

INTERCONNECTIVITY BETWEEN DIGITAL AND TRADITIONAL ASSET PRICES

1. INTRODUCTION

This project aims to explore the interconnectivity between digital and traditional asset prices using various data analysis and machine learning techniques. Specifically, the project focuses on studying the correlation between the S&P 500, gold, Bitcoin, and Ethereum over the past five years. The core question addressed is whether the price fluctuations of Bitcoin and Ethereum have been significantly correlated with those of gold and major stock indices. The analysis begins with an exploration of the data, examining returns, correlations, and performing linear regression. Following this, both LSTM (Long Short-Term Memory) models and ARIMA (AutoRegressive Integrated Moving Average) models are employed to provide deeper insights for Bitcoin and Ethereum price predictions. The analysis is conducted using Python in a Jupyter Notebook environment.

2. REQUIREMENTS

To run this project, you need Python 3.9.12 and the following packages installed in their latest accessible versions:

- Pandas - version 1.4.2
- Matplotlib - version 3.5.1
- Seaborn - version 0.11.2
- Numpy - version 1.21.5
- Warnings (built-in module)
- TensorFlow - version 2.8.0
- Scipy - version 1.8.0
- Scikit-learn - version 1.0.2
- Statsmodels - version 0.13.2

To run the project, clone the GitHub repository to your local machine and navigate to the project directory. Ensure you have the CSV file of the database named **DataCapstone.csv** in the same directory as the Jupyter Notebook. The CSV file should use a semicolon (;) as the delimiter and commas (,) for decimal separation. Open the Jupyter Notebook and run the cells to execute the analysis.

If you have any questions for running the code, please ask me at maxime.poussard@unil.ch.