MLOps

Release 1

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Jun 02, 2025

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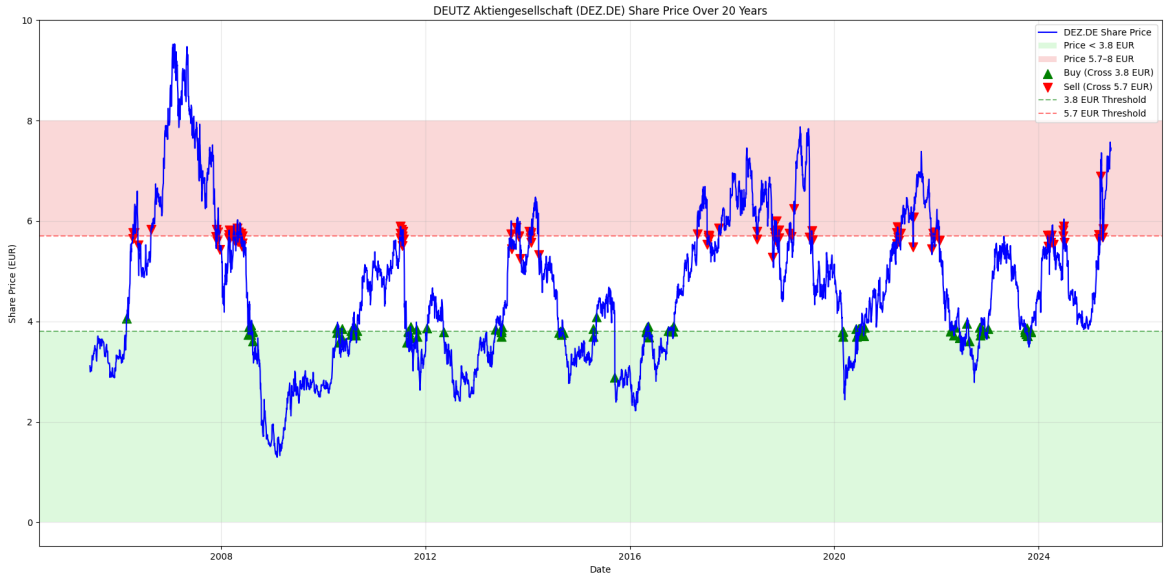
CHAPTER

ONE

THE CASE OF DEUTZ

In this manual the stock value of Deutz is used, mainly because it fluctuates and has some periodicity.



CHAPTER

TWO

DEUTZ AG

2.1 Overview

Deutz AG is a German manufacturer of internal combustion engines. The company was founded in 1864 by Nicolaus Otto, who invented the four-stroke engine. Deutz AG is headquartered in Cologne, Germany, and is known for its innovation and engineering excellence in the production of diesel and gas engines.

The company operates in various sectors, including agriculture, construction, material handling, and stationary equipment. Deutz engines are recognized for their reliability, efficiency, and compliance with stringent emission standards.

2.2 Share Information

Deutz AG is publicly traded on the Frankfurt Stock Exchange under the ticker symbol *DEZ*. The company's shares are included in the SDAX index, which lists small capitalization companies in Germany.

Key highlights about Deutz AG shares: - **Ticker Symbol**: DEZ - **Exchange**: Frankfurt Stock Exchange - **Index**: SDAX

Investors consider Deutz AG a stable investment due to its long history, strong market position, and continuous innovation in the engine manufacturing industry.

2.3 Useful Links

- Deutz AG Official Website
- Deutz AG Investor Relations

CHAPTER

THREE

INVESTMENT MASTERS

At Investment Masters, a fictional company specializing in stock market analysis, our mission is to uncover hidden patterns in stock data to inform investment strategies.

In this project, we focus on the German company Deutz (DEZ.DE) as a case study for pattern recognition.

While human analysts can visually identify recurring price cycles in Deutz's stock data, these patterns are challenging to define mathematically or programmatically without advanced techniques. To address this, we leverage Machine Learning (ML) to detect complex patterns. We have compiled a database of quarterly data for approximately 200 German stocks, providing a robust foundation for analysis. Additionally, we developed a synthetic data generator that mimics real stock market behavior, producing quarterly stock data with a specific pattern: a stock price increasing by over 80% four times over 17 years, resulting in cycles of approximately four years. This synthetic data, designed to resemble real-world volatility and randomness, serves as the training set for our neural network model. The ultimate goal is to train an ML model capable of recognizing the Deutz stock's pattern when fed its real historical data. By deploying this model using Azure Machine Learning, FastAPI, Docker, and Kubernetes, we aim to create an automated, scalable solution for pattern detection. This project, part of the Masterclass Deploying AI Solutions, demonstrates our ability to operationalize ML workflows (MLOps) efficiently. We will document the process, including data preparation, model training, API integration, and deployment, in a comprehensive report, showcasing how this solution integrates into Investment Masters' investment analysis platform.

CHAPTER

FOUR

INDICES AND TABLES

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