

BITCOIN AND ETHEREUM PRICE FORECASTING

Volha Puzikava
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Disclaimer

The described analyses fulfill educational purposes only. The hypothetical business case and the results of forecasting should not be considered as financial advice, and have not been approved by any professional or financial organization.



Overview

- Cryptocurrencies - widely popular investments
- Crypto lets buy goods, services, use apps, games, trade for profit, etc.
- In 2021 ~ 59.1million Americans owned crypto
- Bitcoin and Ethereum are on the top
- Move in tandem
- Bitcoin has the highest market cap (world champion)
- Ethereum will overtake Bitcoin???



Overview Cont'd

This Project:

1. Forecasts price trends for half year out
2. Determines which crypto is worth investing into



Outline

1. Business Problem
2. Data
3. Data Preparation and Exploration
4. Modeling
5. Evaluation
6. Recommendations
7. Conclusion
8. Next Steps



Business Problem

The **Wall Street Company** wants to *invest* money in **crypto** and *lose* as **less** as possible

Goal:

- Predict crypto behavior half year out



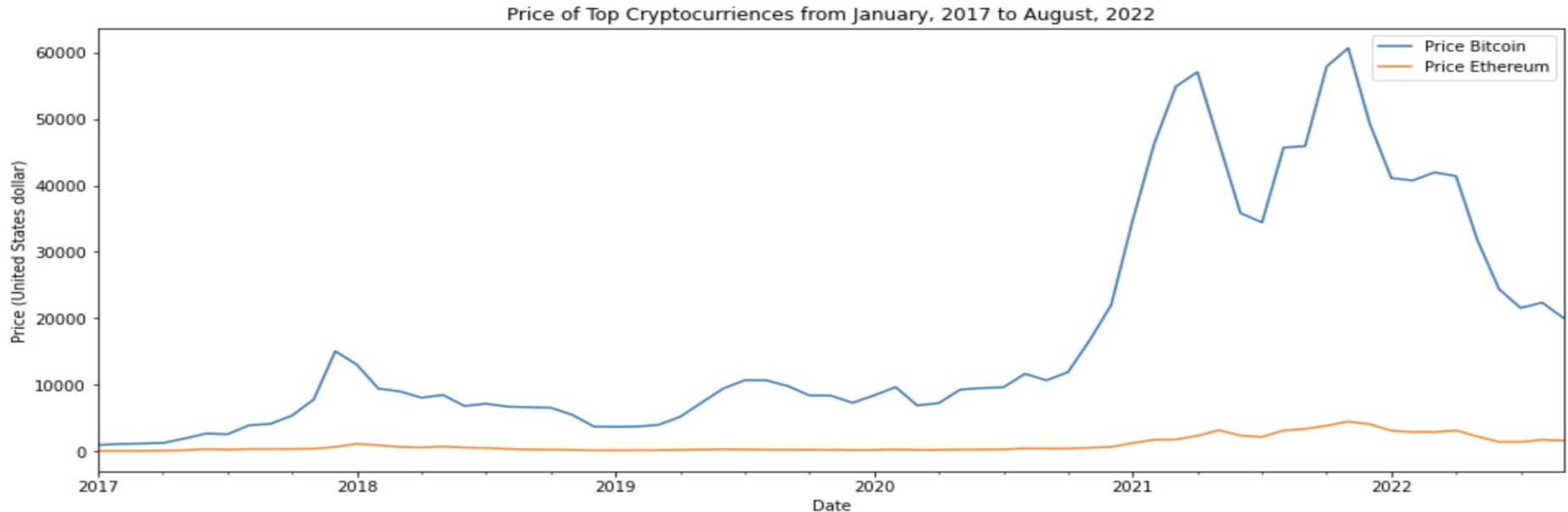
Data

- taken from [investing.com](https://www.investing.com) website
- contained daily historical data starting January 1, 2017
- analyzed till August 31, 2022
- 2,070 days for analysis



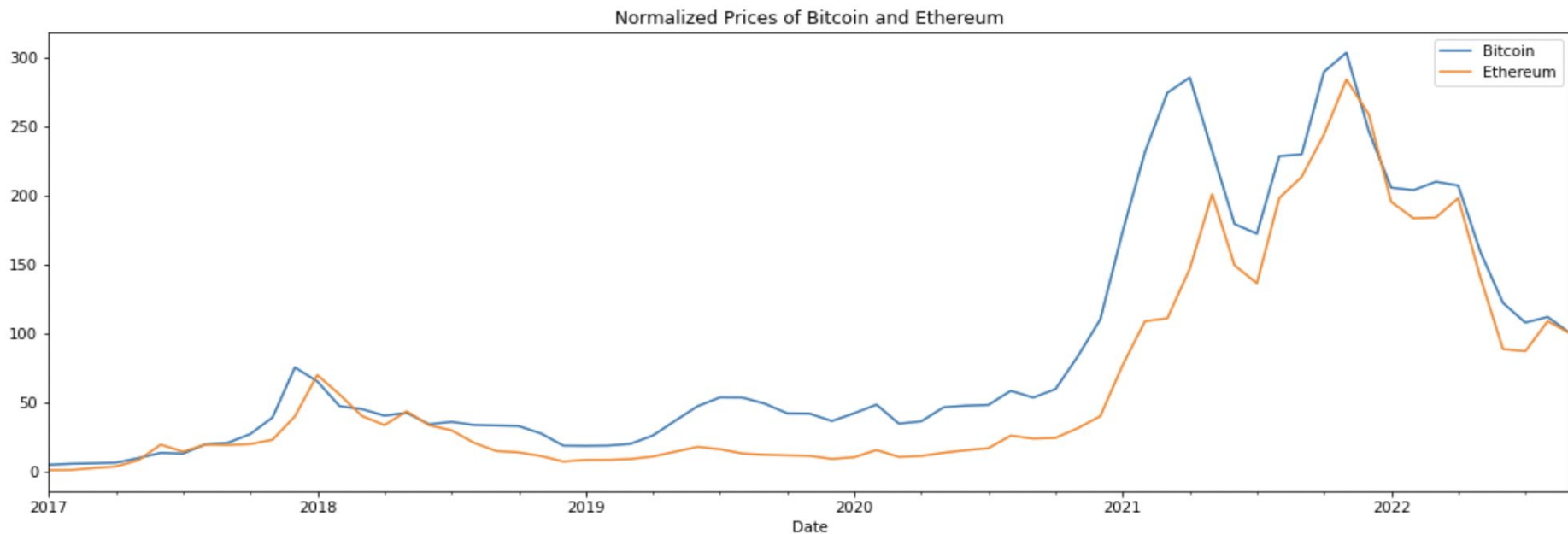
Data Preparation and Exploration

- The dates were sorted in an ascending order
- The data was downsampled from daily mean to monthly mean
- The data belonged to different price ranges - had to be brought to one scale



Modeling

- The data was normalized to one scale



Modeling Cont'd

- The train-test split: the portion of data was cut off at the end (test set)
- Recurring patterns over a fixed period of time and upward and downward movements were removed (stationary data)
- Various time series models were built



Modeling Cont'd

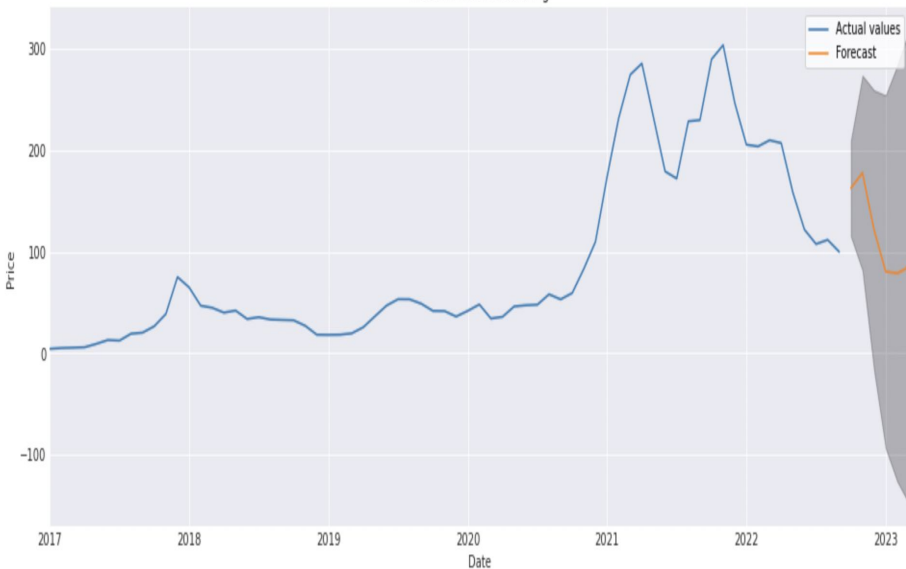
- The best model: fit the data better (lower AIC) and made smaller error while predicting the data (lower RMSE)
- The best models were tried on the test set
- Improved models: not statistically significant features removed (high p-values), more data clustered in the middle of the range (normal distribution)



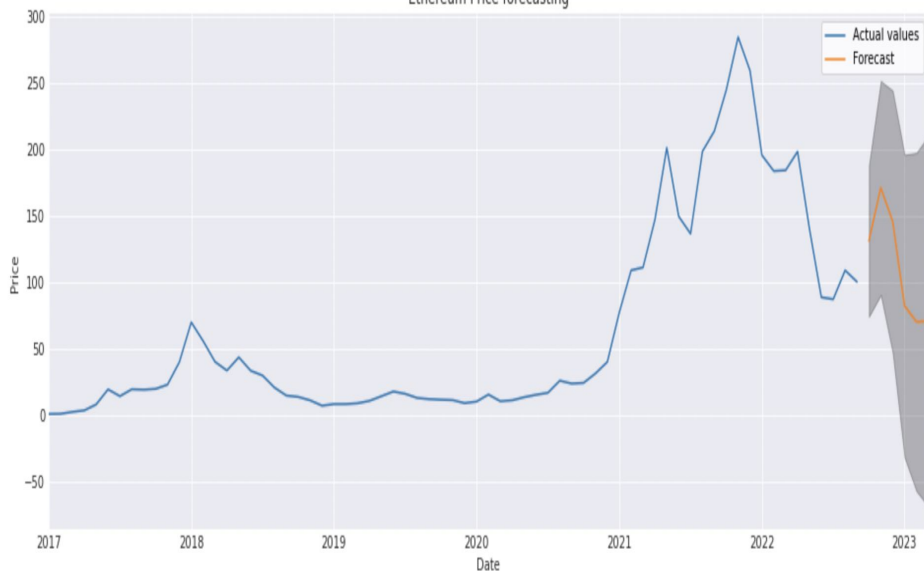
Modeling Cont'd

- Predictions were made into the future

Bitcoin Price forecasting



Ethereum Price forecasting



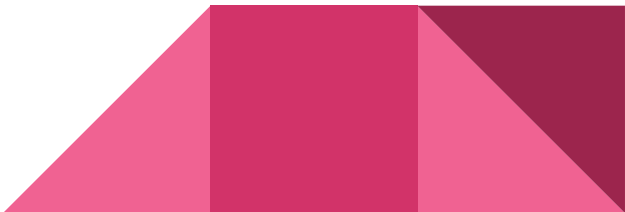
Evaluation

Best models:

Bitcoin

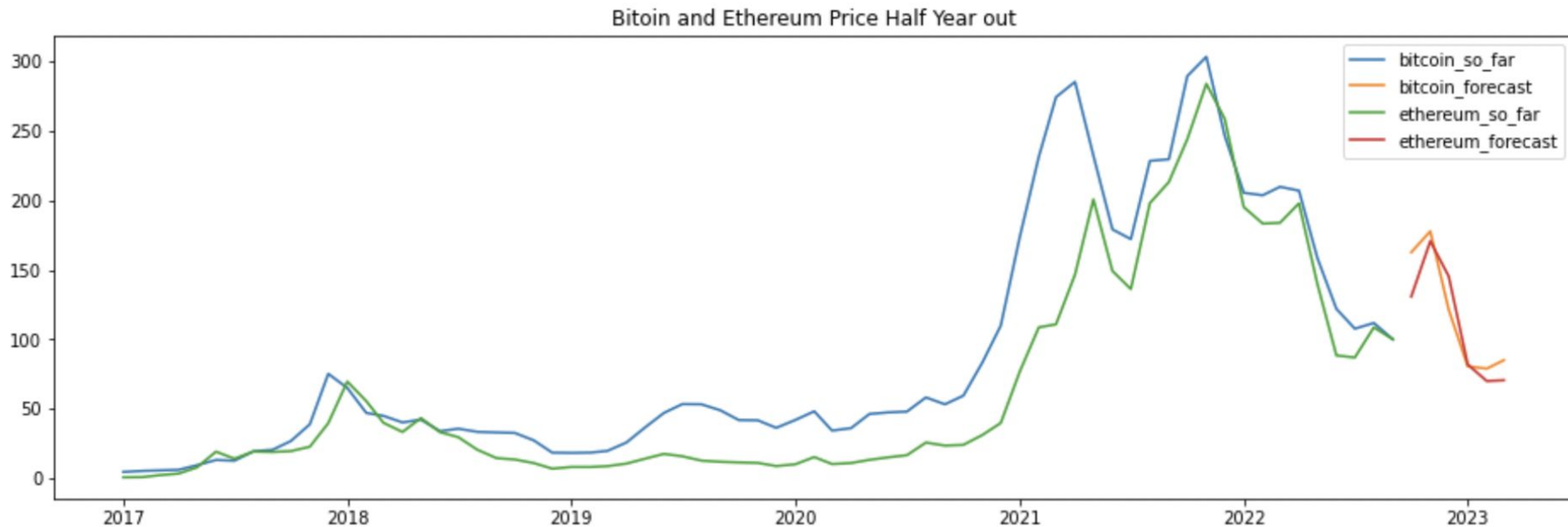
- $\text{ARIMA}(1, 1, 1) \times (0, 1, 0, 12)$
- $\text{AIC} = 349.75$
- $\text{RMSE} = 156.1$

Ethereum

- $\text{ARIMA}(0, 1, 0) \times (0, 1, 0, 12)$
 - $\text{AIC} = 328.48$
 - $\text{RMSE} = 170.0$
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Recommendations

- *Not the best time to invest!*
- *To lose less: invest in Ethereum, sell the assets by beginning - mid October*
- *Profit won't be big*

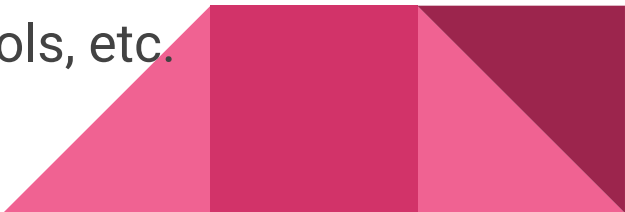


Conclusion

- Both cryptos are risky
- Ethereum seems the one that may bring income
- Models are not perfect
- More digging is necessary



Next Steps

1. Lower AIC and RMSE in the models
 2. Other time series models
 3. Less but more recent data
 4. Exogenous factors:
 - economic situation on the US market,
 - political situation in the world,
 - changes to the rules in cryptocurrencies protocols, etc.
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Thank you!

Email: helga.mikel@gmail.com

GitHub: [@VolhaP87](https://github.com/VolhaP87)

LinkedIn: <https://www.linkedin.com/in/volha-puzikava-2319294a/>

