

**ANALYSIS OF BITCOIN AND ETHEREUM VOLATILITY ON THE
S&P 500 INDEX, CRUDE OIL PRICES, AND GOLD PRICES
USING THE M-GARCH MODEL**

THESIS

Submitted as Partial Requirement to Achieve Bachelor Degree in
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Submitted by:

Aulia Azmira

2110523002

INTERNATIONAL MANAGEMENT STUDY PROGRAM

DEPARTMENT OF MANAGEMENT

FACULTY OF ECONOMICS AND BUSINESS

UNIVERSITAS ANDALAS



Alumni Number at
University

Aulia Azmira

Alumni Number at
Faculty

a) Place/Date of Birth : Padang/July 11th, 2003, b) Parents Name : Ulul Azmi and Mira Emirina, c) Faculty : Economics and Business, d) Department : International Management, e) ID Number : 2110523002, f) Graduation Date : August 21st, 2025, g) Grade : With Honors, h) GPA : 3.83, i) Length of Study : 4 years, j) Parents' Address : Jl. Aru Komplek Pemda No 19A, Lubuk Begalung, Padang.

Analysis of Bitcoin and Ethereum Volatility on the S&P 500 Index, Crude Oil Prices, and Gold Prices Using the M-GARCH Model

Thesis by : Aulia Azmira



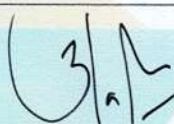
Thesis Supervisor : Fajri Adrianto, S.E., M.Bus (Adv), Ph.D.

ABSTRACT

This study analyzes the volatility relationship between Bitcoin, Ethereum, and traditional financial assets, namely the S&P 500 Index, crude oil prices, and gold prices, using the Multivariate GARCH (M-GARCH) model. The data consist of weekly returns from January 2020 to December 2024, collected from secondary sources such as www.investing.com and www.coinmarketcap.com. The analysis was conducted using EViews 13 to estimate the dynamic interactions and volatility spillovers across the selected assets. The results show that Bitcoin has significant volatility connections with the S&P 500 and gold, but not with crude oil. In contrast, Ethereum shows weaker and mostly insignificant relationships with these traditional assets, meaning its volatility is more influenced by crypto-specific factors than by global market movements.

Keywords: Bitcoin, Ethereum, Volatility, S&P 500 Index, Crude Oil, Gold, M-GARCH Model

This thesis is already examined and passed on June 18th, 2025. This abstract is already approved by supervisor and examiners.

Signature	1. 	2. 	3. 
Name	Fajri Adrianto, S.E., M.Bus (Adv), Ph.D.	Prof. Dr. Tafdil Husni, S.E., MBA	Laela Susdiani, S.E, M. Com (App.Fin)

Acknowledged,
Head of Management Department

Prof. Dr. Donard Games, SE., M.Bus (Adv)
NIP. 198011122005011003



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