

## ABSTRAK

**Modento L.T.S Naibaho, NIM: 7203550001. "Pengembangan Expert Advisor Berdasarkan Indikator Moving Average, Relative Strength Index, Dan Bollinger Bands dalam Perdagangan Forex EUR/USD di MT5."**

Penelitian ini bertujuan untuk mengembangkan Expert Advisor (EA) yang dapat melakukan transaksi otomatis di *market forex EUR/USD* dengan memanfaatkan analisis teknikal berbasis indikator *Moving Average (MA)*, *Relative Strength Index (RSI)*, dan *Bollinger Bands (BB)*. EA dirancang untuk membantu *trader* dalam merancang rencana *trading* yang terstruktur, mengelola risiko dengan lebih baik, dan mengurangi dampak aspek psikologis seperti ketakutan dan keserakahan dalam pengambilan keputusan *trading*. Metode penelitian yang digunakan adalah *Research and Development (R&D)* dengan mengikuti model *waterfall*. Data yang digunakan berasal dari broker Deriv, meliputi harga historis pasangan mata uang EUR/USD dari tahun 2019 - 2024. Pengembangan EA dilakukan di platform MetaTrader 5 (MT5) menggunakan MetaEditor 5 dan bahasa pemrograman MetaQuotes Language 5 (MQL5). Hasil backtesting EA menunjukkan kinerja yang baik dengan rasio *sharpe* berkisar antara 0,48 hingga 1,14, *profit factor* antara 1,77 hingga 1,96, dan *expected payoff* antara 7,9 hingga 11,84. Uji T independen dilakukan untuk membandingkan kinerja EA pada *backtesting* dan *real time testing*. Pada skenario pertama (*time frame M30*), hasil Uji T menunjukkan tidak ada perbedaan signifikan dalam profit ( $p = 0,754$ ) dan *balance* ( $p = 0,111$ ), namun terdapat perbedaan signifikan dalam *total deal trade* ( $p = 0,035$ ). Pada skenario kedua (*time frame H1*), hasil Uji T menunjukkan tidak ada perbedaan signifikan dalam *profit* ( $p = 0,809$ ), *total deal trade* ( $p = 0,066$ ), dan *balance* ( $p = 0,186$ ). Pada skenario ketiga (*time frame H4*), hasil Uji T menunjukkan tidak ada perbedaan signifikan dalam profit ( $p = 0,755$ ), *total deal trade* ( $p = 0,127$ ), dan *balance* ( $p = 0,094$ ). Secara keseluruhan, hasil penelitian menunjukkan bahwa EA yang dikembangkan mampu menghasilkan kinerja yang konsisten dan menguntungkan dalam *trading forex EUR/USD*, dengan tidak adanya perbedaan signifikan antara *backtesting* dan *real time testing* pada sebagian besar skenario yang diuji.

***Kata kunci: Expert Advisor, Trading Forex, Moving Average, Relative Strength Index, Bollinger Band, Uji T, MetaTrader 5.***

## ABSTRACT

**Modento L.T.S Naibaho, NIM: 7203550001. "The Development of Expert Advisor Based on Moving Average, Relative Strength Index, And Bollinger Bands Indicators in Forex Trading EUR/USD on MT5."**

*This research aims to develop an Expert Advisor (EA) that can perform automatic transactions in the EUR/USD forex market by utilizing technical analysis based on the Moving Average (MA), Relative Strength Index (RSI), and Bollinger Bands (BB) indicators. The EA is designed to assist traders in developing a structured trading plan, managing risk more effectively, and reducing the impact of psychological aspects such as fear and greed in trading decision-making. The research method used is Research and Development (R&D) following the waterfall model. The data used is sourced from the Deriv broker, including historical price data for the EUR/USD currency pair from 2019 to 2024. The EA development is carried out on the MetaTrader 5 (MT5) platform using MetaEditor 5 and the MetaQuotes Language 5 (MQL5) programming language. The results of the EA backtesting show good performance with a Sharpe ratio ranging from 0.48 to 1.14, a profit factor between 1.77 and 1.96, and an expected payoff between 7.9 and 11.84. An independent T-test is performed to compare the EA's performance during backtesting and Real-Time Testing. In the first scenario (M30 time frame), the T-test results show no significant difference in profit ( $p = 0.754$ ) and balance ( $p = 0.111$ ), but there is a significant difference in total trade deals ( $p = 0.035$ ). In the second scenario (H1 time frame), the T-test results show no significant difference in profit ( $p = 0.809$ ), total trade deals ( $p = 0.066$ ), and balance ( $p = 0.186$ ). In the third scenario (H4 time frame), the T-test results show no significant difference in profit ( $p = 0.755$ ), total trade deals ( $p = 0.127$ ), and balance ( $p = 0.094$ ). Overall, the research results indicate that the developed EA is capable of producing consistent and profitable performance in EUR/USD forex trading, with no significant difference between backtesting and Real-Time Testing in most of the tested scenarios.*

**Keywords: Expert Advisor, Forex Trading, Moving Average, Relative Strength Index, Bollinger Bands, T-Test, Metatrader 5.**