Vector Auto Regression for Cryptocurrencies

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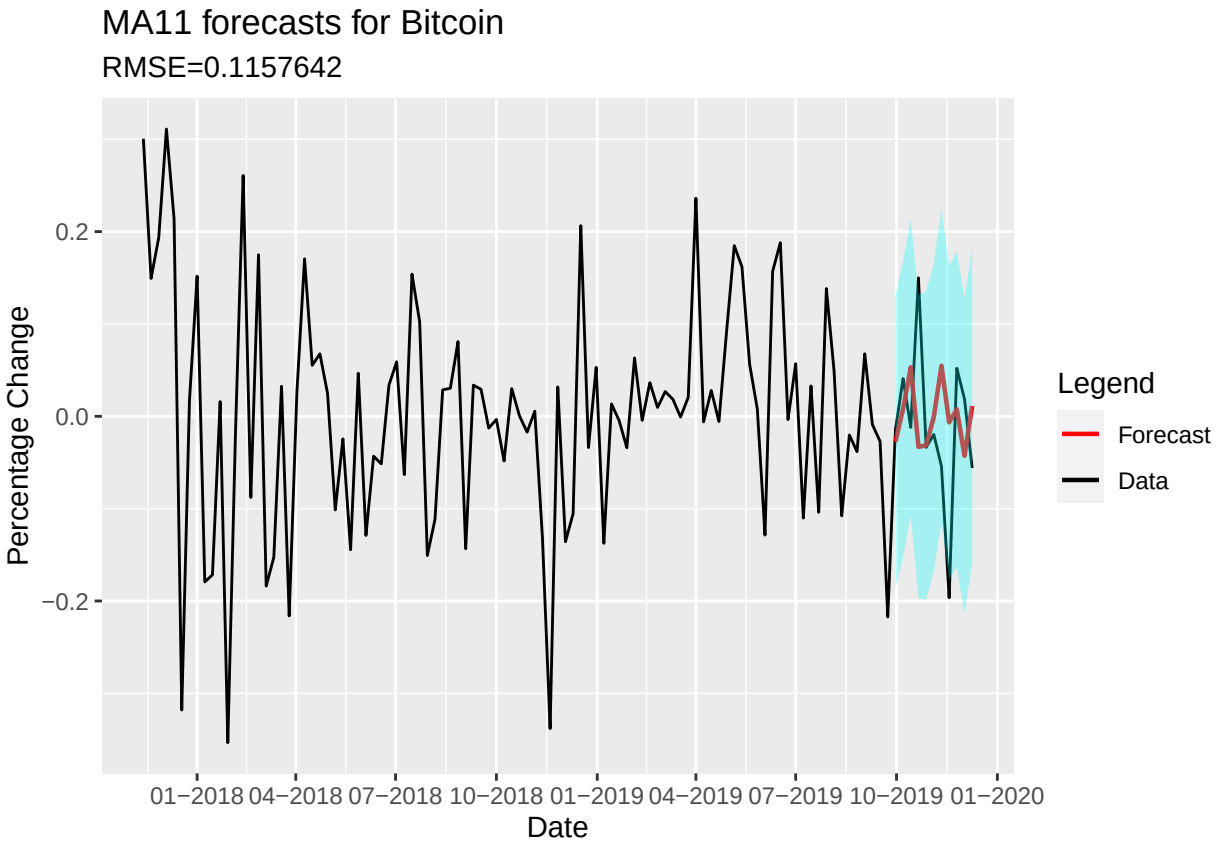
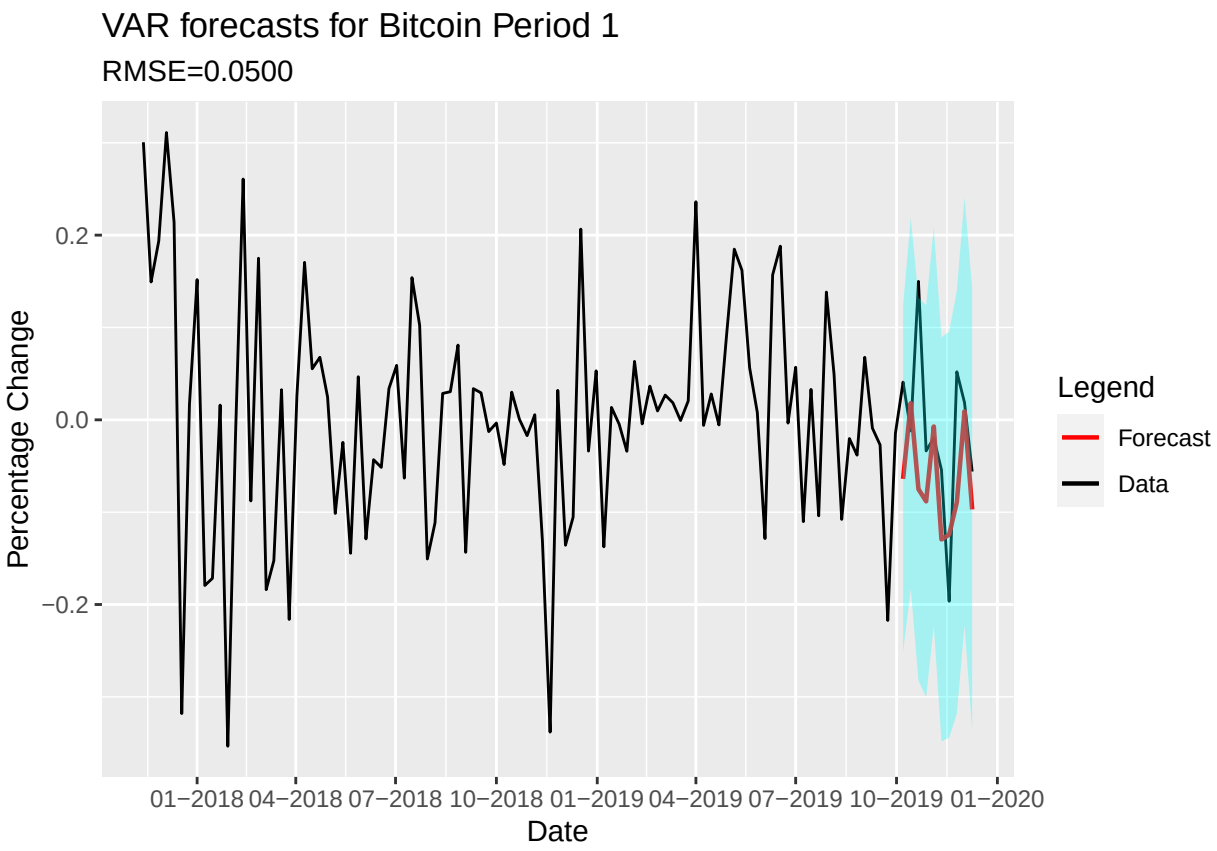
Lag Selection

For the lag of the VAR model I choose them based of the Root Mean Squared Error, I wrote a simple loop to go over a few lags between the models and based of those tables I choose the lag for the first period to be 15 and the lag for the second period to be 16, since both seemed to represent the lower RMSE between all the models for their respective periods.

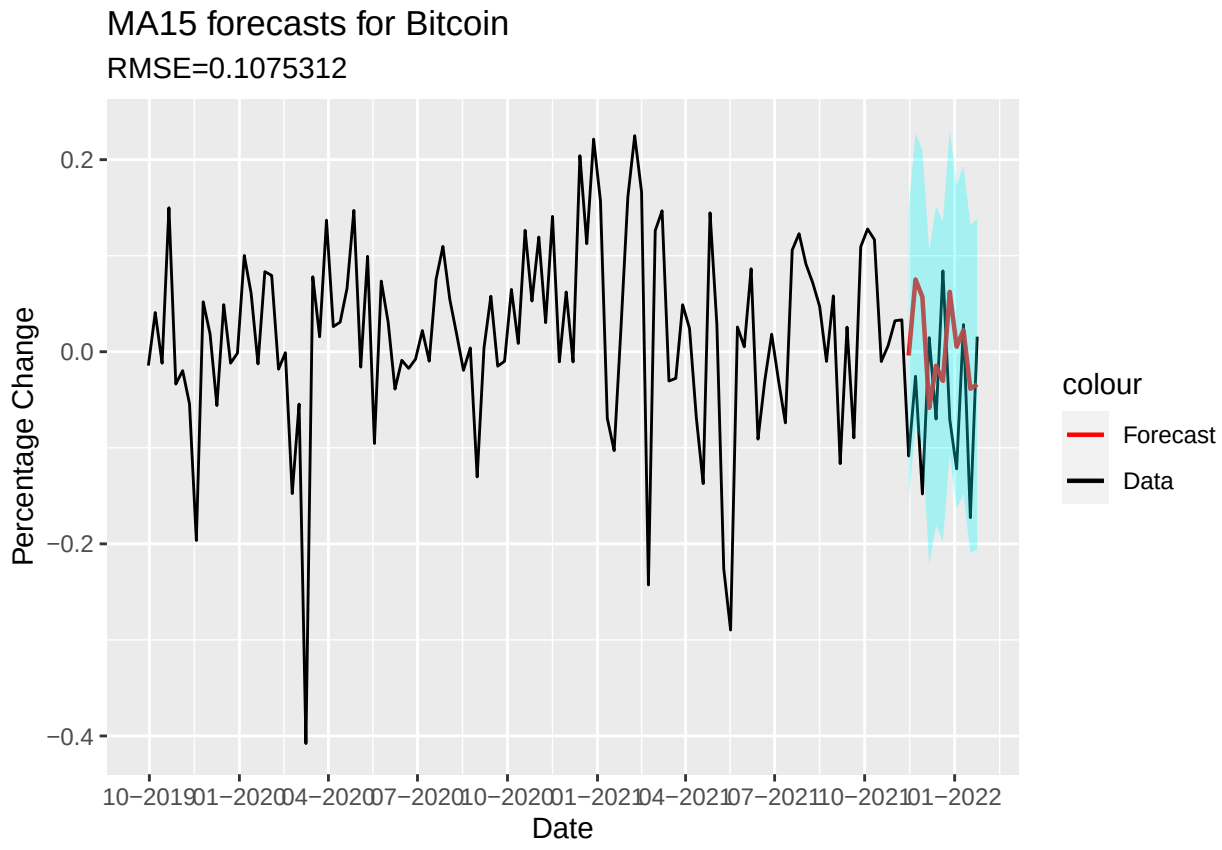
Bitcoin

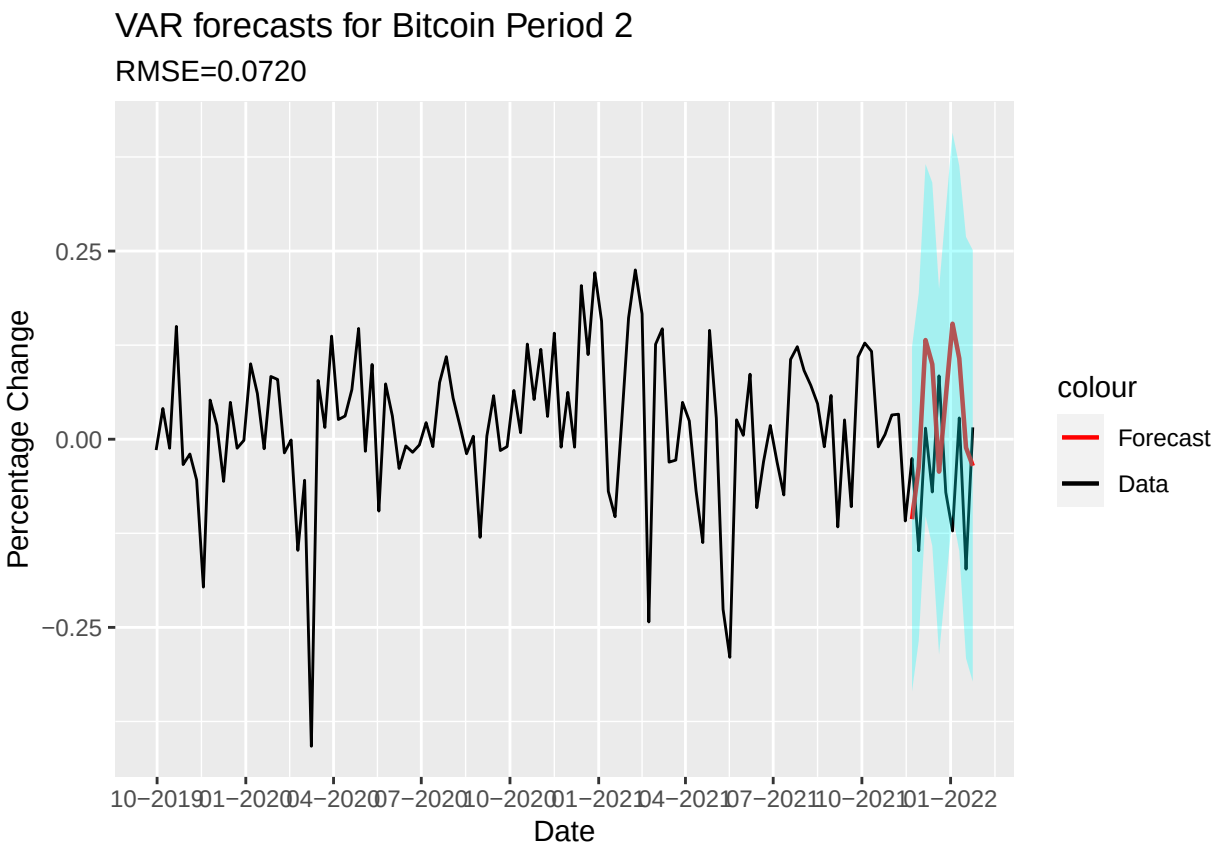
Period 1




VAR forecasts for Bitcoin Period 1
RMSE=0.0500
Percentage Change
0.2
0.0
−0.2
01−2018
04−2018
07−2018
10−2018
01−2019
04−2019
07−2019
10−2019
01−2020
Date
Legend
Forecast
Data

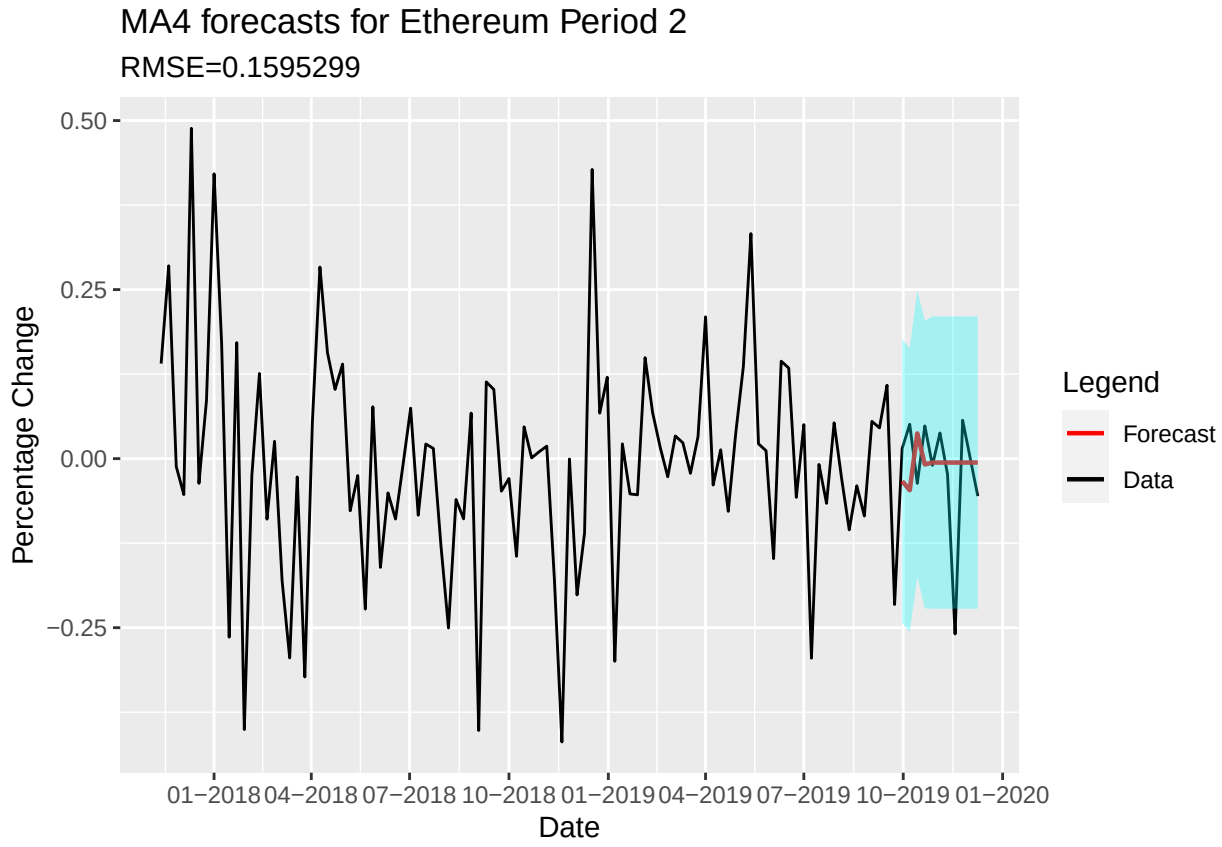
Period 2

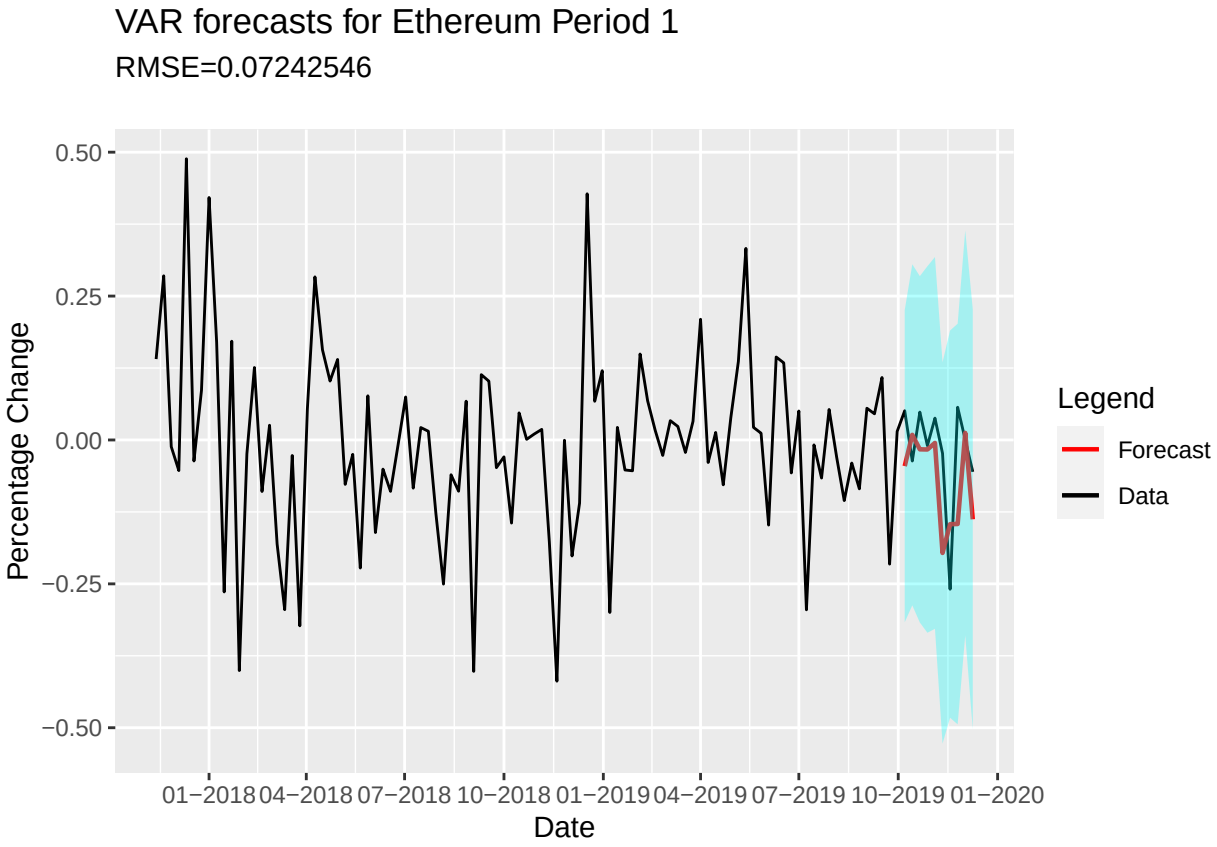

MA15 forecasts for Bitcoin
RMSE=0.1075312
Percentage Change
0.2
0.0
−0.2
−0.4
10−2019
01−2020
04−2020
07−2020
10−2020
01−2021
04−2021
07−2021
10−2021
01−2022
Date
colour
Forecast
Data


VAR forecasts for Bitcoin Period 2
RMSE=0.0720
Percentage Change
0.25
0.00
−0.25
10−2019
01−2020
04−2020
07−2020
10−2020
01−2021
04−2021
07−2021
10−2021
01−2022
Date
colour
Forecast
Data

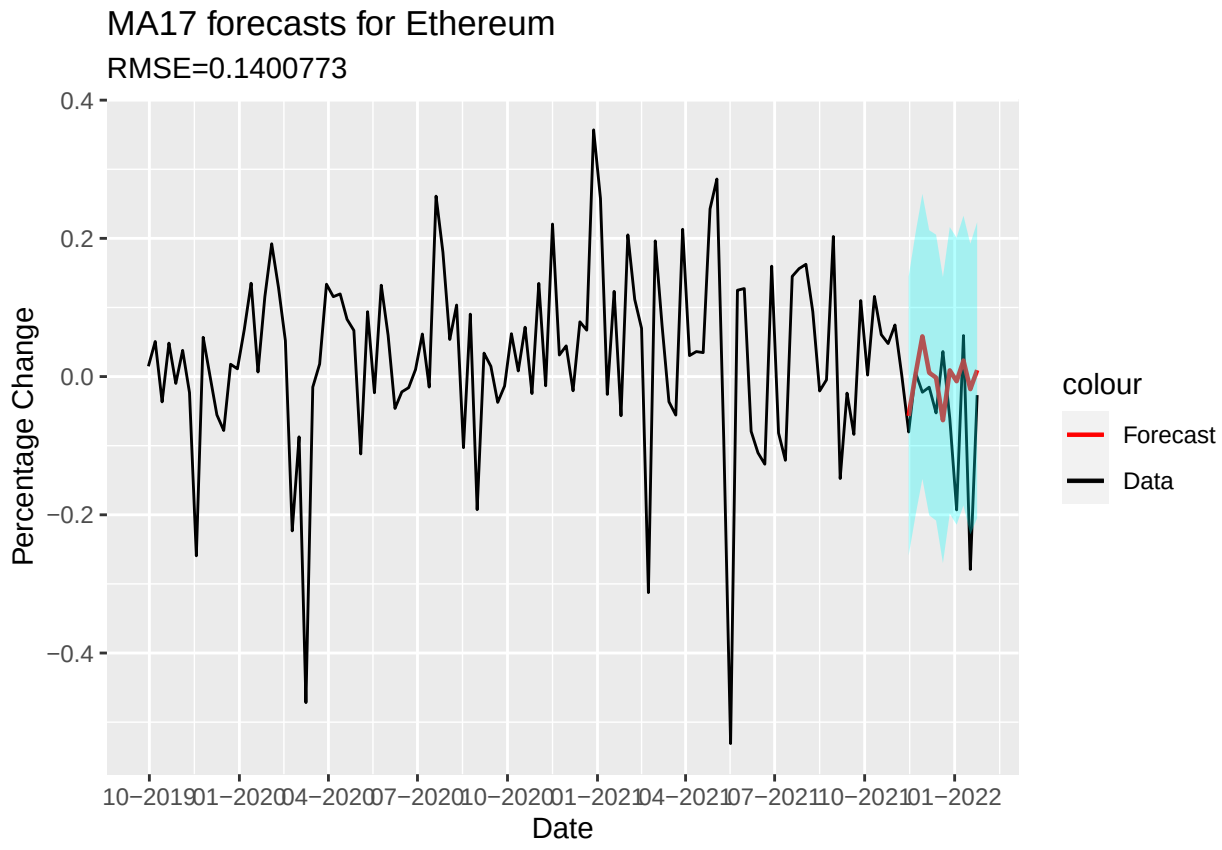
Ehtereum

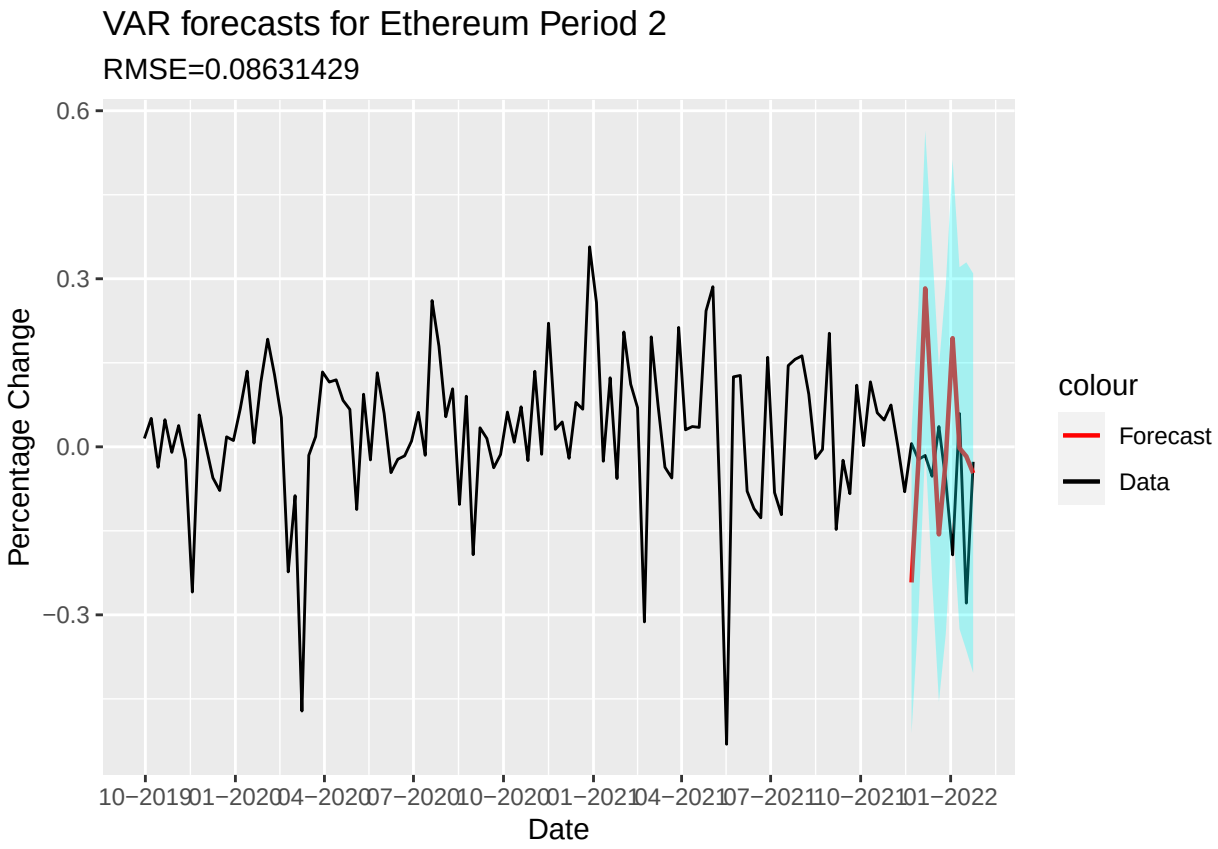
Period 1




VAR forecasts for Ethereum Period 1
RMSE=0.07242546
0.50
0.25
0.00
−0.25
−0.50
Percentage Change
01−2018
04−2018
07−2018
10−2018
01−2019
04−2019
07−2019
10−2019
01−2020
Date
Legend
Forecast
Data

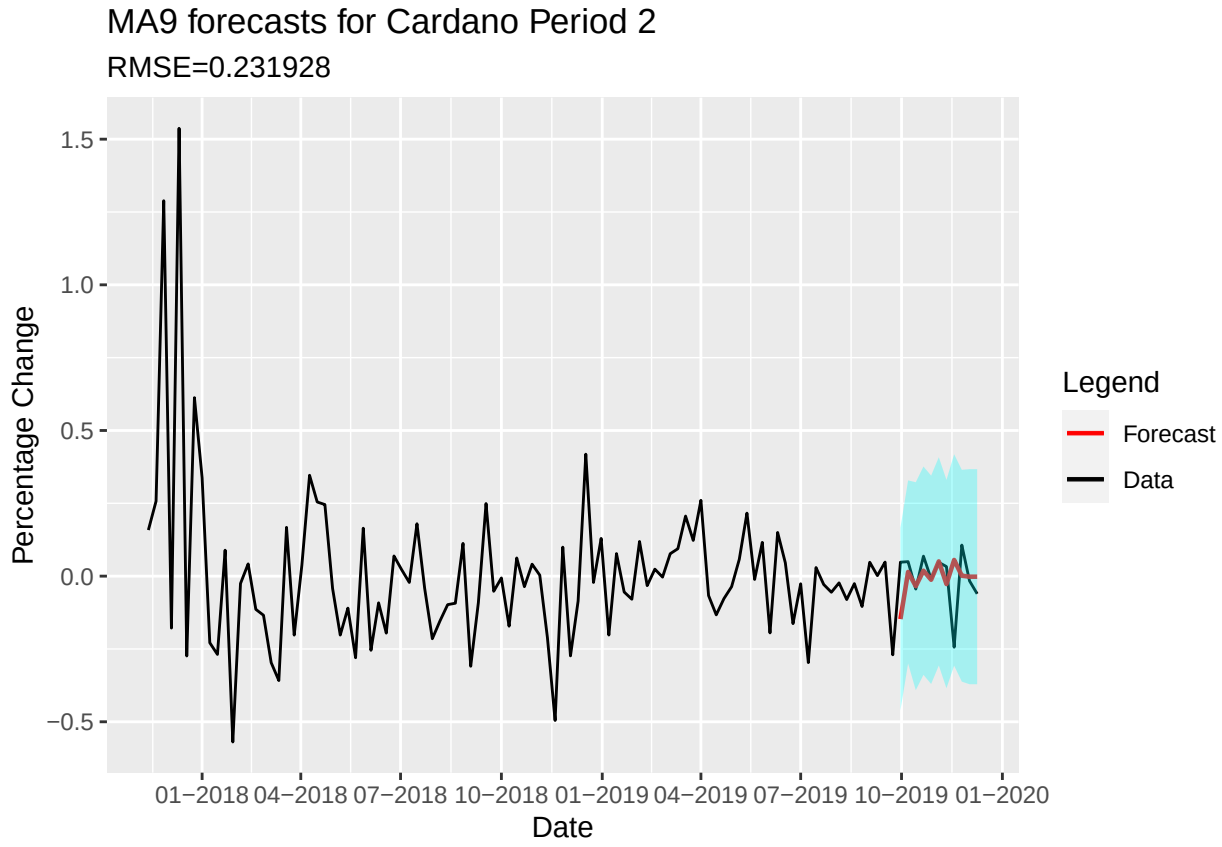
Period 2

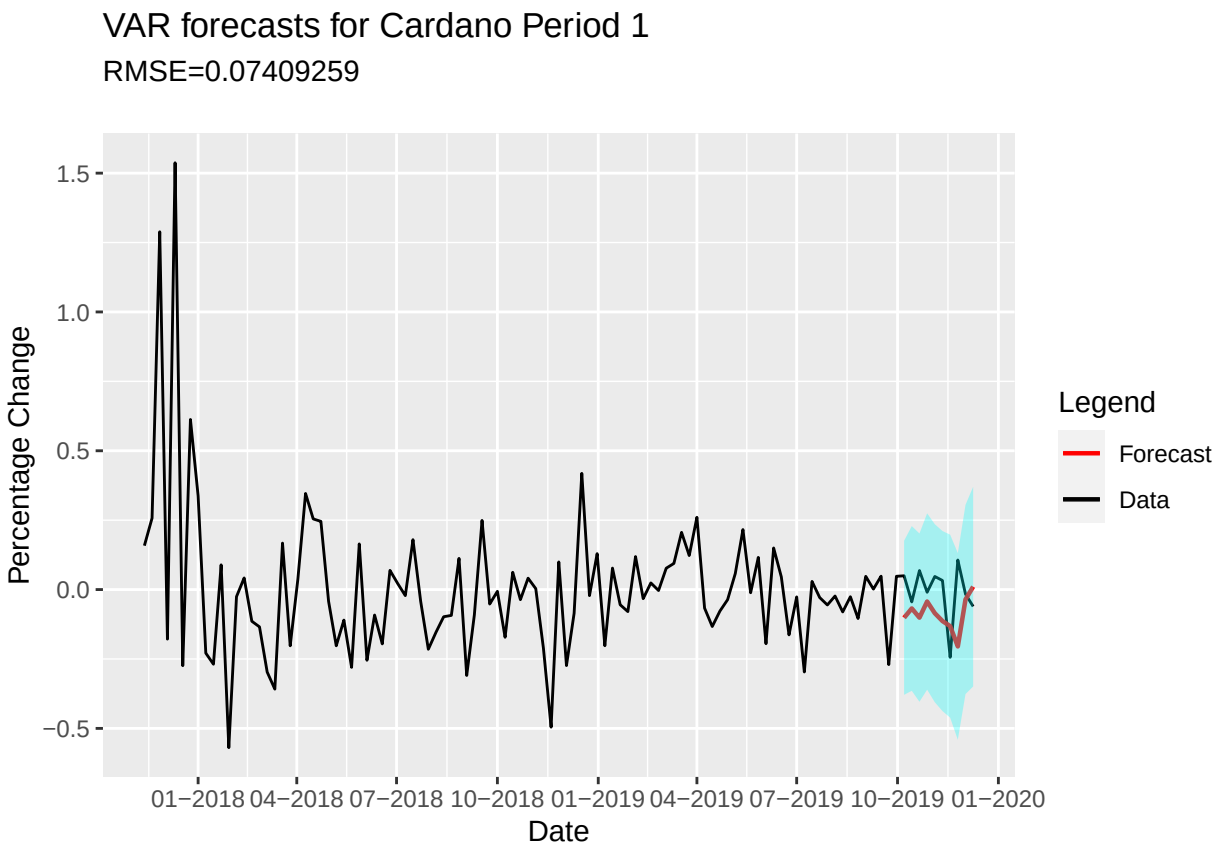

MA17 forecasts for Ethereum
RMSE=0.1400773
Percentage Change
0.4
0.2
0.0
−0.2
−0.4
10−2019
01−2020
04−2020
07−2020
10−2020
01−2021
04−2021
07−2021
10−2021
01−2022
Date
colour
Forecast
Data


VAR forecasts for Ethereum Period 2
RMSE=0.08631429
Percentage Change
0.6
0.3
0.0
−0.3
10−2019
01−2020
04−2020
07−2020
10−2020
01−2021
04−2021
07−2021
10−2021
01−2022
Date
colour
Forecast
Data

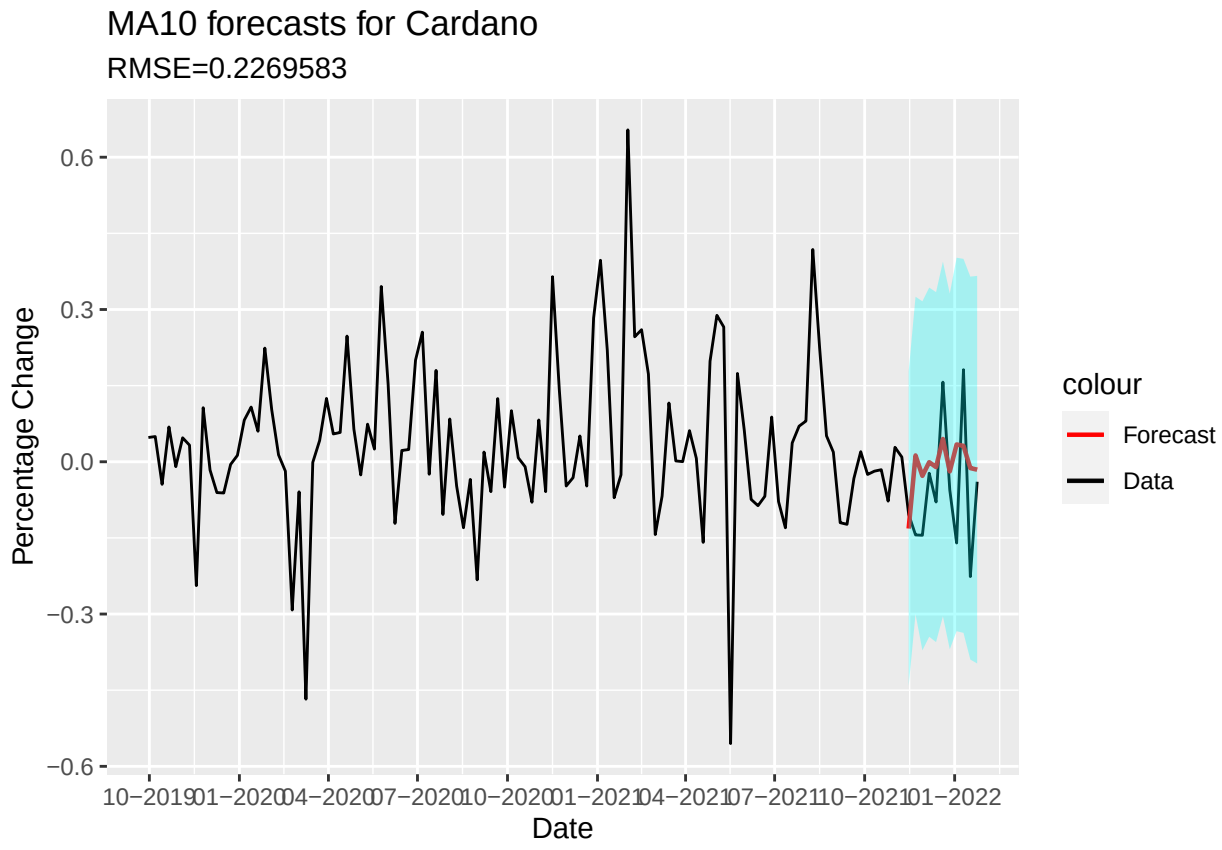
Cardano

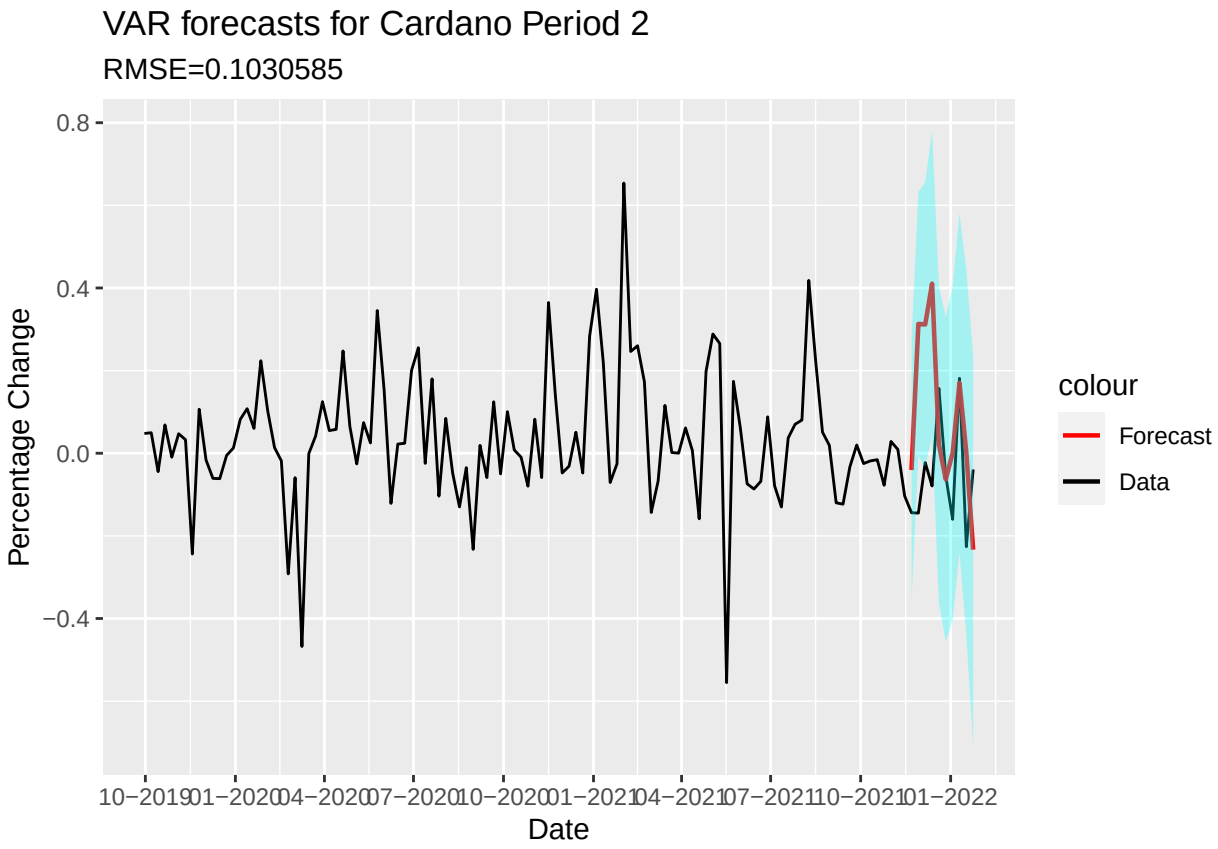
Period 1




VAR forecasts for Cardano Period 1
RMSE=0.07409259
Percentage Change
1.5
1.0
0.5
0.0
−0.5
01−2018
04−2018
07−2018
10−2018
01−2019
04−2019
07−2019
10−2019
01−2020
Date
Legend
Forecast
Data

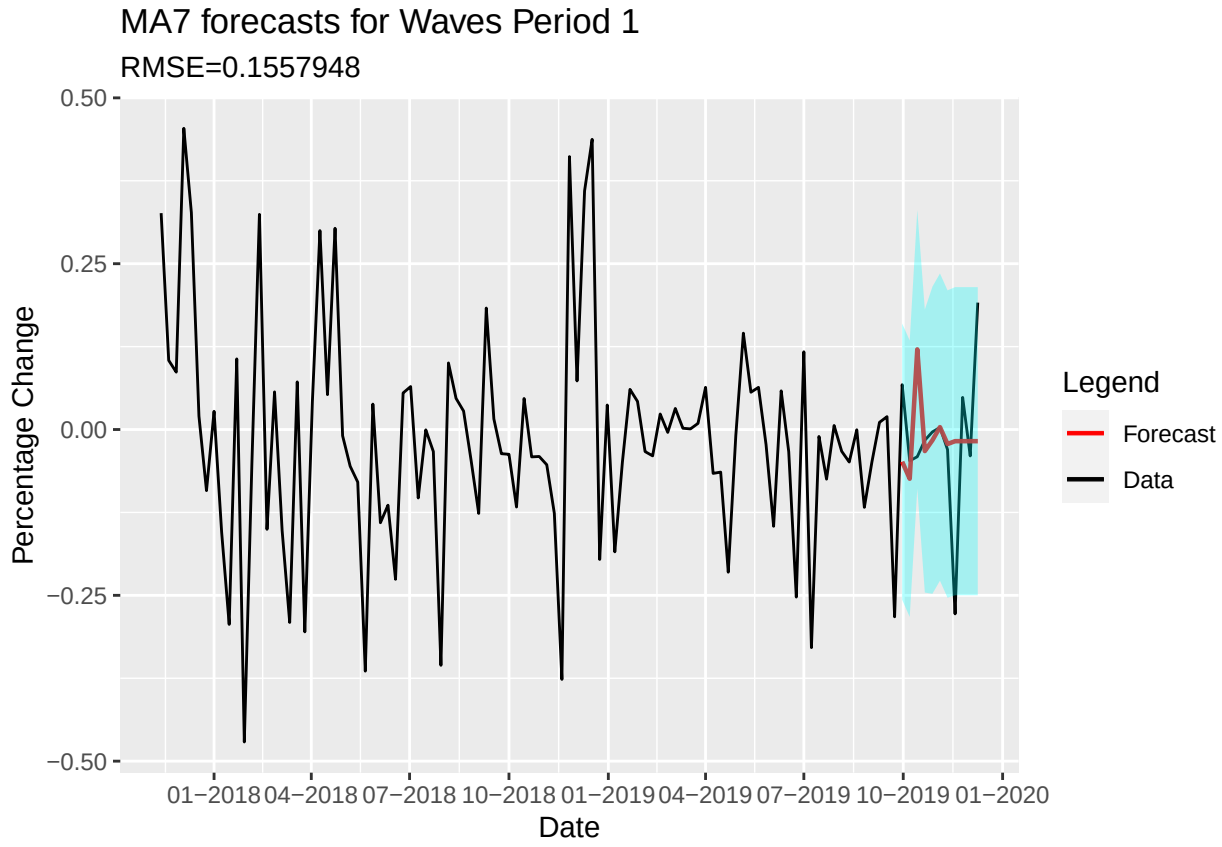
Period 2

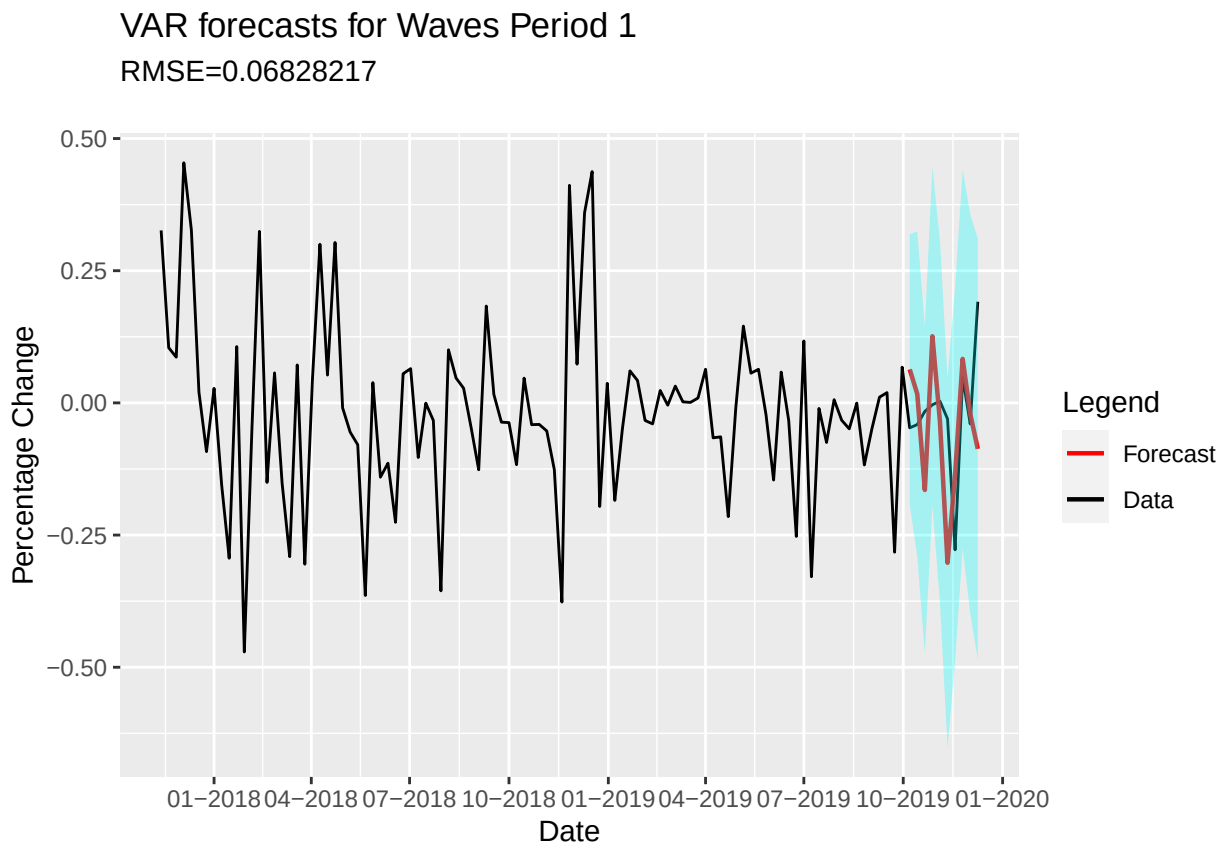

MA10 forecasts for Cardano
RMSE=0.2269583
Percentage Change
0.6
0.3
0.0
−0.3
−0.6
10−2019
01−2020
04−2020
07−2020
10−2020
01−2021
04−2021
07−2021
10−2021
01−2022
Date
colour
Forecast
Data


VAR forecasts for Cardano Period 2
RMSE=0.1030585
Percentage Change
0.8
0.4
0.0
−0.4
10−2019
01−2020
04−2020
07−2020
10−2020
01−2021
04−2021
07−2021
10−2021
01−2022
Date
colour
Forecast
Data

Waves

Period 1





Period 2

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## Warning: Duplicated aesthetics after name standardisation: alpha
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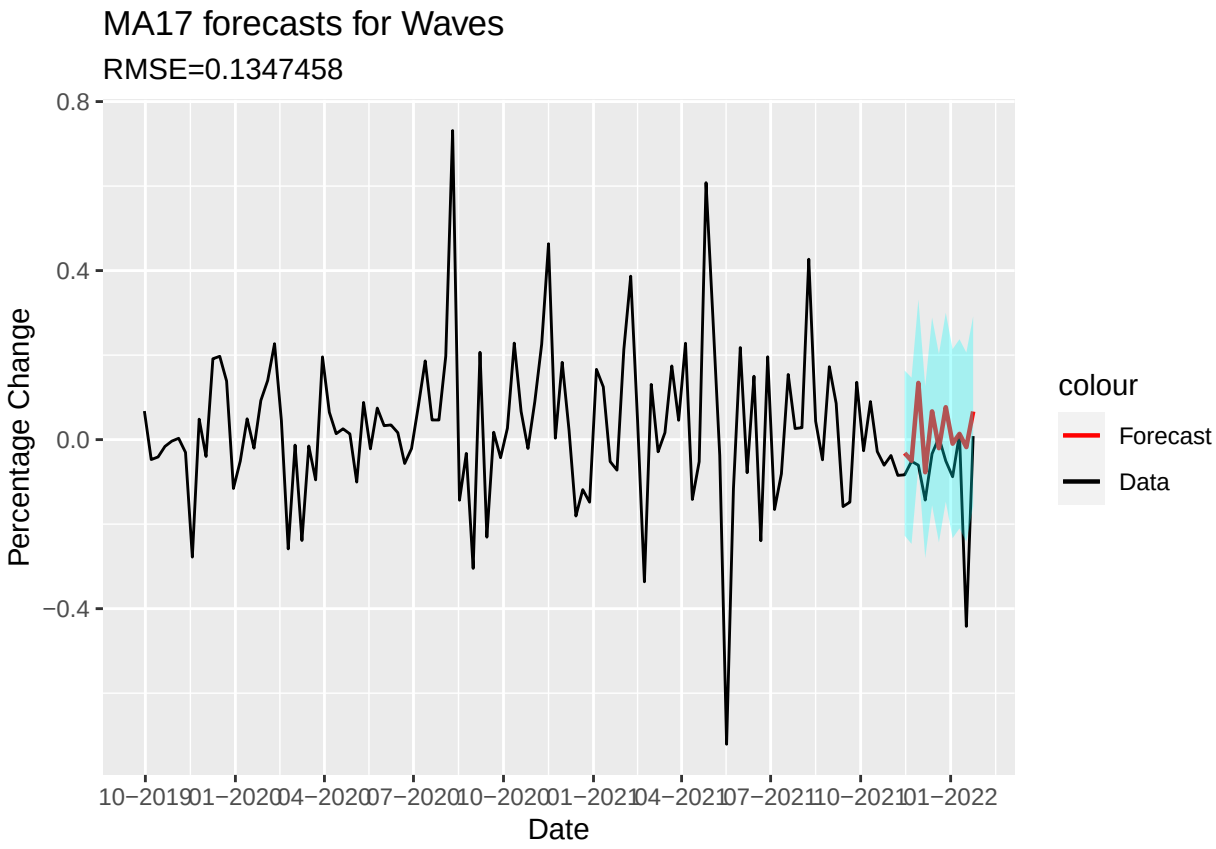
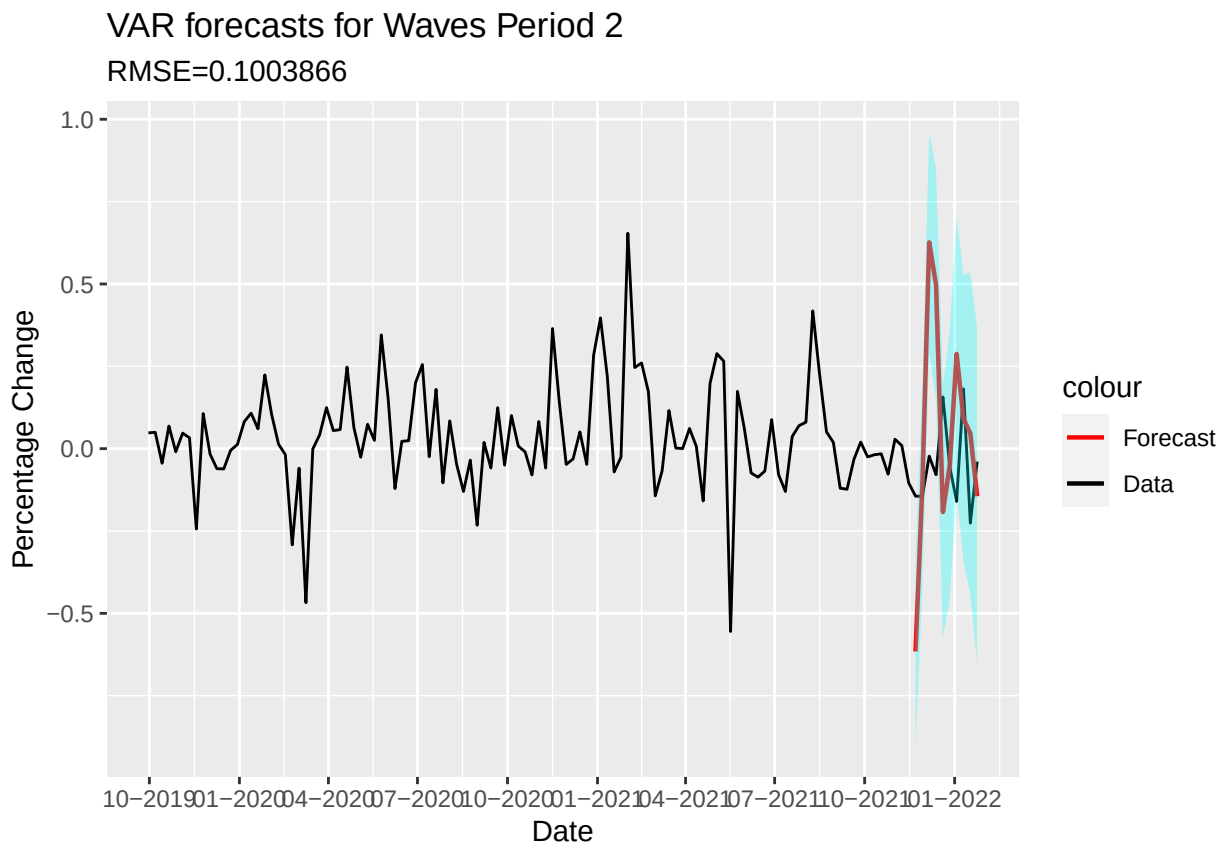

MA17 forecasts for Waves
RMSE=0.1347458
Percentage Change
0.8
0.4
0.0
−0.4
10−2019
01−2020
04−2020
07−2020
10−2020
01−2021
04−2021
07−2021
10−2021
01−2022
Date
colour
Forecast
Data



Conclusion

Variables	ARMA RMSE	VAR RMSE
BITCOIN PERIOD 1	0.1157642	0.05006434
BITCOIN PERIOD 2	0.1075312	0.06566257
ETHEREUM PERIOD 1	0.1595299	0.07242546
ETHEREUM PERIOD 2	0.1400773	0.07724711
CARDANO PERIOD 1	0.2319280	0.07409259
CARDANO PERIOD 2	0.2269583	0.09029023
WAVES PERIOD 1	0.1557948	0.06828217
WAVES PERIOD 2	0.1347458	0.08246645