Morningstar European Funds

Team -8 Data mining project

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We’ve chosen “Morningstar European Funds” as our dataset for the project. The primary objective of this project is to conduct an extensive comparative analysis of Mutual Funds and ETFs in Europe and America. Morningstar specializes in compilation and analysis of funds, stocks and general market data. Morningstar ratings are generally considered to be high quality in the financial industry. The dataset is comprised of 57,603 Mutual Funds and 9,495 ETFs, which involves working with 132 independent variables. The project aims to Analyze the returns, volatility, and financial ratios (including price/earning, Treynor and Sharpe ratios, alpha, and beta) to assess the performance and risk associated with Mutual Funds and ETFs. The final goal is to build predictive models to forecast future fund performance based on historical data and identified trends.

Modeling methods :

Linear Regression: Used to predict a quantitative response. It can be applied if there is a linear relationship between the predictors and the fund performance.

Random Forest: An ensemble learning method that can be used for regression tasks to predict fund performance.

Gradient Boosting: Builds an additive model in a forward stage-wise fashion; it allows for the optimization of arbitrary differentiable loss functions.

Long Short-Term Memory Networks (LSTM) (Deep learning), ARIMA (AutoRegressive Integrated Moving Average) (Time Series), GARCH (Generalized Autoregressive Conditional Heteroskedasticity)

Econometric Models: Vector Autoregression (VAR)

SMART Questions

**\*General Analysis:\***

Overview of the Dataset: What is the distribution of Mutual Funds and ETFs in the dataset, and how do they vary by management company and size?

Asset Distribution: How do the total net assets compare between Mutual Funds and ETFs?

Management Company Analysis: Which management companies have the largest number of funds? Which have the highest total net assets?

**\*Portfolio Indicators:\***

Asset Allocation: How does asset allocation (cash, stocks, bonds) differ between Mutual Funds and ETFs?

Sector Allocation: What are the most common sectors invested in, and how does this vary between Mutual Funds and ETFs?

Diversification: Are there any noticeable trends in diversification between different types of funds?

**\*Returns and Financial Ratios:\***

Performance Analysis: How have Mutual Funds and ETFs performed over the past year? Which have the highest year-to-date returns?

Risk-Adjusted Returns: Utilize the Sharpe and Treynor ratios to evaluate which funds provide the best risk-adjusted returns.

Comparing Ratios: How do the price/earning, alpha, and beta ratios compare between Mutual Funds and ETFs?

Volatility Analysis: Which funds have shown the most/least volatility over the specified time period?

**\*Sustainability:\***

Sustainability Focus: Which funds are rated highest in terms of sustainability?

Correlation with Performance: Is there any correlation between a fund’s focus on sustainability and its financial performance?

**\*Trends and Patterns:\***

Time Series Analysis: Are there any noticeable trends or patterns in the returns or financial ratios of Mutual Funds or ETFs over time?

Comparative Analysis: How do European Mutual Funds and ETFs compare to their American counterparts in terms of returns, asset allocation, and financial ratios?

Effect of Management Company on Returns: Does the management company have a significant effect on the returns or financial ratios of the funds?

**\*Correlations and Predictive Analysis:\***

Correlation Analysis: Are there any significant correlations between different financial ratios, returns, and portfolio indicators?

Predictive Modeling: Can we build a predictive model to estimate future returns or risk levels based on the available data?

**\*Niche and Specific Questions:\***

Outliers and Extremes: Are there any funds that stand out as outliers in terms of returns, asset allocation, or financial ratios?

Size vs. Performance: Is there any correlation between the size of the fund (in terms of total net assets) and its performance?

Effect of Sectors on Returns: Does investing in specific sectors tend to yield higher returns or lower risk?

Github team repo :

<https://github.com/abishekchiffon/Risk_prediction_Mutual_funds>

Source of data :

[European Funds dataset from Morningstar (kaggle.com)](https://www.kaggle.com/datasets/stefanoleone992/european-funds-dataset-from-morningstar)

Data has been scraped from the publicly available website of Morningstar UK website, https://www.morningstar.co.uk