Deep Learning Powered HAR Models

Forecasting the Realized Volatility of Bitcoin

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This project was created using Google Colab.
The notebook can be found at Google Colab.
https://colab.research.google.com/drive/1sJzRECcHC5H5JRsX7B5iEZdrGE-onn3X?usp=sharing
The computations done in Colab was done on a GPU, with a Colab Pro License.

Contents

Chapter 1

Introduction

1.1 Volatility Forecasting in Finance

The volatility of financial assets is one of the most important concepts in finance. Understanding volatility is paramount in the realms of asset pricing, risk management and portfolio optimization (Elton, 2014, p. 44-47). Thus, the modeling and forecasting of the volatility of financial assets, is a widely researched topic in the financial and econometric literature.

1.2 Cryptocurrency Trading

1.3 Previous Works

1.4 Contributions and Limitations

Chapter 2

Research Question

How can neural networks enhance the forecasting capability of HAR-style models in realized volatility

Chapter 3

Theory

The research statement specifies that this thesis revolves around the prediction of the volatility of Bitcoin returns. This section aims to lay the foundation for the subjects from a financial perspective. Hence, an introduction to the nature of financial markets, volatility and its stylistic facts will be presented. Furthermore, as we are working with high-frequency intraday data, the subject of market microstructure is necessary to understand. Lastly, a general overview of cryptocurrencies as financial assets is given.

3.1 Efficient Markets

3.2 Volatility

3.3 Market Microstructure

3.4 Cryptocurrencies as a Financial Asset

Chapter 4

Econometric Models

4.1 Linear Time Series Models

4.2 HAR Models

4.2.1 Variants of the HAR Model

4.3 Assumptions

Chapter 5

Deep Learning

5.1 Machine Learning

5.1.1 Origins of Deep Learning

5.2 Multilayer Perceptron

5.2.1 Neural Network Architecture

5.2.2 Activation Functions

5.2.3 Stochastic Gradient Descent

5.3 Deep Learning in Time Series Forecasting

5.4 Recurrent Neural Networks

5.4.1 Long Short-Term Memory

5.4.2

5.5 Convolutional Neural Networks for Time Series Forecasting

5.5.1 Dilated Causal Convolutional Neural Networks

5.6 HAR-Inspired Neural Networks

5.6.1 Training Data

5.6.2 Network Architecture

Network Architecture

Criterion and Optimizer

Training Setup

Chapter 6

Results

6.1 Stationarity

6.2 In-Sample Evaluation

6.2.1 HAR Models

6.2.2 Neural Networks

6.2.3 HAR Inspired Neural Networks

6.3 Forecasting Performance

6.3.1 HAR Models

6.3.2 Neural Networks

6.3.3 HAR Inspired Neural Networks

Chapter 7

Discussion

7.1 Machine Learning in Finance

7.2 Inference or Accuracy

Chapter 8

Conclusion

References

Elton, E. J. (2014). *Modern portfolio theory and investment analysis* (Ninth edition ed.). Hoboken, NJ: Wiley.