Mean Reversion strategy using Maxwell Distribution

- Adarsh Kumar

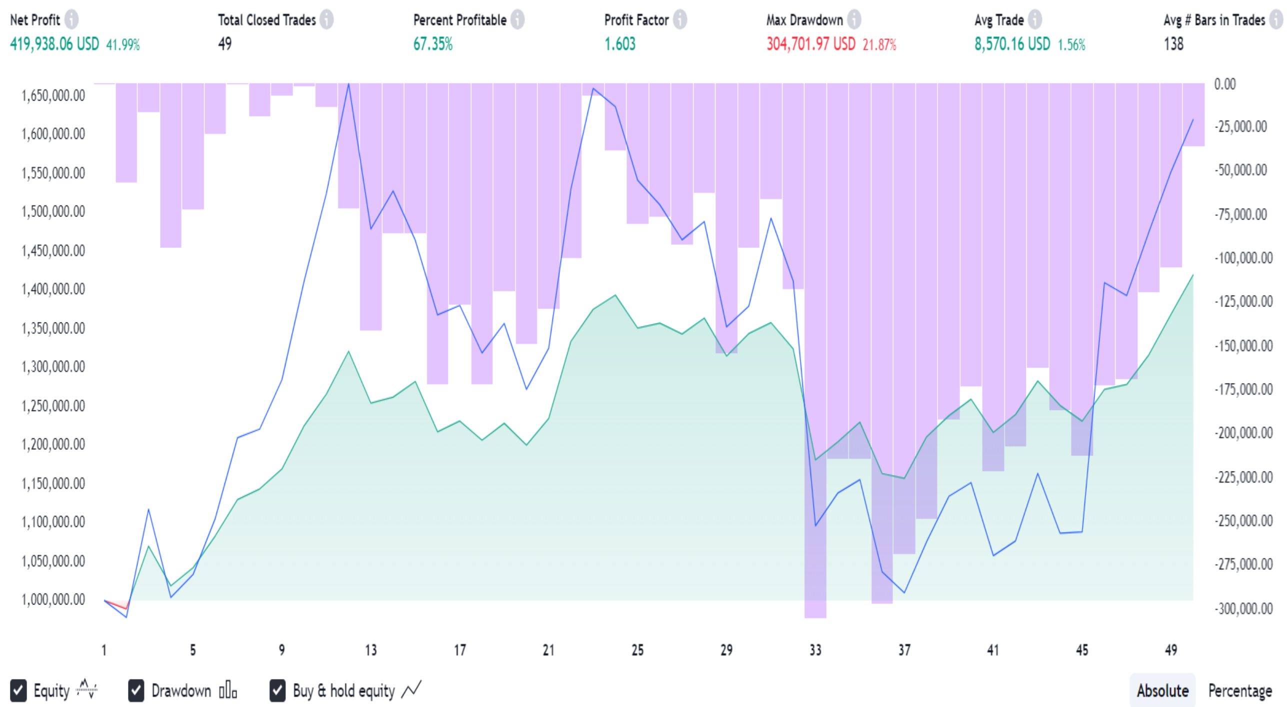
Code:

```
//@version=5
strategy("Maxwell Distribution Strategy (Buy & Exit Signals with Stop Loss)", overlay=true)

// Input parameters
ma_period = input.int(44, title="Moving Average Period")
scale_param = input.float(44, title="Scale Parameter for Maxwell Distribution")
buy_threshold = input.float(0.1, title="Buy Threshold (CDF)")
sell_threshold = input.float(0.9, title="Sell Threshold (CDF)")
stop_loss_pct = input.float(50, title="Stop Loss (%)")  // 50% stop loss
cooldown_period = input.int(60, title="Sell Cooldown (bars)")

// Variables
var int last_sell_bar = na

// Close prices and moving average
close_price = close
moving_average = ta.sma(close, ma_period)

// Deviation from the moving average
deviation = close_price - moving_average

// Maxwell distribution approximation (scaled deviation squared for simplicity)
cdf = 1 - math.exp(-(deviation / scale_param) * (deviation / scale_param))
```

```
// RSI for additional filtering
rsi = ta.rsi(close, 14)

// Buy and Sell signals based on CDF thresholds and filters
buy_signal = cdf < buy_threshold
sell_signal = (cdf > sell_threshold) and (rsi > 70) and (na(last_sell_bar) or (bar_index - last_sell_bar > cooldown_period))

// Position size: 50% of balance
position_size = (strategy.equity * 0.50) / close_price

// Entry logic for Buy
if buy_signal
    strategy.entry("Buy", strategy.long, qty=position_size)

// Exit logic for Sell
if sell_signal
    strategy.close("Buy", comment="Sell Signal")
    last_sell_bar := bar_index

// Stop-loss calculation
var float long_stop_loss = na
if strategy.position_size > 0  // Long position
    long_stop_loss := strategy.position_avg_price * (1 - stop_loss_pct / 100)
    if close_price <= long_stop_loss
        strategy.close("Buy", comment="Stop Loss")

// Plot moving average
plot(moving_average, color=color.blue, title="Moving Average")
```

```
// Plot stop-loss levels
plot(strategy.position_size > 0 ? long_stop_loss : na, color=color.red, title="Long Stop Loss",
linewidth=1, style=plot.style_line)

// Buy signal marker
plotshape(buy_signal, style=shape.labelup, location=location.belowbar, color=color.green,
size=size.small, text="Buy", title="Buy Signal")

// Sell signal marker
plotshape(sell_signal, style=shape.labeldown, location=location.abovebar, color=color.red,
size=size.small, text="Sell", title="Sell Signal")
```

Strategy Overview:



Performance Summary:

Maxwell Distribution Strategy (Buy & Sell...

Deep Backtesting

Overview | Performance Summary | List of Trades | Properties

Title	All	Long	Short
Net Profit	419,938.06 USD 41.99%	419,938.06 USD 41.99%	0 USD 0.00%
Gross Profit	1,116,512.04 USD 111.65%	1,116,512.04 USD 111.65%	0 USD 0.00%
Gross Loss	696,573.98 USD 69.66%	696,573.98 USD 69.66%	0 USD 0.00%
Max Run-up	483,577.72 USD 32.84%		
Max Drawdown	304,701.97 USD 21.87%		
Buy & Hold Return	594,044.64 USD 59.40%		
Sharpe Ratio	0.407		
Sortino Ratio	1.181		
Profit Factor	1.603	1.603	N/A
Max Contracts Held	249	249	0
Open PL	−8,738.70 USD −0.62%		
Commission Paid	0 USD	0 USD	0 USD
Total Closed Trades	49	49	0
Total Open Trades	1	1	0

Title	All	Long	Short
Total Closed Trades	49	49	0
Total Open Trades	1	1	0
Number Winning Trades	33	33	0
Number Losing Trades	16	16	0
Percent Profitable	67.35%	67.35%	N/A
Avg Trade	8,570.16 USD 1.56%	8,570.16 USD 1.56%	N/A
Avg Winning Trade	33,833.70 USD 5.64%	33,833.70 USD 5.64%	N/A
Avg Losing Trade	43,535.87 USD 6.84%	43,535.87 USD 6.84%	N/A
Ratio Avg Win / Avg Loss	0.777	0.777	N/A
Largest Winning Trade	99,477.46 USD 16.39%	99,477.46 USD 16.39%	N/A
Largest Losing Trade	143,045.38 USD 21.61%	143,045.38 USD 21.61%	N/A
Avg # Bars in Trades	138	138	0
Avg # Bars in Winning Trades	88	88	0
Avg # Bars in Losing Trades	242	242	0
Margin Calls	0	0	0