

Cryptocurrency Trading

Furqan Hashim

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1 Introduction

This document intends to walk through the steps of building a profitable trading strategy for cryptocurrency. Backtesting would be performed on each strategy on an interval of 3, 6 & 12 months to validate the results. For research purpose the data for minute bars is extracted from Binance Exchange using the API provided by Binance.

2 Rules and Assumptions

In this section we would set some rules and assumptions before entering the playing field to make better judgments on our results.

- All orders are placed using Order Cancel Order(OCO) Approach.
- We use only 90% of the available cash to open any position.
- Only a single position is taken at any given point in time. If we take a long position we do not open a new short position until and unless the long position is closed.
- Suppose we open a Limit buy order a Stop loss (Sell Order) & Take Profit (Sell order) is also opened where Limit buy order is valid up to 3 hours from execution while Stop Loss and Take profit orders are valid up to 6 hours from execution.
- As mentioned above similar case applicable when a short position is taken.
- In case of order expiry as mentioned in above two pointers all open position are liquidated at the next tick.
- Broker commission is set at 0.0750% for taking any position(maker/taker).
- Yearly backtest period: Jan'18 to Dec'18.
- Bi-annual backtest period: Jan'19 to Jun'19.
- Quarterly backtest period: Oct'17 to Dec'17.

3 Strategy I

In this approach we would make use of Simple Moving Average (SMA) along side Williams %R to generate buy and sell signals.

- Simple moving average is computed on two windows 120 & 60 minutes referred as slow and fast respectively. As the cross over exceeds 0 as buy signal is generated and vice versa.
- William's %R a momentum indicator is used along side a cross-over strategy to confirm if there is an emerging change in trend.
- If the the William's %R value is below -70 a buy signal is generated, however a sell signal is only generated if the value is above -20 .

Period	Total Trades	Long Trade	Long Trade Won	Long Trade Lost	Short Trade	Short Trade Won	Short Trade Lost	Win %age
Yearly	125	61	44	17	64	32	32	60.80%
Bi-annual	47	14	9	5	33	19	14	59.57%
Quarterly	43	11	8	3	32	15	17	53.48%

All relevant stats for each time period can found below links.

- Yearly Results & Plot
- Bi-annual Results & Plot
- Quarterly Results & Plot

4 Strategy II

In this approach we would make use of Exponential Moving Average (EMA) along side Williams %R to generate buy and sell signals. The reason to use EMA over SMA is that it gives more weightage to most recent prices.

- Exponential moving average is computed on two windows 120 & 60 minutes referred as slow and fast respectively. As the cross over exceeds 0 as buy signal is generated and vice versa.
- William's %R a momentum indicator is used along side a cross-over strategy to confirm if there is an emerging change in trend.
- If the the William's %R value is below -70 a buy signal is generated, however a sell signal is only generated if the value is above -10 .
- In this scenario for short trades position is liquidated sooner, approximately if 1% profit is achieved the trade is closed.

Period	Total Trades	Long Trade	Long Trade Won	Long Trade Lost	Short Trade	Short Trade Won	Short Trade Lost	Win %age
Yearly	26	25	15	10	1	0	1	57.69%
Bi-annual	10	7	3	4	3	2	1	50%
Quarterly	10	8	3	5	2	1	1	40%

All relevant stats for each time period can found below links.

- Yearly Results & Plot
- Bi-annual Results & Plot
- Quarterly Results & Plot

References

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- [2] Backtrader - www.backtrader.com
- [3] Investopedia - www.investopedia.com
- [4] TA-Lib - mrjbq7.github.io/ta-lib