

ABSTRACT

Salsabila, NIM 7213250016. *Implementation of an Expert Advisor with Multi-Indicator Optimization (SMA, RSI, and Donchian Channel) Using Walk-Forward Analysis for EUR/USD Trading in MetaTrader 5.*

This research aims to implement an *Expert Advisor (EA)* based on the combination of three technical indicators — *Simple Moving Average (SMA)*, *Relative Strength Index (RSI)*, and *Donchian Channel* — by applying the *Walk-Forward Analysis (WFA)* method to evaluate trading strategy stability on the *EUR/USD* currency pair in *MetaTrader 5*. The *EA* development process followed a *Research and Development (R&D)* approach using the *V-Model*, consisting of design, optimization, backtesting, and real-time testing stages. The results show that the combination of these indicators improves signal accuracy and strategy effectiveness, with the best performance on the *H1* time frame. The developed *EA* achieved a profit factor greater than 1.0, low drawdown, and a stable win rate. The multi-indicator breakout strategy effectively detects trend direction and reduces false signals, although its performance decreases in sideways markets. Descriptive statistical analysis revealed that walk-forward testing provides more adaptive performance compared to conventional backtesting. Overall, this study demonstrates that the integration of *SMA*, *RSI*, and *Donchian Channel* with *WFA* optimization enhances the stability and adaptability of the *EA* in forex market dynamics and contributes to the development of automated trading systems based on technical analysis.

Keywords: *Expert Advisor, Simple Moving Average, Relative Strength Index, Donchian Channel, Forex Trading, MetaTrader 5, EUR/USD*

ABSTRAK

Salsabila, NIM 7213250016. Implementasi *Expert Advisor* Dengan Optimasi *Multi-Indikator (Sma, Rsi, Dan Donchian Channel)* Menggunakan *Walk-Forward Analysis* Untuk *Trading Eur/Usd* Di *Metatrader 5*.

Penelitian ini bertujuan untuk mengimplementasikan *Expert Advisor* berbasis kombinasi tiga indikator teknikal, yaitu *Simple Moving Average* (SMA), *Relative Strength Index* (RSI), dan *Donchian Channel*, dengan penerapan metode *Walk-Forward Analysis* (WFA) untuk menguji stabilitas strategi trading pada pasangan mata uang EUR/USD di platform MetaTrader 5. Pengembangan EA dilakukan menggunakan pendekatan *Research and Development* (R&D) dengan model V mencakup tahap desain, pengujian, optimasi, serta evaluasi hasil backtesting dan real-time testing. Hasil penelitian menunjukkan bahwa kombinasi tiga indikator tersebut mampu meningkatkan akurasi sinyal dan efektivitas strategi, dengan performa terbaik pada time frame H1. EA yang dikembangkan memiliki nilai profit factor di atas 1,0, drawdown yang rendah, serta win rate yang stabil. Strategi breakout berbasis multi-indikator juga terbukti efektif dalam mengidentifikasi arah tren utama dan meminimalkan false signal, meskipun performanya menurun pada kondisi pasar sideways. Analisis statistik deskriptif menunjukkan bahwa hasil walk-forward testing lebih adaptif terhadap perubahan pasar dibandingkan hasil backtesting konvensional. Secara keseluruhan, penelitian ini membuktikan bahwa penggunaan kombinasi indikator SMA, RSI, dan *Donchian Channel* dengan optimasi WFA dapat meningkatkan stabilitas dan adaptabilitas *Expert Advisor* terhadap dinamika pasar forex serta memberikan kontribusi terhadap pengembangan sistem trading otomatis berbasis analisis teknikal.

Kata kunci: *Expert Advisor, Simple Moving Average, Relative Strength Index, Donchian Channel, Forex Trading, MetaTrader 5, EUR/USD*