten teknisten indikaattorien, kuten RSI, MACD, EMA ja DMI, tehokkuutta yhdistettynä kaaviokuvioihin sekä kaupankävijän käyttäytymiseen vaikuttaviin psykologisiin tekijöihin. Tutkimusmenetelmä sisälsi historiallisten kaupankäyntitietojen analysoinnin, teknisten indikaattorien soveltamisen ja hintakuvioiden tarkastelun mahdollisten kaupankäyntimahdollisuuksien tunnistamiseksi. Tulokset osoittivat, että yksittäisiin indikaattoreihin tukeutuminen johti usein virheellisiin signaaleihin, erityisesti trendimarkkinoilla. Sen sijaan useiden indikaattorien yhdistäminen kaaviokuvioihin tuotti tarkempia ja kannattavampia kaupankäyntisignaaleja. Lisäksi tutkimus korosti psykologisten tekijöiden merkittävää vaikutusta kaupankäyntipäätöksiin. Tunteelliset reaktiot, kuten pelko, toivo ja kivun välttämisen halu, havaittiin kriittisiksi vaikuttajiksi kaupankävijöiden toiminnassa. Itsetietoisuuden ja tunteiden hallinnan kehittäminen osoittautui olennaiseksi johdonmukaisen kannattavuuden saavuttamiseksi. Tutkimuksen johtopäätöksenä korostettiin, että menestyvä kaupankäynti edellyttää kokonaisvaltaista lähestymistapaa, jossa tekninen analyysi ja tunneäly yhdistetään rationaalisten päätösten tekemiseksi. Tämä lähestymistapa on elintärkeä pitkäaikaisen menestyksen saavuttamiseksi rahoitusmarkkinoilla.

Avainsanat (asiasanat)

Markkinat, CFD, Treidaus, Sijoittaminen, Psykologia, Teknikaalinen-analyysi

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Description

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Abstract

In the field of trading, the integration of multiple indicators and chart patterns was investigated to enhance the reliability and profitability of trading decisions. The objective was to assess the effectiveness of various technical indicators, such as RSI, MACD, EMA, and DMI, in combination with chart patterns and psychological factors influencing trader behavior. The methodology involved analyzing historical trading data, applying technical indicators, and observing price patterns to identify potential trading opportunities. The results indicated that relying solely on single indicators often led to false signals, particularly in trending markets. Conversely, combining multiple indicators with chart patterns provided more accurate and profitable trading signals. Additionally, the study highlighted the significant impact of psychological factors on trading decisions. Emotional responses such as fear, hope, and the desire to avoid pain were identified as critical influences on traders' actions. Developing self-awareness and emotional regulation was found to be essential for achieving consistent profitability. The conclusion emphasizes that successful trading requires a holistic approach, balancing technical analysis with emotional intelligence to make rational decisions. This approach is vital for long-term success in the financial markets.

Keywords/tags (subjects)

Financial-markets, CFD, Trading, Investing, Psychology, Technical-Analysis

Miscellaneous (Confidential information)

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Contents

1 Introduction

The rapid evolution of financial markets, particularly in the digital age, has necessitated more sophisticated methods for analyzing price movements and trends. Among these methods, technical analysis has appeared as a key tool for traders and investors aiming to make informed decisions in dynamic market conditions. This thesis examines the effectiveness of various technical analysis tools and strategies, particularly their application to Contracts for Difference (CFDs), a versatile financial instrument that has gained increasing popularity.

The motivation for this research stems from the need to evaluate how well technical analysis can guide investors in navigating the complications of modern financial markets. By focusing on CFDs, this study aims to fill the gap between theory and practice, exploring the potential of technical indicators, chart patterns, and risk management techniques in real-world trading scenarios.

1.1 Research Motivation

With financial markets becoming more accessible to retail investors, especially through advanced trading platforms, the demand for reliable tools to predict market trends has grown significantly. Technical analysis is one such method that helps investors make sense of price and volume data, offering insights into potential trading opportunities. Despite its widespread use, questions remain about the true effectiveness of technical analysis in consistently delivering accurate predictions across varying market conditions.

CFDs offer a unique avenue for investors, allowing them to speculate on price movements without owning the underlying asset. The versatility and accessibility of CFDs make them an attractive option for traders, but they also introduce significant risks. This study aims to offer a more thorough understanding of how investors can enhance their strategies in volatile markets by combining technical analysis with the intricacies of CFD trading.

1.2 Research Objectives and Questions

This study aims to evaluate the effectiveness of technical indicators such as the RSI, MACD, and DMI in CFD trading environments. Specifically, it focuses on how these indicators can improve decision-making and risk management in volatile market conditions, providing insights into the practical applications of technical analysis in dynamic trading scenarios

This thesis aims to assess the reliability and robustness of technical analysis tools in recognizing potential trading opportunities and managing risk, with a focus on CFDs. To achieve this, the following research objectives have been defined:

Objective 1: Evaluate the effectiveness of technical analysis tools and techniques in identifying market trends across various financial environments.

Objective 2: Explore the integration of technical and fundamental analysis methodologies to enhance investment decision-making.

Objective 3: Assess the role of CFDs as investment instruments, focusing on their advantages and risks in dynamic market conditions.

To achieve these objectives, the following research questions are addressed:

Q1: How effective are various technical indicators and chart patterns in predicting price movements in CFD markets?

Q2: Can the integration of technical and fundamental analysis provide a more complete framework for investment decisions?

Q3: What are the key risks and benefits related with using CFDs as an investment tool?

1.3 Thesis Structure

The structure of this thesis is designed to guide readers through a systematic exploration of technical analysis, CFDs, and their practical applications. The literature review examines the theoretical foundations of technical and fundamental analysis while providing an overview of CFD trading, including its risks and regulatory considerations. The methodology chapter outlines the research design, data collection methods, and criteria for selecting the tools and techniques used in the empirical analysis. The empirical research chapter showcases the findings, synthesizing theoretical insights with real-world data to assess the effectiveness of technical analysis strategies. Finally, the conclusion summarizes key findings, offering practical recommendations for traders and identifying avenues for future research.

2 Literature review

The financial markets are vast and complex, encompassing a wide range of participants, analytical tools, and factors that drive investment decisions. This literature review aims to ensure a comprehensive understanding of these markets by examining the key players, the psychological factors influencing market behavior, and the two main approaches to market analysis: technical and fundamental. In addition, it delves Contracts for Difference (CFDs) investment instrument and the technical analysis tools that investors rely on, including indicators like the Moving Average Convergence Divergence (MACD) and Relative Strength Index (RSI). By integrating these elements, this review seeks to establish a clear foundation for understanding how trends, market conditions, and chart patterns shape investment strategies and outcomes.

2.1 Participating in Financial Markets

Participation in financial markets involves a broad spectrum of actors, each with distinct roles, strategies, and objectives. These participants navigate a complex landscape shaped by market dynamics, regulatory frameworks, and economic forces, contributing to the vibrancy and volatility of global financial ecosystems.

2.1.1 Market Participants

Financial markets accommodate a diverse array of participants, encompassing both retail and institutional investors.

Retail Investors includes individual traders and small-scale investors who engage in financial markets with personal funds. Retail investors often operate through brokerage accounts and online trading platforms, executing trades in stocks, bonds, commodities, currencies, and derivatives. Their investment strategies range from speculative trading to long-term wealth accumulation, reflecting varying risk appetites and financial goals.

Institutional investors comprise large entities with substantial financial resources, including hedge funds, pension funds, mutual funds, banks and insurance companies. These institutions manage vast pools of capital on behalf of clients or shareholders, deploying sophisticated strategies to generate returns and manage risk. Institutional investors often exert significant influence on market trends and asset prices through their sizeable trades, strategic investments, and market analysis capabilities.

Within the realm of institutional investors, specialized entities such as hedge funds pursue alternative investment strategies, including arbitrage, hedging, and leverage, to capitalize on market inefficiencies and generate alpha. Mutual funds, on the other hand, aggregate capital from various investors to create diversified portfolios of bonds, stocks, or other assets, catering to a broad range of investment preferences and risk tolerances. Menkhoff (2010) provides empirical evidence that technical analysis is frequently used by fund managers worldwide, suggesting its importance in professional trading environments (Menkhoff, 2010).

2.1.2 Market Psychology

Market psychology, rooted in the collective emotions and behaviors of market participants, exerts a profound impact on price movements and market dynamics. Agarwal, S., Kumar, S., & Goel, U. (2019) conducted an empirical study showing that psychological factors significantly influence trading behavior, underscoring the need for traders to consider their mental state when engaging

in the market (Kumar, 2019). Understanding and interpreting market sentiment is crucial for navigating financial markets effectively and identifying opportune moments for trading or investment.

Market sentiment encompasses the prevailing mood or attitude of investors towards a certain asset, sector, or the overall market. Factors such as fear, greed, pessimism, and optimism influence investor decision-making processes, driving buying and selling activity and shaping price trajectories. Sentiment indicators, sentiment surveys, and media coverage often provide awareness into prevailing market sentiment, enabling investors to measure market sentiment and sentiment shifts.

Behavioral finance theories provide valuable perception into the psychological biases and cognitive errors that shape investor behavior and market results, with biases such as anchoring, confirmation bias, and herd mentality often leading to irrational investment decisions, distorting market prices, and creating opportunities for arbitrage or contrarian strategies. Barberis and Thaler (2003) offer an overview of behavioral finance, emphasizing the significance of psychological factors in investment decisions and how these biases can affect trading outcomes (Thaler B. a., 2003). By understanding these behavioral tendencies, investors can reduce the impact of biases on their decision-making processes and capitalize on market inefficiencies (Irwin P. &., 2007).

Behavioral finance theories provide important insights into the psychological biases and cognitive errors that shape investor behavior and impact market results. Biases such as anchoring, confirmation bias, and herd mentality frequently result in irrational investment choices, distort market prices, and create opportunities for arbitrage or contrarian strategies. Barberis and Thaler (2003) offer a detailed overview of behavioral finance, highlighting the importance of psychological factors in investment decisions and how these biases can influence trading outcomes.

Elder emphasizes the significance of psychological factors in trading success, suggesting that emotional regulation is crucial for maintaining discipline in decision-making (Elder, 1993). Similarly, Tharp illustrates the impact of psychological biases on trading outcomes (Tharp, 2007).

2.2 Overview of Technical and Fundamental Analysis

2.2.1 Technical Analysis

Technical analysis, while widely used, has evolved significantly since its origins in the Dow Theory. At its core, it involves examining historical price movements and trading volume to forecast future price action. The foundational belief is that all available information is shown in the price, and that price movements are likely to follow recurring patterns, which can be identified through chart analysis and technical indicators.

Recent studies, such as those by Brock, Lakonishok, and LeBaron (1992), have demonstrated that basic technical trading rules like trading ranges and moving averages can generate abnormal returns, although they acknowledge that these rules are not foolproof (Brock, 1992). Another critical review by Park and Irwin synthesizes over 95 studies on the profitability of technical analysis, concluding that while some methods, such as momentum-based strategies, can be effective, others are highly dependent on market conditions (Irwin, 2007). Jegadeesh and Titman (1993) discovered that momentum strategies could lead to exceptional returns by capitalizing on past price trends, providing evidence against market efficiency (Jegadeesh, 1993).

2.2.2 Fundamental Analysis

Fundamental analysis centers on assessing the intrinsic value of an asset by examining pertinent economic, financial, and qualitative factors. This analysis considers factors like company earnings, financial ratios, macroeconomic indicators, industry dynamics, and qualitative aspects like management quality and competitive advantages. Fundamental analysts aim to examine whether an asset is undervalued or overvalued relative to its fundamentals, helping investors make long-term investment decisions. Sharpe ratio is one the most used ratio used by fundamental analysts. Sharpe (1966) developed the Sharpe ratio to assess the risk-adjusted return of a portfolio, which is especially relevant in evaluating the performance of leveraged CFD trading strategies (Sharpe, 1966).

Furthermore, it can occur that the price of an asset, for example, due to overreaction by traders, consistently differs from the fundamental value. In that case, short-term fundamental trading

would not be profitable, and therefore it is said that fundamental analysis should be used to make long-term predictions (Griffioen, 2003).

2.2.3 Integration of Approaches

While technical and fundamental analysis are traditionally viewed as distinct approaches, many investors employ a combination of both to gain an extensive understanding of market dynamics. Integrating technical and fundamental analysis allows investors to capitalize on the strengths of each approach and reduce their respective weaknesses. Namely fundamental analysis provides the "why" behind price movements, while technical analysis offers timing and entry/exit points.

Fama's Efficient Market Hypothesis proposes that asset prices show all available information, supporting the integration of both technical and fundamental analysis for better decision-making (Fama, 1970).

2.3 Factors Influencing Investments

Investment decisions are affected by various factors, each of which plays a vital role in shaping market dynamics and investor behavior.

The overall health of an economy, indicated by factors such as GDP growth, inflation rates, interest rates, and unemployment levels, has a significant effect on investor sentiment and asset prices. For example, strong GDP growth and low unemployment typically boost investor confidence and elevate stock prices, whereas increasing inflation rates may lead central banks to raise interest rates, which could suppress investment activity. Daniel, Hirshleifer, and Subrahmanyam (1998) demonstrate that investor psychology, particularly overconfidence and biased self-attribution, plays a critical role in stock market anomalies (Daniel, 1998).

Grasping the relationships between various asset classes is essential for effective portfolio diversification and risk management. For instance, in periods of economic uncertainty, investors often turn to safe-haven assets such as gold or government bonds, which can lead to a decline in stock prices. Understanding these correlations allows investors to build portfolios that can withstand market volatility.

Investor sentiment, which is frequently indicated by market trends and sentiment indicators, can greatly influence buying and selling decisions. Positive sentiment can drive bullish market behavior, leading to increased buying activity, while negative sentiment may result in panic selling and market downturns. Behavioral finance theories suggest that investor sentiment can sometimes lead to market inefficiencies, presenting opportunities for contrarian investors. Behavioral finance highlights the role of psychological biases such as fear and greed, that can disrupt market efficiency and lead to irrational investment choices (Irwin P. &., 2007).

Geopolitical tensions, natural disasters, and regulatory changes have the potential to cause significant market volatility and disrupt investment strategies. For example, geopolitical conflicts in key oil-producing regions can cause oil price spikes, impacting energy-depended industries. Similarly, regulatory changes, such as tax reforms or trade policies, can have far-reaching implications for businesses and investors alike.

Sector-specific factors, including technological innovations, regulatory developments, and demographic shifts, play a vital role in reforming investment opportunities and risks. For instance, advancements in renewable energy technologies may present long-term investment opportunities in the clean energy sector, while regulatory changes in healthcare policy can impact pharmaceutical companies' profitability.

2.4 Introduction to CFDs (Contract-For-Difference)

2.4.1 Defining CFDs

CFDs are derivative financial instruments that enable traders to speculate on the price movements of assets without actually owning them. Rather than purchasing the asset itself, traders enter into an agreement with a broker to exchange the price difference from the time the contract is opened to when it is closed. CFDs provide traders with flexibility, liquidity, and access to various markets, such as stocks, currencies, commodities, indices, bonds, cryptocurrencies, and exchange-traded funds (ETFs).

2.4.2 Strengths and Limitations

CFD trading offers several advantages, such as leverage, short-selling opportunities, and the possibility to monetize from both falling and rising markets. Although, it also involves risks, including leverage magnifying losses, overnight financing costs, counterparty risk, and potential regulatory changes affecting CFD trading conditions.

2.4.3 Selecting a Brokerage

Choosing the right brokerage is essential for CFD trading success. Factors to consider include regulatory compliance, trading platforms and tools, customer support, fees (including spreads and commissions), execution speed, and available markets. Traders should perform comprehensive research and due diligence when selecting a brokerage to ensure a reliable and transparent trading experience.

2.4.4 Leverage and Margin

Leverage enables traders to manage larger positions with a smaller upfront investment, which can magnify potential profits but also increasing potential losses. Margin requirements determine the amount of capital needed to open and maintain CFD positions, with brokers typically offering varying levels of leverage and margin based on the asset class and trader's account type. However, while leverage can magnify gains, it also exposes traders to significant risks. Even small adverse price movements can lead to substantial losses, sometimes taking the initial investment, if proper risk management strategies, such as stop-loss orders, are not in place

2.4.5 CFD Asset Classes

CFDs offer investors access to a wide array of asset classes without needing to own the underlying assets. Each asset class presents unique opportunities:

Stocks: Investors can speculate the price changes of publicly traded companies without directly owning the shares. Considerations include market hours, dividends, and corporate actions. When you buy a stock, you are purchasing a stake in a company. However, with Contracts for Difference

(CFDs), you are simply speculating on whether the stock price will rise or fall without actually owning the underlying shares. This allows for potential profits based on market price movements.

Foreign Currencies: Also known as Forex or FX, this involves speculating on currency pairs such as EUR/USD or CHF/USD. Factors such as market liquidity, volatility, and leverage are crucial. Forex trading involves buying and selling currencies in pairs, with traders predicting whether one currency will strengthen or weaken relative to the other.

Commodities: Commodities are raw materials like gold, oil, wheat, and coffee that are essential in everyday life. Trading commodity CFDs involves predicting whether the prices of these goods will rise or fall. Factors such global supply and demand, geopolitical events, and changes in climate affecting the change commodity prices.

Indices: Traders can speculate on the performance of stock groups representing specific markets or sectors, such as S&P 500, DAX 30. Market sentiment, economic indicators, and sector performance play key roles. An index represents a basket of stocks that reflect a specific market or sector. For instance, the S&P 500 index traces the performance of 500 big cap U.S. stocks. Trading index CFDs allows investors to speculate on the overall movement of these stock groups rather than individual stocks. Chong and Ng (2008) evaluated the MACD and RSI indicators on the London Stock Exchange index (FT30) and concluded that both indicators provided significant predictive power in specific market conditions (Chong, 2008).

Bonds: Access to government and corporate bonds enables traders to speculate on fixed-income securities. Factors like interest rates, credit ratings, and economic conditions are critical. Bonds are debt instruments issued by governments or corporations to obtain capital. Bond CFDs enable speculation on price fluctuations of these fixed-income investments without owning the actual bonds. Factors influencing bond prices include interest rates, economic conditions, and the creditworthiness of the issuer.

Cryptocurrencies: CFDs facilitate trading digital currencies like Bitcoin and Ethereum against fiat or other cryptocurrencies. High volatility and market sentiment are significant considerations. Cryptocurrencies are digital or virtual currencies that utilize blockchain technology for security. Most

known cryptocurrencies are Bitcoin and Ethereum. Trading cryptocurrency CFDs involves predicting whether the value of these digital assets will increase or decrease relative to fiat currencies like the US Dollar or other cryptocurrencies. Factors influencing cryptocurrency prices include market demand, regulatory developments, and technological advancements.

ETFs: These allow investors to trade diversified portfolios tracking indices, sectors, or asset classes. Benefits include diversification, liquidity, and cost efficiency. Exchange-Traded Funds (ETFs) are investment funds traded on stock exchanges, such as the New York Stock Exchange (NYSE). Trading ETF CFDs allows investors to speculate on the price movements of these portfolios, which hold assets such as stocks, bonds, or commodities and aim to mirror the performance of a given index or sector.

Understanding these asset classes and their dynamics is essential for making informed trading decisions. It involves analyzing factors like market trends, economic indicators, geopolitical events, and investor sentiment to sufficiently manage risks and optimize potential returns in CFD trading.

2.4.6 Regulatory Considerations

CFD trading is subject to different regulatory frameworks depending on the region. In the European Union, for instance, the European Securities and Markets Authority (ESMA) has implemented leverage restrictions to protect retail investors, limiting the maximum leverage that can be offered by brokers. Similarly, the Australian Securities and Investments Commission (ASIC) has introduced rules to reduce the risks associated with CFDs, including margin close-out protection and negative balance protection. These regulations are intended to mitigate some of the inherent risks associated with high leverage and volatile market conditions.

2.5 Technical Analysis Tools and Techniques

Technical analysis, a fundamental facet of market analysis, employs a diverse array of indicators and oscillators to decipher market trends and gauge momentum. Schwager (1996) emphasizes that for successful trading a deep understanding of technical analysis indicators is essential, with tools like MACD and moving averages offering insights into momentum and trend strength (CD Kirkpatrick II, 2010).

These tools offer crucial insights into market dynamics, helping traders and investors make well-informed decisions. Below are some commonly used indicators and oscillators:

2.5.1 Relative Strength Index (RSI)

The Relative Strength Index (RSI) represents an essential foundation within technical analysis. Wilder (1978) first introduced the Relative Strength Index (RSI), a momentum oscillator utilized for identifying overbought and oversold conditions, which has since become a fundamental tool in technical analysis (Wilder, 1978). It quantifies the speed and extent of price changes, oscillating between 0 and 100. Traders widely utilize RSI to pinpoint overbought and oversold conditions in an asset, thereby identifying potential turning points in market trends. Additionally, RSI divergences with price movements are closely scrutinized by traders to anticipate potential shifts in market direction.

An asset is considered oversold when the RSI drops below a certain threshold (typically 30), indicating potential buying opportunities. Traders may initiate long positions when the RSI crosses back above the oversold threshold, signaling a potential price reversal. (Fernando, 2024)

Conversely, an asset is deemed overbought when the RSI surpasses a specific threshold (usually 70), suggesting that the price may be facing a correction of a trend. Traders might look into selling or shorting the asset when the RSI crosses below the overbought threshold, anticipating a potential downturn as seen on figure 1.

Figure 1. RSI Indicator (Tradingview, n.d.)

2.5.2 Moving Average Convergence Divergence (MACD)

The Moving Average Convergence Divergence (MACD) serves as a pivotal directional momentum indicator. Comprising two colored lines, namely the MACD line and the signal line, MACD derives from the comparison between two exponential moving averages, typically spanning 12 and 26 days. Market participants leverage MACD crossovers and divergences to discern alterations in trend dynamics and to identify opportune moments for initiating buy or sell positions (Dolan, 2024).

A buy signal is formed when the MACD line rises above the signal line, suggesting optimistic momentum. This crossover usually reveals a potential uptrend reversal or the initiation of a new bullish trend. When bullish crossover occurs, investors should look entering long positions or add on to their existing trades.

On the contrary, a sell signal materializes as the MACD line crosses below the signal line, indicating bearish momentum. A bearish crossover suggests a potential downtrend reversal or the onset of a new downturn trend. During bearish crossovers, investors may opt to open short position or close current positions, aiming to capitalize on anticipated price declines as demonstrated in figure 2 among explanations of MACD lines and histogram.

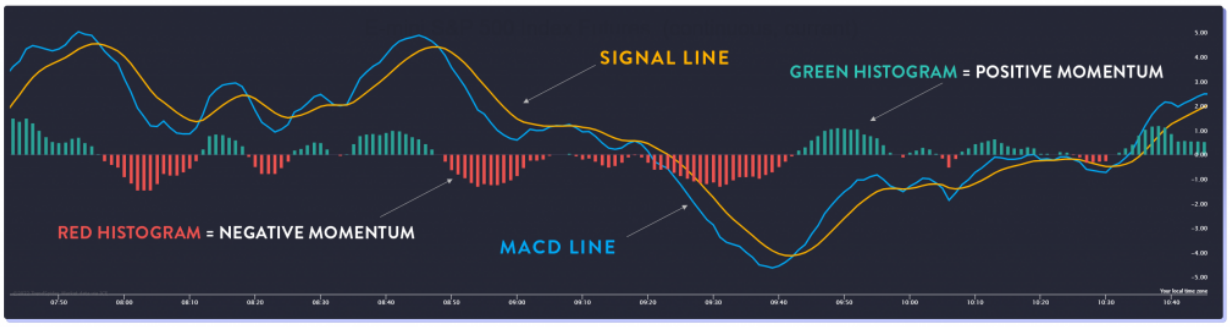

Figure 2. MACD Indicator (KRUTZKY, n.d.)

2.5.3 Fibonacci Retracement

Fibonacci retracement, rooted in the mathematical principles established by Fibonacci ratios, offers traders a method for delineating possible key levels. By implementing lines in price charts corresponding to Fibonacci values such as 23.6%, 38.2%, 50%, 61.8%, and 100%, traders ascertain probable reversal zones within trending markets. This technique assists investors seek strategic entry and exit points based on historical price movements (Mitchell, 2024).

Traders often utilize Fibonacci retracement levels as possible entrance prices for trades, especially when anticipating upcoming trend. When the price retraces to a Fibonacci level within an uptrend, traders may consider initiating long positions, anticipating a continuation of the upward movement. Conversely, during a downtrend, retracements to Fibonacci levels may present opportunities to enter short positions.

Fibonacci retracement levels also serve as indicators for potential exit points. Traders may choose to take profits or close their positions when the price approaches a significant Fibonacci level, as these levels often act as areas of support or resistance in which price reversals are likely to occur as seen in figure 3.

Figure 3. Fibonacci Retracement (Tradingview, n.d.)

2.5.4 Moving Averages

Moving averages stand as an essential tool in technical analysis. With function to smoothen price data over defined periods, enabling traders to discern prevailing trends. Widely adopted variations include the simple moving average (SMA) and the exponential moving average (EMA). Investors employ moving average crossovers and monitor price interactions with these averages to validate trend continuity and to recognize key support and resistance levels, thus enhancing their decision-making process.

Moving average crossovers, such as the crossover of a shorter-term moving average above a longer-term moving average (bullish crossover) or below (bearish crossover), are often used to confirm trend directions. A bullish crossover indicates potential upward momentum and may prompt traders to consider long positions, while a bearish crossover suggests potential downward momentum, prompting consideration of short positions.

Moving averages serve as dynamic levels of support and resistance. When the price approaches a moving average from below and rebounds, it can signify support, indicating possible buying opportunities. On the other hand, if the price approaches a moving average from above and is unable to penetrate it, this moving average may act as resistance, hinting at potential selling opportunities. Traders often utilize these levels to establish stop-loss orders and to determine the optimal timing for entering and exiting trades.

Overall, moving averages, like other indicators, should be combined with additional indicators, as shown in Figure 4

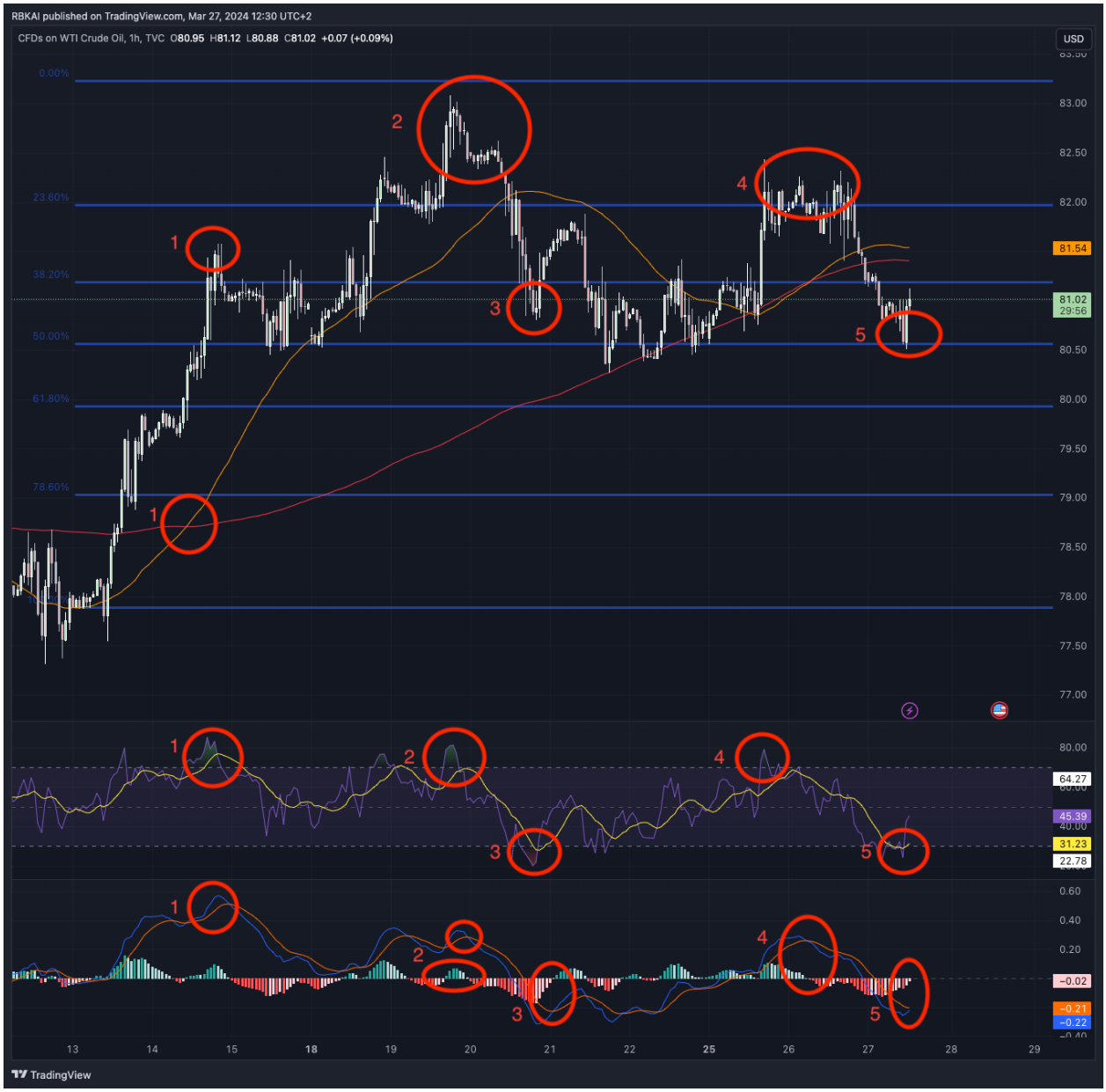

Figure 4. Combination of indicators: MACD, RSI, Moving Averages, and Fibonacci on WTI Crude Oil (USOIL) one hour chart. (Tradingview, n.d.)

2.5.5 Directional Movement Index (DMI)

The Directional Movement Index (DMI) is a technical analysis tool designed to evaluate both the strength and direction of market trends. The DMI is made up of three components: the Positive Directional Indicator (+DI), the Negative Directional Indicator (-DI), and the Average Directional Index (ADX). The Directional Movement Index is especially valuable for detecting trend reversals and signaling the onset of new trends. This indicator tends to perform better in markets characterized by frequent fluctuations between highs and lows during the analysis period (Thompson, 2024).

Positive Directional Indicator (+DI): This line measures the strength of bullish trends. When the +DI is rising, it indicates that buyers are gaining strength relative to sellers.

Negative Directional Indicator (-DI): Conversely, the -DI evaluates the strength of bearish trends. A rising -DI suggests that sellers are gaining strength relative to buyers.

The ADX measures the strength of a trend without regard to its direction. A high ADX value indicates a robust trend, while a low ADX value signifies a weak or absent trend. When the +DI is above the -DI and the ADX is increasing above 25, it may suggest a strong uptrend. Conversely, if the -DI is above the +DI and the ADX is rising, this could point to a strong downtrend.

The DMI can also generate signals for trade entries and exits. For instance, a crossover of the +DI above the -DI might indicate a bullish entry point, while a crossover of the +DI below the -DI could suggest a bearish entry point. Furthermore, traders may consider exiting a long position when the +DI crosses below the -DI and exiting a short position when the +DI crosses above the -DI. In Figure 5, the trader observes that the ADX has dropped below 25 points, signaling a weakening trend.

Figure 5. DMI Indicator (Tradingview, n.d.)

Like any technical indicator, DMI is not infallible and is prone to generate false entry signals, especially in consolidating markets. For traders its essential to combine DMI with other technical analysis tools to ensure more reliable signals.

2.6 Recognizing Trends and Current Market Condition

Understanding market trends and conditions forms the bedrock of effective technical analysis and informed trading decisions. Traders rely on several key aspects to decipher the intricacies of market dynamics and maneuver through the constantly changing financial landscape.

Central to technical analysis is the identification of market trends, which encapsulate the overall price direction over a given period. Traders employ various tools such as trendlines and moving averages to discern the prevailing trend. By recognizing uptrends, downtrends, and sideways trends, traders can align their strategies accordingly, whether it involves trend-following, countertrend trading, or range-bound strategies. As highlighted by Brock, Lakonishok, and LeBarons research technical indicators such as RSI and MACD can generate abnormal returns, although their effectiveness is highly dependent on market conditions. (Brock, 1992),

In strongly trending markets, traders often rely on trend-following strategies, using tools like moving averages to ride the wave of the prevailing trend. However, in range-bound or sideways markets, countertrend strategies may be more appropriate, as prices tend to fluctuate between key price levels. By distinguishing between these types of markets, traders can choose the right strategies and avoid being caught in false breakouts or trend reversals.

Another vital element of market analysis is the identification of significant support and resistance levels. Support levels indicate price points where buying interest exceeds selling pressure, thereby preventing further declines in prices. In contrast, resistance levels are price points where selling pressure surpasses buying interest, thereby stopping upward price movements. Traders closely monitor these levels on price charts, using them to await possible price reversals or breakout opportunities. Breakouts above resistance or breakdowns below support can signal shifts in market sentiment and provide trading opportunities for trend continuation or reversal strategies.

Support and resistance levels not only indicate possible price reversals but also serve as critical areas for establishing stop-loss and take-profit orders. Additionally, traders may look for a retest of these levels to confirm breakouts, helping to avoid premature entries or false signals. Breakouts followed by a successful retest of the broken level can provide higher-probability setups for entering a new trend as seen in figure 6.

Figure 6. Example of Support and Resistance Levels on XAU/USD on a two-hour chart. (Tradingview, n.d.)

Volatility, often referred to as the degree of variation in price movements, plays a pivotal role in creating trading approaches, risk management techniques, and position sizing. High volatility environments can present lucrative trading opportunities but also entail greater risk, requiring traders to adjust their approaching strategy. Volatility indicators, including the Average True Range (ATR) and Bollinger Bands, assist traders in assessing the degree of price fluctuations and adjusting their trading strategies according to current market conditions. In times of increased volatility, traders might choose to implement wider stop-loss orders, reduce position sizes, or utilize shorter timeframes to manage risk and take advantage of short-term price movements.

In volatile markets, traders frequently adjust their strategies by employing wider stop-loss orders or decreasing their position sizes to minimize potential losses. Tools like ATR (Average True Range) help traders set appropriate stop-loss levels by measuring the average price movement over a given period. Bollinger Bands, which expand during high volatility, can be used to anticipate potential breakouts or overextended price levels, helping traders time their entries and exits more effectively.

By comprehensively analyzing market trends, identifying crucial support and resistance levels, and considering the impact of market volatility, traders can improve their technical analysis prowess and make well-informed trading decisions. A thorough understanding of these key aspects enables traders to adjust to shifting market conditions, refine their strategies, and navigate the complexities of financial markets with confidence and proficiency.

2.7 Chart Patterns and Repetition

Chart patterns serve as invaluable tools in technical analysis, offering understanding into market psychology and recurring price movements. Chart patterns, created by price and volume data over time, provide visual representations of market dynamics and assist traders in identifying potential opportunities for profit.

2.7.1 Repetition and Cycles in Markets

Markets are inherently cyclical, characterized by recurring patterns and shifts in investor sentiment. Understanding these market cycles is essential for traders seeking to anticipate potential turning points and trend continuations, thereby enhancing their ability to make informed trading decisions. Market cycles encompass various phases, including expansion, peak, contraction, and trough, each associated with distinct price movements and investor behaviors. By recognizing the cyclical nature of markets, traders can better adapt their strategies to prevailing market conditions and capitalize on emerging opportunities. (Kenton, 2024)

Moreover, market cycles extend beyond short-term price fluctuations, encompassing broader economic and financial cycles motivated by factors such as interest rates, inflation and technological advancements. By keeping an eye macroeconomic indicator and their influence on market sentiment, traders can better understand the overall market landscape and adapt their trading strategies accordingly.

2.7.2 Head and Shoulders, Double Tops and Bottoms, Triangles

Head and Shoulders, Double Tops and Bottoms, and Triangles are among the classic chart patterns utilized by technical analysts to identify potential trend reversals or continuations.

The Head and Shoulders pattern usually forms at the top of an uptrend and is made up of three consecutive peaks, with the middle peak (the "head") being higher than the other two ("shoulders"). A neckline, drawn across the lows of the troughs between the peaks, acts as a key support level. A break below the neckline indicates a possible reversal from a bullish to a bearish trend, as shown in Figure 7.

Figure 7. Example Head and Shoulders in USD/JPY on a two-hour timeframe. (Tradingview, n.d.)

A Double Top forms when the price hits a resistance level twice without breaking above it, indicating a potential shift from a bullish to a bearish trend. In contrast, a Double Bottom occurs when the price tests a support level twice without breaking through, signaling a possible reversal from bearish to bullish. Traders typically seek confirmation from volume analysis and other technical indicators before executing trades based on these patterns. In Figure 8, we observe the market breaking the neckline, signaling the start of a new trend.

Figure 8. Example of Double Bottom in USD/JPY on a two-hour time frame. (Tradingview, n.d.)

Triangles are continuation patterns identified by the convergence of trendlines, signaling a period of consolidation before the prevailing trend resumes. Symmetrical triangles display converging trendlines with no slope bias, while ascending and descending triangles consist of one flat (horizontal) trendline and another sloping upward or downward, respectively. Breakouts from these formations typically indicate the continuation of the prior trend, offering traders opportunities to enter trades in line with the breakout, as illustrated in Figure 9.

Figure 9. Example of a Breakout in USD/JPY on a two-hour time frame. (Tradingview, n.d.)

By integrating these chart patterns into their analysis, traders aim to identify high-probability trading setups and manage risk efficiently through the use of stop-loss orders and profit targets based on anticipated price movements indicated by the patterns. Furthermore, traders often enhance their strategies by combining chart patterns with other technical indicators and fundamental analysis, thereby increasing their chances of success in fast-moving market conditions.

2.8 Research Hypotheses

Hypothesis 1: Combining multiple technical indicators and chart patterns provides more reliable trading signals than using individual indicators alone.

Hypothesis 2: Psychological factors such as emotional self-regulation significantly impact the effectiveness of technical analysis during volatile market conditions.

Hypothesis 3: The use of CFDs in trading without proper risk management leads to increased losses due to high leverage.

3 Methodology

This study investigates how effectively technical indicators such as MACD, RSI, EMA, and DMI can improve decision-making and risk management in volatile CFD trading environments. The hypothesis of this research is that combining multiple technical indicators with chart patterns, while considering psychological factors, provides more reliable trading signals than using individual indicators alone. This study adds to the ongoing discussion on technical analysis by concentrating on CFDs, a market that enables traders to speculate on price movements without holding the underlying assets. The findings seek to close the gap between theoretical technical analysis and practical trading strategies in rapidly changing market conditions.

3.1 Data Collection

The primary data for this research is sourced from TradingView, a reputable platform known for offering real-time and historical data across multiple financial markets. Its user-friendly interface and robust set of technical analysis tools facilitate an in-depth examination of market trends and patterns. The platform allows access to various asset classes, including stocks, forex, indices, and commodities, ensuring a broad scope for analysis. TradingView's interactive charts and advanced indicators, such as moving averages and trend lines, enhance the precision and reliability of the data, making it a valuable resource for the research.

3.2 Sample Selection

The study carefully selects a representative sample of securities from different asset classes to ensure diversity in market analysis. The chosen assets include:

Shares (AAPL - Apple Inc.): Apple, a globally recognized technology leader, is included for its high trading volume and market influence. It serves as a key barometer for understanding investor sentiment within the tech sector.

Forex (EUR/USD - Euro/US Dollar): The world's most traded currency pair, EUR/USD, reflects the dynamics of the foreign exchange market. It provides key insights into economic trends, global monetary policies, and geopolitical events.

Indices (SPX - S&P 500): The S&P 500 index, representing the top 500 U.S. companies, is used to monitor overall market sentiment and economic trends. It serves as a benchmark for understanding the broader stock market.

Commodities (XAU/USD - Gold): Gold, often seen as a safe-haven asset, is selected to analyze the commodities market. Its price movements provide insights into economic stability, risk appetite, and inflation expectations.

By diversifying the sample across different asset classes, the study aims to capture various market dynamics and provide a well-rounded analysis of global financial markets.

3.3 Description of Variables

The analysis focuses on several key metrics that help in identifying trading opportunities and evaluating market performance. The study applies technical analysis tools for first quarter of 2024 on a two-hour timeframe, utilizing indicators such as: Moving Average Convergence Divergence (MACD) with Exponential Moving Averages (EMA), Relative Strength Index (RSI), and Directional Moving Index (DMI).

These indicators play a crucial role in evaluating market momentum, trend direction, and identifying potential entry and exit points, forming the foundation of a strong, data-driven research framework.

4 Results

This chapter analyzes the empirical findings based on the application of technical indicators like RSI, MACD, EMA, and DMI to the chosen securities (SPX, XAU/USD, EUR/USD, AAPL) during the first quarter of 2024. The results also consider the broader context of CFD trading, including psychological factors influencing trader behavior.

4.1 Effectiveness of Indicators

The effectiveness of the technical indicators was assessed by evaluating their performance in identifying profitable trading opportunities. The analysis covered multiple assets, each presenting different market behaviors, allowing for a comprehensive assessment.

The Relative Strength Index (RSI) provided 12 trade signals, with an average return of 1.2% and a holding period of three days. Although the RSI is widely used for spotting overbought and oversold conditions, it often struggled in trending markets, producing misleading signals. For example, in the case of Gold (XAU/USD), RSI indicated overbought levels several times during an upward trend. However, these signals were premature, leading to sell decisions that resulted in missed profits as the trend continued. This supports Hypothesis 1, highlighting that the use of RSI alone can generate false signals, especially in trending markets. To mitigate this, traders who combined RSI with other indicators, such as MACD, filtered out premature sell signals, thereby enhancing the reliability of their decisions.

Additional evidence of RSI's limitations comes from the EUR/USD market, where it flagged oversold conditions just before major geopolitical events shifted the currency's value. In this case, relying solely on RSI led to unprofitable trades, further emphasizing the need for complementary analysis. This aligns with findings in Park and Irwin's study, where RSI showed inconsistent performance under different market conditions (Irwin, 2007).

The Moving Average Convergence Divergence (MACD) and Exponential Moving Average (EMA) combination was highly effective in trending markets, offering clear entry and exit points. Across the sample, three signals generated an average return of 4%, outperforming RSI-based strategies. The combination of MACD's crossovers and EMA's smoothing effects helped traders avoid market noise, particularly during periods of high volatility in the SPX (S&P 500 Index). MACD effectively captured shifts in market momentum, helping traders capitalize on short-term uptrends and avoid sharp declines.

An additional case study can be seen in AAPL (Apple Inc.), where MACD crossovers coincided with earnings reports and other company-specific events. These signals provided traders with early in-

sights into potential reversals, aligning well with Hypothesis 1, which posits that combining indicators yields more reliable results. This finding is consistent with Brock et al.'s (1992) research, which emphasizes the effectiveness of moving averages in generating abnormal returns (Brock, 1992).

Directional Movement Index (DMI) provided mixed results, proving effective in trending markets but less so in range-bound conditions. Six trading signals produced an average return of 1.7%. In Gold (XAU/USD), DMI clearly identified the start of a bullish trend, where the positive directional indicator (+DI) rose above the negative directional indicator (-DI), signaling a strong upward momentum. However, in the EUR/USD market, DMI struggled to differentiate between market noise and real trends, especially during periods of high geopolitical uncertainty. These findings validate Hypothesis 3, as CFD traders who lacked proper risk management were more likely to incur losses due to DMI's inefficacy in volatile markets.

To further illustrate DMI's strength in trending markets, its performance during high-volatility periods in SPX is worth noting. When combined with RSI, DMI offered improved trend recognition, but in isolation, it failed to provide reliable signals in choppy market conditions.

The study consistently found that the combination of technical indicators produced better results than relying on individual indicators. Traders who combined RSI and MACD in Gold (XAU/USD) achieved more accurate and profitable signals, avoiding false sell signals during upward trends. This affirms Hypothesis 1, which argues that multiple indicators filter out false positives and provide a more comprehensive market picture.

Table 1 Effectiveness of Indicators

Indicator	**Entry Opportunities**	**Average Rate of Return**	**Average Holding Period**
RSI	12	1,2%	3 days
MACD + EMA	3	4%	4 days

DMI	6	1,7%	4 days

The results suggest that technical analysis is most effective when used as part of a multi-indicator approach, with each tool compensating for the weaknesses of others. Sweeney (1988) tested several filter rules and found that under certain conditions, technical analysis rules provided excess returns, especially in less efficient markets (Sweeney, 1988). Traders who rely solely on one indicator are likely to encounter more false signals, especially in volatile or trending markets.

4.2 Securities Performance Comparison

The analysis extended across four asset classes—SPX (S&P 500 Index), XAU/USD (Gold), EUR/USD, and AAPL (Apple Inc.)—to assess the effectiveness of the technical indicators in different market environments.

The S&P 500 showed an overall return of 10.8%. However, the index's broad composition and the diverse nature of the companies within it made technical analysis challenging. RSI signals were inconsistent, particularly during periods of economic announcements, where macroeconomic factors often trumped technical signals. In contrast, MACD offered more accurate entry points during market uptrends, especially in response to Federal Reserve rate decisions. This confirms that Hypothesis 2—which emphasizes the need for integrating fundamental data like economic releases with technical signals—is essential for making informed trading decisions in broad-based indices like the S&P 500.

Gold returned 9.3%, with RSI, MACD, and DMI performing exceptionally well in this highly liquid commodity. The combination of these indicators allowed traders to accurately predict trend reversals and continuation patterns, particularly in response to geopolitical events such as rising tensions in Eastern Europe. Gold's performance highlighted the importance of technical indicators in stable, trending markets. This finding supports Hypothesis 1, as combining RSI and MACD yielded better results than using them independently.

EUR/USD performed negatively, returning -2.3%. Despite the high liquidity in the forex market, technical indicators struggled due to external factors such as Federal Reserve policy and European Central Bank announcements. While RSI generated some useful signals, these were often contradicted by fundamental news, which drove the currency's movements. This highlights the validity of Hypothesis 2, which suggests that technical analysis alone is insufficient for forex trading, where fundamental analysis plays a critical role.

Apple's stock saw a negative return of -9.5%, largely influenced by company-specific risks and external factors such as the tech sector's volatility. Although RSI and MACD provided actionable insights around earnings reports, technical analysis alone could not fully account for sharp declines driven by external market forces. This reinforces the need to integrate technical indicators with fundamental research, supporting Hypothesis 2.

Table 2 Securities and Indicator performances

Security	**Average Return**	**Avg. holding period**	**RSI**	**MACD + EMA**	**DMI**
SPX (S&P 500)	10,8%	4 days	Mixed results	Mixed signals	Less effective
XAU/USD (Gold)	9.3%	4 days	Reliable signals	Consistent performance	Effective
EUR/USD	-2,3%	3 days	More accurate	More reliable than DMI	Limited
AAPL (Apple Inc.)	-9,5%	3 days	Actionable insights	MACD reliable at key events	Less effective

4.3 Market Conditions During Findings

Market conditions during the first quarter of 2024 were significantly impacted by macroeconomic events, such as Federal Reserve announcements and economic indicators like nonfarm payrolls. These events brought heightened volatility to the markets, particularly in forex and commodities.

For instance, the U.S. dollar strengthened due to better-than-expected employment data, resulting in a sharp decline in EUR/USD. This illustrates the limitations of relying solely on technical indicators like RSI during periods of high volatility. While RSI indicated overbought conditions, fundamental factors drove the market in the opposite direction, underscoring Hypothesis 2—the need for integrating fundamental and technical analysis.

The volatility in Gold also highlighted the importance of combining technical tools with market context. While the MACD provided strong buy signals, traders who ignored geopolitical developments (e.g., rising tensions) risked missing key opportunities. Thus, aligning technical analysis with real-time news increased trading success, validating the importance of a hybrid strategy that includes fundamental analysis.

5 Discussion, Conclusions and Limitations

5.1 Discussion

The findings from this study offer important insights into the effectiveness of technical indicators in CFD trading, particularly when applied in conjunction with psychological awareness and risk management. The results strongly support Hypothesis 1, which posits that combining multiple technical indicators provides more reliable trading signals than relying on individual indicators. This was especially evident in trending markets, where the integration of RSI, MACD, and EMA allowed traders to filter out false signals and achieve more consistent returns.

For example, in the Gold (XAU/USD) market, the combination of these indicators provided a clear advantage, identifying trend continuations and reversal points more accurately than using RSI or DMI alone. This reinforces the importance of using a multi-indicator approach, particularly in assets with strong, directional movements.

In contrast, the EUR/USD market illustrated the limitations of technical analysis in isolation. Despite RSI and MACD generating signals, these were often overridden by external factors such as central bank policies and geopolitical events. This supports Hypothesis 2, emphasizing that funda-

mental analysis is essential when trading forex, where economic and political factors heavily influence price action. Traders who integrated real-time news and macroeconomic data were better positioned to anticipate price movements, highlighting the need for a hybrid strategy.

The results also shed light on Hypothesis 3, which addresses the risks associated with CFD trading. The use of leverage in CFDs can magnify losses, particularly when technical indicators provide false signals in volatile market environments. This was most evident in AAPL (Apple Inc.), where company-specific risks and external market factors led to significant losses despite technical signals suggesting potential gains. The psychological impact of leverage, particularly the temptation to "chase losses" or hold onto losing positions, underscores the importance of emotional self-regulation and disciplined risk management. De Bondt and Thaler provide evidence that the stock market tends to overreact to new information, reinforcing the idea that psychological factors can lead to mispricing (Thaler, 1985).

The study's findings align with existing literature that highlights the psychological biases influencing traders' decisions. Emotions such as fear, greed, and the desire to avoid pain can lead to irrational behavior, as evidenced in the case of traders holding onto losing positions in EUR/USD and AAPL. According to Shleifer and Summers (1990), the behavior of noise traders can significantly impact market prices, illustrating how psychological factors often lead to irrational market movements that traditional technical analysis may overlook (Shleifer, 1990). Even when technical indicators signaled exits, psychological factors often delayed action, resulting in larger-than-necessary losses. Kahneman highlight that traders often exhibit loss aversion, which can lead to holding losing positions longer than advisable, reflecting a common emotional pitfall (Kahneman, 2013).

This supports Hypothesis 2, as emotional regulation proved to be just as critical as technical analysis in ensuring successful trading outcomes. By incorporating psychological self-awareness and discipline, traders were better able to act on technical signals in a timely manner, reducing the impact of emotional biases on their performance. Kroll and Tversky (2016) highlight that cognitive biases play a crucial role in trading decisions, often leading traders to make impulsive choices that contradict technical signals (Kroll, 2016).

The key takeaway from this research is that a comprehensive approach combining technical indicators, fundamental analysis, and psychological awareness is essential for successful CFD trading. Bodie, Kane, and Marcus (2014) argue that effective investment strategies must incorporate both technical analysis and an understanding of market psychology, highlighting the need for traders to adapt their methods to varying market conditions (Bodie, 2014). Traders who rely solely on technical analysis without considering external market conditions or managing their emotions are at greater risk of making poor decisions, particularly in volatile or news-driven markets.

While technical indicators such as RSI, MACD, and DMI provide valuable insights into market trends and momentum, their effectiveness is significantly enhanced when used as part of a broader, integrated strategy. For instance, traders who combined technical indicators with fundamental analysis and risk management strategies outperformed those who relied solely on one form of analysis. This multi-faceted approach is critical in dynamic market environments like CFDs, where leverage and volatility can quickly amplify risks.

5.2 Conclusion & Limitations

In conclusion, the research confirms the importance of combining technical indicators to enhance trading performance in CFDs. The findings demonstrate that while individual indicators such as RSI or DMI can offer valuable signals, their reliability improves significantly when used together, particularly in trending markets like Gold (XAU/USD). This supports Hypothesis 1, which emphasizes the effectiveness of combining multiple technical indicators for better decision-making.

Additionally, the study emphasizes the limitations of relying solely on technical analysis, particularly in the forex market. External factors like economic data releases and central bank policies greatly influence currency movements, highlighting the necessity of integrating fundamental analysis with technical indicators. This supports Hypothesis 2, reinforcing the importance of a hybrid strategy that combines both technical and fundamental approaches.

Finally, the risks associated with CFD trading, particularly the use of leverage, were evident in the AAPL (Apple Inc.) case. Traders who did not apply proper risk management techniques or emotional discipline were more likely to incur significant losses, supporting Hypothesis 3. The findings

confirm that successful trading requires not only technical and fundamental knowledge but also psychological resilience and effective risk management.

As highlighted throughout the research, psychological factors play a critical role in trading outcomes. Emotional biases such as fear, greed, and the avoidance of loss often lead to irrational decisions, even when technical indicators provide clear signals. Feng and Seasholes (2005) suggest that while experience and sophistication reduce some behavioral biases, they do not eliminate the psychological factors that can affect trading decisions (Feng, 2005).

The following table illustrates common emotional responses that traders experience and the underlying subconscious drivers that affect decision-making:

Table 3 Emotions while holding on to a position

Action	**Conscious Reason**	**Subconscious Reason**
Letting loss run	"Indicator says so"	Avoiding pain of admitting loss
Taking profits early	"Can't go broke taking profit"	Fear of losing gains
Reducing stake after a win	"I want to play it safe"	Avoiding future losses
Increasing stake after a loss	"Trying to recover loss"	Getting rid of emotional pain
Stopping after a small gain	"Satisfied with today's profit"	Fear of losing the gains
Trading without conviction	"I might miss an opportunity"	Fear of missing out or boredom

By recognizing these emotional patterns and developing strategies to manage them, traders can improve their decision-making processes. The research confirms that psychological resilience—

defined by the ability to regulate emotional responses and adhere to rational trading strategies—is just as crucial as technical and fundamental analysis. Kasemsap (2015) examines how emotional biases, including overconfidence and loss aversion, can cloud traders' perceptions regarding market conditions, frequently resulting in suboptimal decision making and heightened risks (Kasemsap, 2015).

This research encountered several limitations that need to be recognized. First, the study focused on a specific timeframe (Q1 2024) and a select group of assets, which may restrict the applicability of the findings to other markets or periods. Future studies should consider longer timeframes and a wider range of financial instruments to offer a more thorough understanding of the effectiveness of technical analysis in various market conditions.

Additionally, the research primarily depended on historical price data to evaluate the performance of technical indicators. While this provides valuable insights, it may not entirely reflect the impact of sudden market shocks or shifts in trader behavior that can occur in real-time trading. Future studies could investigate the use of real-time trading data or incorporate advanced machine learning techniques to enhance the accuracy of technical analysis.

Finally, while psychological factors were discussed, the study did not quantify their impact on trading performance. Future research could apply behavioral finance models to better understand the role of psychological biases in trading decisions and explore strategies for mitigating their effects.

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