THE PREDICTIVE POWER OF TECHNICAL ANALYSIS: EVIDENCE FROM THE GBP/USD EXCHANGE RATE

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Abstract
This study examines the effectiveness of technical analysis in the foreign exchange market, focusing on the GBP/USD currency pair in 2019. By combining historical and granular analysis, the research leverages various technical tools, including trendlines, support and resistance levels, Fibonacci retracements, chart patterns, and candlestick formations. The study demonstrates the predictive power of these tools in identifying market trends, pinpointing potential reversals, and uncovering trading opportunities. This highlights the value of technical analysis for informed decision-making in the complex foreign exchange market.

Keywords: Financial markets, Forex market, Technical analysis, GBP/USD, Volatility.

JEL Classification: D50, D53

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1. Introduction

Individuals can make informed investment decisions by anticipating future market trends, capitalizing on opportunities, and mitigating risks, requiring a deep understanding of economics, industry dynamics, and geopolitical events, and often combining technical and fundamental analysis (Fronzetti Colladon et al., 2023). Technical analysis is a widely used methodology for predicting the future price movements of financial assets such as stocks, indices, currencies, and commodities (Ghanem et al., 2024). Instead of focusing on economic fundamentals, it assumes that all relevant information is reflected in asset prices and that historical price patterns can indicate future trends (Han et al., 2024). Key techniques include charts, trend lines, support and resistance levels, chart patterns, and technical indicators (Hassanniakalager et al., 2021). Charts, like line, bar, and candlestick types, visualise price history, while trend lines and support/resistance levels highlight market direction and psychological barriers. Indicators such as moving averages, RSI, and MACD confirm trends and generate trading signals (Oktaba & Grzywińska-Rąpca, 2024). Although valuable for identifying trends, entry/exit points, and managing risk, technical analysis relies on historical data and may be less effective in volatile or rapidly changing markets (Cohen, 2021). Its subjective nature can also lead to varying interpretations among analysts (Lakshmi & Adithya, 2024).

This study employs a comprehensive technical analysis approach to evaluate the effectiveness of analytical tools in the foreign exchange market, focusing specifically on the GBP/USD currency pair during the calendar year 2019. The research methodology integrates a sophisticated blend of quantitative and graphical analysis techniques, meticulously designed to provide nuanced insights into market dynamics. Secondary data was systematically extracted from the Tradingview platform, with the GBP/USD exchange rate pair selected based on scholarly recommendations from Hassanniakalager et al. (2021), who underscored the pair's significant economic importance and pronounced volatility characteristics. The research adopted a multi-tiered temporal approach to ensure comprehensive market analysis. A broad historical context was established using an extensive weekly timeframe spanning from 3 May 1993 to 31 December 2018, enabling the identification of long-term market trends and structural patterns. This was followed by a granular daily timeframe analysis to conduct an in-depth examination of the pair's behaviour throughout 2019. Multiple sophisticated technical analysis tools were integrated into the study, including trend identification and analysis, support and resistance level mapping, Fibonacci retracement techniques, graphical pattern recognition, candlestick pattern evaluation, and price breakout analysis. The analytical procedure followed a systematic five-stage protocol. Firstly, the GBP/USD currency pair was selected due to its demonstrated market volatility and economic significance. The second stage involved a comprehensive analysis of historical price movements to establish foundational support and resistance levels and identify prevailing market trends. In the third stage, an in-depth evaluation of 2019 price movements was conducted to assess the predictive and interpretative potential of the previously identified technical levels. The fourth stage entailed a rigorous examination of various technical indicators, including chart patterns, candlestick formations, and price breakout configurations. Finally, the research concentrated on the analysis of reversal candlestick patterns, traditionally used as critical indicators for market entry points. This study offers several methodological contributions. It develops a robust multi-timeframe analytical framework and demonstrates the comprehensive integration of diverse technical analysis tools. Additionally, it provides a systematic approach to pattern recognition and market trend interpretation. The study empirically validates the effectiveness of technical analysis in navigating the complexities of currency markets, highlighting its utility for informed decision-making in trading strategies.

2. Literature Review

The Forex market is renowned for its accessibility and popularity, as highlighted by Juszczuk and Kruś (2017). It stands as the world's largest financial market, with daily transactions exceeding $6.6 trillion in 2019, according to the Bank for International Settlements (BIS) (Schrimpf & Sushko, 2019). Pongsena et al. (2021) further underscore its economic significance and unparalleled scale. Within this market, technical and fundamental analysis play pivotal roles as core components of rule-based

trading systems, enabling traders to generate buy and sell signals by analysing historical price data and economic indicators (Juszczuk & Kruś, 2017). Technical analysis has been widely explored as a tool for predicting price movements. Zheng (2023) highlights its reliance on historical data and technical indicators to identify potential buying and selling opportunities, acknowledging its limitations and the need for a comprehensive investment strategy. Chart patterns, such as triangles, flags, head and shoulders, and double tops or bottoms, are particularly valuable for identifying trend continuations or reversals, as noted by Akbarzadeh and Soleimani (2023). Reversal patterns, including head and shoulders and double tops/bottoms, provide further insights into potential trend shifts (Zheng, 2023). Specific tools such as Fibonacci retracement are crucial for identifying support and resistance levels, aiding traders in making informed decisions (Tsinaslanidis et al., 2022; Sethi et al., 2020). Japanese candlesticks, which visually represent price movements, are also emphasised for their role in identifying trend reversals, continuations, and key price levels (Cohen, 2021; Heinz et al., 2021). Meanwhile, breakouts are highlighted by Yu and Li (2021) for their potential to signal significant price shifts and trading opportunities. Advanced methodologies have further enhanced technical analysis. Neural networks, as Rundo et al. (2019) argue, capture complex price patterns, enabling more accurate predictions and investment decisions. Similarly, machine learning techniques, introduced by Jiang et al. (2023), have demonstrated superior predictive capabilities compared to traditional approaches. AI-driven tools are increasingly central to market prediction and decision-making, benefiting both traders and policymakers by improving market stability (Bartram et al., 2020; Pongsena et al., 2021). Research has also explored the optimisation of trading strategies. Vezeris et al. (2018) demonstrated that refining Take Profit and Stop Loss parameters in a MACD-based trading system significantly enhances performance. Moreover, the challenges of measuring investor sentiment and the need for advanced techniques are addressed by Cookson and Niessner (2020).

3. Methodology

The study conducted an in-depth technical analysis to evaluate the effectiveness of analytical tools in the foreign exchange market, focusing specifically on the GBP/USD currency pair during the year 2019. Employing a sophisticated integration of quantitative and graphical analysis techniques, the research was meticulously designed to provide nuanced insights into market dynamics. Data was systematically sourced from the Tradingview platform, with the GBP/USD pair strategically chosen based on recommendations from Roy Trivedi (2022) and Darvas & Schepp (2024), who emphasised the pair's economic significance and notable volatility. To ensure a comprehensive market analysis, the study adopted a multi-tiered temporal approach. A broad historical perspective was established using an extended weekly timeframe spanning from 3 May 1993 to 31 December 2018, enabling the identification of long-term market trends and structural patterns. This was complemented by a detailed daily timeframe analysis, which examined the pair's behaviour throughout 2019 in greater depth. The research integrated a range of sophisticated technical analysis tools to enhance its analytical scope.

These included trend identification and analysis, mapping of support and resistance levels, Fibonacci retracement techniques, graphical pattern recognition, candlestick pattern evaluation, and price breakout analysis. The analytical procedure followed a structured five-stage protocol. In the first stage, the GBP/USD pair was deliberately selected due to its economic importance and market volatility. The second stage involved a comprehensive analysis of historical price movements, establishing foundational support and resistance levels while identifying prevailing trends. The third stage focused on a detailed evaluation of the pair’s price movements during 2019, assessing the predictive and interpretative relevance of previously identified technical levels. In the fourth stage, the research undertook a rigorous examination of technical indicators, including chart patterns, candlestick formations, and breakout configurations. Finally, the study concentrated on the analysis of reversal candlestick patterns, recognised as critical indicators for identifying market entry points. By combining a robust methodology with diverse technical tools, the study offered valuable insights into the utility of technical analysis in navigating the complexities of the GBP/USD currency market.

4. Results

This currency pair has exhibited a persistent downward trend since 2008. Figure 1 highlights this long-term descending trendline (red line). However, for the specific context of 2019, this trendline is not directly relevant as it remains well above the fluctuation range observed during the analysed period. Examining recent years reveals a historical low point reached in 2016, followed by a partial recovery that extended until 2018. After this period, the pair resumed its decline. In the year under study, the pair fluctuated within the range of 1.35160 to 1.19600. As illustrated in Figure 1, the currency pair initially followed an upward trajectory early in the year, maintaining this ascent until mid-March. During this period, the price approached a key resistance level at 1.33683 but failed to break through. This inability to surpass the resistance marked the start of a downward movement, which extended through to September, culminating in the lowest price recorded for the year. At this point, the price found support at the 1.20152 level, where it rebounded, initiating an upward movement that continued until the year's peak in December. Throughout this period, former resistance and support zones maintained their influence on price movements, continuing to act as critical points of resistance and support. A more detailed trend analysis reveals that, from the beginning of the year until late April, the price adhered to an ascending trendline identified as LTA1. However, upon breaking this trendline, the price retraced to retest it, in line with the observation by Pring (2014) that an ascending trendline, once broken, tends to act as resistance. Following this retest, the price entered a downward phase characterised by two observable descending trendlines. The first descending trendline, LTD1, was less steep and acted as resistance from March until October, at which point it was breached. The second, LTD2, was steeper and confined the price movement more tightly, restraining it between May and September. In both cases, these trendlines were respected by the price and played a role as resistance throughout the downward trajectory. Towards the year's end, a new ascending trendline (LTA2) emerged, providing support for the price during the final two months of 2019. This trendline helped stabilise the price as it began a moderate upward movement. In summary, 2019 was marked by dynamic price fluctuations within a defined range, influenced by key resistance and support levels as well as identifiable trendlines. Each of these elements played a significant role in guiding price behaviour, underscoring the continued relevance of technical analysis tools in understanding market movements.

Figure 1 – GBP/USD Trends

Source: Own elaboration on the Tradingview platform

Following the break of LTD2, Figure 2 illustrates the formation of a Head and Shoulders (HS) pattern, which does not fully adhere to the established criteria for such patterns. According to the principles outlined by Pring (2014) and Eugster Uhl (2023), an HS pattern typically requires a noticeable increase in trading volume during the development of the first shoulder and the head, reflecting heightened market activity. However, in this instance, the volume remains stable throughout the formation of the pattern, failing to meet this essential condition. Additionally, the price does not break below the neckline, which is a critical requirement for confirming the validity of an HS pattern. Without this downward movement, the expected bearish signal associated with this formation cannot be considered reliable. Consequently, while the visual resemblance to an HS pattern is present, its failure to meet these fundamental criteria renders it invalid for practical analysis or decision-making.

Figure 2 - Head & Shoulders GBP/USD

Source: Own elaboration on the Tradingview platform

In addition to the incomplete Head and Shoulders (HS) pattern, a double top formation is observed during the year under analysis. This pattern occurs during a correction within a downward movement, as the price is not ready to initiate an upward trend. The double top is characterised by two peaks at approximately the same level, separated by a trough in between (Fernández & Crespo, 2022). Following some indecision around the trough, which aligns with the resistance level of 1.25226, the price ultimately breaks downward in an impulsive movement, as shown in Figure 3. This behaviour confirms the bearish implications of the double top pattern, reinforcing its reliability in identifying potential reversals within a broader downtrend. The occurrence of this pattern highlights the importance of recognising key resistance levels and the subsequent price action for effective trend analysis and forecasting.

Figura 3 – Double Top GBP/USD

Source: Own elaboration on the Tradingview platform

During the year under analysis, three continuation patterns were identified, as illustrated in Figure 4. The first occurred during an upward movement, where a flag pattern formed. According to Ghanem et al. (2024), this pattern creates a parallelogram that points in the opposite direction of the trend. After completing its formation, the price broke through the structure and resumed its initial upward trajectory. At the end of July and the beginning of August, during a downward movement, the price consolidated within a symmetrical triangle. As noted by Singh (2021), this is the most prevalent continuation pattern in charts. Formed by two converging lines, the price oscillated between them until breaking the structure and continuing the downward movement. Towards the end of the year, during another upward movement, a rectangle pattern emerged. The price consolidated for several weeks within this structure before breaking out and resuming the initial upward trend. Similarly to the analysis of the previous pair, Figure 4 highlights bearish reversal patterns in red and bullish reversal patterns in green. In this pair, fewer patterns were observed overall. Following bearish reversal patterns, the price typically decreased as anticipated. However, bullish reversal patterns showed a less

consistent outcome. As previously discussed, Ghanem et al. (2024) emphasises that reversal patterns should only be considered if they occur in key areas of reversal, such as trendlines, channels, support/resistance zones, pattern boundaries, or Fibonacci retracement levels. This analysis reinforces the importance of recognising chart patterns within the context of significant technical areas, as they provide better reliability and predictive value. The observed continuation patterns aligned well with their theoretical behaviours, supporting their utility in trend analysis. Conversely, the fewer reversal patterns and their occasional inconsistency underscore the necessity of incorporating broader contextual elements for accurate interpretation (Sin, 2023).

Figure 4 – Continuation Patterns GBP/USD

Source: Own elaboration on the Tradingview platform

Upon the breakdown of the Long-Term Ascending (LTA) trend and disruption of its upward momentum, the Fibonacci retracement method is systematically applied to identify potential price retracement zones. In this specific market scenario, illustrated in Figure 5, the most significant Retracement Bands (RB) demonstrate critical influence on price dynamics, functioning simultaneously as resistance and support levels. The analysis reveals that at the 23.6% Fibonacci retracement level, a significant resistance zone emerges, precipitating a subsequent bearish price movement. This precise interaction between Fibonacci levels and price action underscores the method's analytical potency in technical market analysis. The strategic identification of these retracement zones enables traders to anticipate potential price reversals, manage risk more effectively, and develop more informed trading strategies by leveraging the mathematical precision of Fibonacci retracement techniques.

Figure 5 - Fibonacci Retracement I GBP/USD

Source: Own elaboration on the Tradingview platform

Upon the breakdown of the Long-Term Descending (LTD) trend, the Retracement Band (RB) method is systematically reapplied, as illustrated in Figure 6 and substantiated by Cohen (2023) research. This analytical approach critically examines the most significant retracement zones, which simultaneously function as resistance and support levels in market dynamics. In this specific scenario, the price encounters robust support at the 23.6% retracement zone. Despite the initial trend breakdown, the market demonstrates resilience, initiating an unexpected bullish movement that progressively develops momentum. This ascendant trajectory ultimately culminates at the 100% retracement level, exemplifying the complex and nuanced nature of market behaviour. The observed price action underscores the sophisticated predictive potential of Fibonacci retracement techniques, offering traders a mathematically grounded methodology for anticipating potential market reversals and understanding intricate trend mechanisms (Dumiter & Turcaş, 2023).

Figure 6 - Fibonacci Retracement II GBP/USD

Source: Own elaboration on the Tradingview platform

5. Conclusions

The analysis of this currency pair throughout 2019 reveals a complex and dynamic market environment, demonstrating the sophisticated interplay of technical analysis methodologies (Ni, 2024). This study makes several significant contributions to understanding market behaviour and technical analysis. The research developed a robust methodological approach that integrates multiple technical analysis techniques, including trendline identification and analysis, pattern recognition, Fibonacci retracement methods, and support and resistance zone mapping (Cohen, 2023 and Ghanem et al., 2024). The study introduced a rigorous framework for validating technical patterns, particularly highlighting the limitations of traditional pattern recognition. For instance, the Head and Shoulders pattern analysis demonstrated the critical importance of volume and structural integrity in pattern confirmation (Zheng, 2023). The research substantiated the predictive potential of Fibonacci retracement techniques, revealing their capacity to identify critical price reversal zones, provide mathematically grounded risk management strategies, and offer nuanced insights into market momentum and potential trend reversals (Tsinaslanidis et al., 2022). The currency pair exhibited a persistent downward trend with notable fluctuations, with price movements consistently influenced by established resistance and support levels (Tripathi et al., 2021). Multiple trendlines and continuation patterns were identified and analysed. continuation patterns demonstrated high predictability, while reversal patterns showed less consistent outcomes, emphasizing the need for contextual analysis and the importance of examining patterns within broader technical areas (Charles, 2018). The study reinforces existing technical analysis theories, particularly Pring's (2014) and principles of pattern recognition, Chen's (2010) research on market behaviour and pattern formation, and the critical role of mathematical and geometric approaches in market analysis (Karatas & Unal, 2021). For traders, it generates strategic insights through enhanced understanding of market trend mechanisms, improved risk management through precise zone identification, and more informed trading strategy development (Dumiter & Turcaş, 2023). The analytical methodology demonstrated the value of multi-dimensional technical analysis, highlighted the importance of contextual interpretation, and emphasized the need for comprehensive pattern validation (Khattak et al., 2023). This research provides a comprehensive exploration of technical analysis methodologies, offering

valuable insights into currency pair market dynamics by integrating multiple analytical approaches. The sophisticated analytical framework developed herein contributes to academic understanding and provides practical tools for traders and financial analysts. The findings underscore the importance of a holistic, mathematically grounded approach to market analysis. Future research should expand the analytical timeframe, incorporate advanced statistical and machine learning techniques, refine pattern recognition algorithms, and conduct cross-market comparisons to enhance our understanding of market dynamics and predictive modeling.

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