Quantitative Analysis of HDFC Asset Management Company using Python

AGENDA

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I. Introduction

The project centered around employing advanced quantitative techniques to analyze HDFC Asset Management Company, a leading player in the financial services sector. Utilizing Python as the primary programming language and yfinance for fetching and manipulating financial data, the analysis aimed to provide a nuanced understanding of the company's financial health and performance.

Key Components of the Analysis:

- Data Collection with yfinance:
  - I utilized the yfinance library to fetch real-time financial data for HDFC Asset Management Company. This included retrieving historical stock prices, dividends, and other pertinent financial information.
- Quantitative Metrics:
  - Employing various quantitative metrics and financial ratios, I calculated key performance indicators to assess the company's financial stability, profitability, and growth potential.
- Fundamental Analysis:
  - The project involved a deep dive into the fundamentals of HDFC Asset Management Company. This encompassed examining financial statements, balance sheets, income statements, and cash flow statements to draw meaningful conclusions.
- Visualizations:
  - To enhance the interpretability of the analysis, I incorporated visualizations using Python libraries such as Matplotlib and Seaborn. Graphical representations were utilized to illustrate trends, patterns, and key insights derived from the data**.**

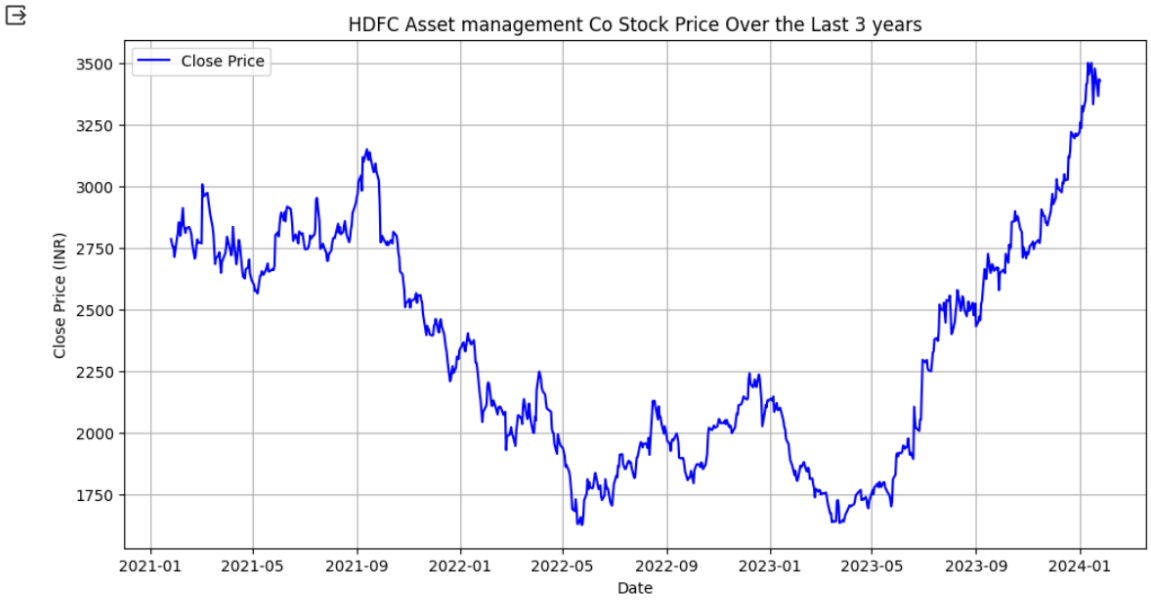
II. Data Collection and Libraries Used

```
[ ]  import pandas as pd
     import numpy as np
     import matplotlib.pyplot as plt
     import yfinance as yf
```

- **pandas** is employed for data manipulation and analysis.
- **numpy** is used for efficient numerical operations.
- **matplotlib.pyplot** is included for creating visualizations.
- **yfinance** is imported to access financial data for HDFC Asset Management Company.

III. Stock Price Analysis

```
[4]  HDFC_history=HDFC.history(period='36mo')
```



IV. Financial Statements Analysis

- First, I defined the stock symbol and used yfinance to fetch historical data covering the last three years. Subsequently, I visualized the closing stock prices over time through a clear and concise plot, emphasizing key labels such as date and close price.

```
HDFC_Financials = HDFC.financials[HDFC.financials.columns[-4:-1]]# reverse columns of past 3 years data
HDFC_BS = HDFC.balancesheet[HDFC.balancesheet.columns[-4:-1]]
HDFC_CF = HDFC.cashflow[HDFC.cashflow.columns[-4:-1]]
```

- This code efficiently extracts and organizes the financial data required for a comprehensive analysis, focusing on the income statement, balance sheet, and cash flow statement for HDFC Asset Management Company.

	2023-03-31	2022-03-31	2021-03-31
Ordinary Shares Number	213424716.0	213278552.0	212954202.0
Share Issued	213424716.0	213278552.0	212954202.0
Total Debt	1304700000.0	1096200000.0	1195500000.0
Tangible Book Value	60928400000.0	55166600000.0	47586400000.0
Invested Capital	61078600000.0	55300400000.0	47761800000.0
...	...	...	...
Cash Cash Equivalents And Short Term Investments	11310700000.0	13474600000.0	11286000000.0
Other Short Term Investments	11266100000.0	13455900000.0	11269200000.0
Cash And Cash Equivalents	44600000.0	18700000.0	16800000.0
Cash Equivalents	12300000.0	NaN	NaN
Cash Financial	32300000.0	18700000.0	16800000.0

Calculation of total asset and management

- **Total Current Assets (Total_Current_asset_HDFC):**

It aggregates various components such as current assets, other current assets, restricted cash, prepaid assets, and more, providing a comprehensive total.

- **Total Current Liabilities (Total_Current_Liabilities_HDFC):**

Similar to the process for current assets, this code combines different categories like other current liabilities, current debt, pension and other post-retirement benefits, and payables to calculate the total current liabilities.

```
# Calculating total current assets for HDFC Asset Management Company
Total_Current_asset_HDFC = (
    HDFC_BS.loc['Current Assets'].fillna(0) +
    HDFC_BS.loc['Other Current Assets'].fillna(0) +
    HDFC_BS.loc['Restricted Cash'].fillna(0) +
    HDFC_BS.loc['Prepaid Assets'].fillna(0) +
    HDFC_BS.loc['Other Receivables'].fillna(0) +
    HDFC_BS.loc['Taxes Receivable'].fillna(0) +
    HDFC_BS.loc['Accounts Receivable'].fillna(0) +
    HDFC_BS.loc['Cash Cash Equivalents And Short Term Investments'].fillna(0) +
    HDFC_BS.loc['Other Short Term Investments'].fillna(0) +
    HDFC_BS.loc['Cash And Cash Equivalents'].fillna(0) +
    HDFC_BS.loc['Cash Equivalents'].fillna(0) +
    HDFC_BS.loc['Cash Financial'].fillna(0)
).astype(int)

# Calculating total current liabilities for HDFC Asset Management Company
Total_Current_Liabilities_HDFC = (
    HDFC_BS.loc['Other Current Liabilities'].fillna(0) +
    HDFC_BS.loc['Current Debt And Capital Lease Obligation'].fillna(0) +
    HDFC_BS.loc['Current Capital Lease Obligation'].fillna(0) +
    HDFC_BS.loc['Pensionand Other Post Retirement Benefit Plans Current'].fillna(0) +
    HDFC_BS.loc['Payables'].fillna(0) +
    HDFC_BS.loc['Other Payable'].fillna(0) +
    HDFC_BS.loc['Total Tax Payable'].fillna(0) +
    HDFC_BS.loc['Accounts Payable'].fillna(0)
).astype(int)
```

V. Liquidity Ratios

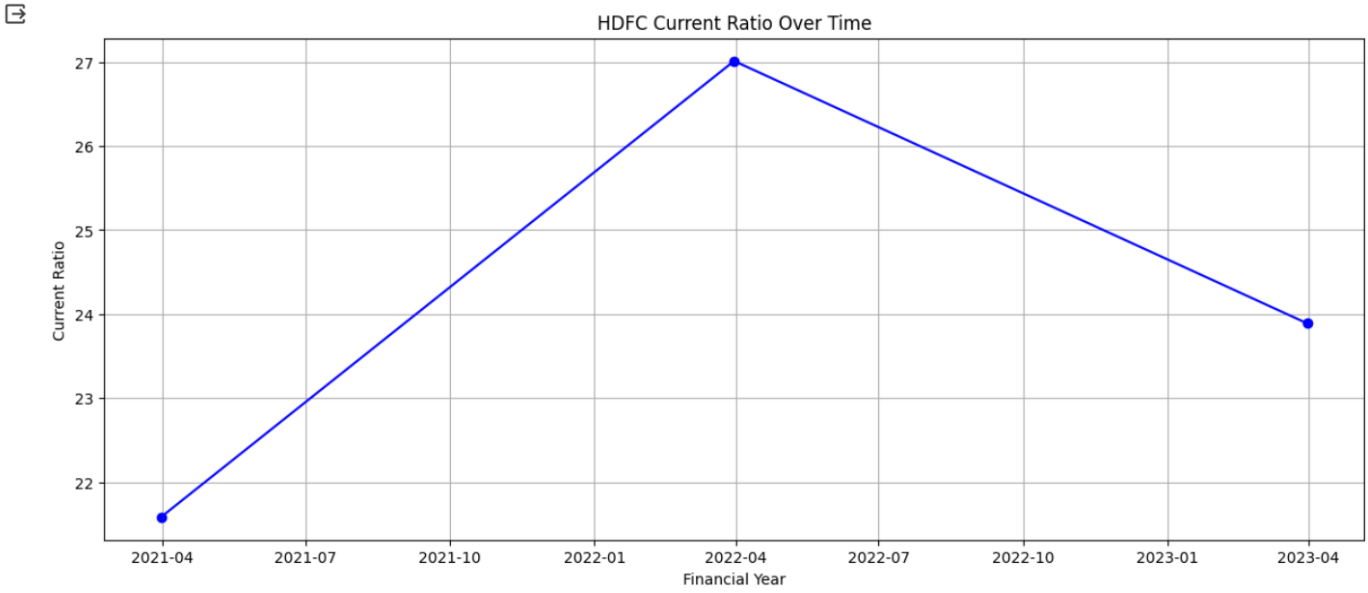
- Current Ratio:
  The Current Ratio is a liquidity ratio that assesses a company's ability to cover its short-term liabilities with its short-term assets.

- Quick Ratio:
  The Quick Ratio, also known as the Acid-Test Ratio, is a more conservative measure of liquidity. It assesses a company's ability to meet its short-term liabilities without relying on the sale of inventory.

```
print('Liquidity ratios')
print('-'*30)
print('Current Ratio')
# current ratio = Total Current Assets/Total Current Liabilities
HDFC_CR = Total_Current_asset_HDFC / Total_Current_Liabilities_HDFC # Total Current Assets/Total Current Liabilities
print(HDFC_CR,"\n")
print('Quick Ratio')
#Quick ratio = (Total Current Assets-Inventory)/Total Current Liabilities, no iventory
HDFC_QR =[Total_Current_asset_HDFC / Total_Current_Liabilities_HDFC.astype(int)]
print(HDFC_QR,"\n")
```

```
Liquidity ratios
------------------------------
Current Ratio
2023-03-31    23.890566
2022-03-31    27.013458
2021-03-31    21.584567
dtype: float64

Quick Ratio
[2023-03-31    23.890566
2022-03-31    27.013458
2021-03-31    21.584567
dtype: float64]
```



VI. Financial Efficiency Ratios

- Total Asset Turnover (TAT):
  The Total Asset Turnover ratio measures how efficiently a company utilizes its assets to generate revenue.
- Average Collection Period (ACP):
  The Average Collection Period represents the average number of days it takes for a company to collect payments from its customers.

Asset Utilization or Turnover ratios

```
print('Total Asset Turnover')
TAT_HDFC = HDFC_Financials.loc['Total Revenue'].astype(int)/HDFC_BS.loc['Total Assets'].astype(int)# Total Revenue / Total Assets
print(TAT_HDFC,"\n")
print('Average Collection Period')
ACP_HDFC= HDFC_BS.loc['Accounts Receivable'].astype(int) / (HDFC_Financials.loc['Total Revenue'].astype(int)/365) # Net Receivables/(Total Revenue/360)
print(ACP_HDFC,"\n")
```

```
Total Asset Turnover
2023-03-31    0.331512
2022-03-31    0.359732
2021-03-31    0.363619
dtype: float64

Average Collection Period
2023-03-31    30.951076
2022-03-31    12.859962
2021-03-31    15.744495
dtype: float64
```

VII. Financial Leverage Ratios

- Total Debt Ratio (TDR):
  The Total Debt Ratio is a financial leverage ratio that assesses the proportion of a company's assets financed by debt.
- Debt to Equity Ratio (DE):
  The Debt-to-Equity Ratio is another financial leverage metric that compares a company's total debt to its total equity.

These financial leverage ratios are crucial for understanding the capital structure and risk profile of HDFC Asset Management Company. The Total Debt Ratio provides an overall assessment of debt utilization in financing assets, while the Debt-to-Equity Ratio specifically examines the balance between debt and equity in the company's capital structure.

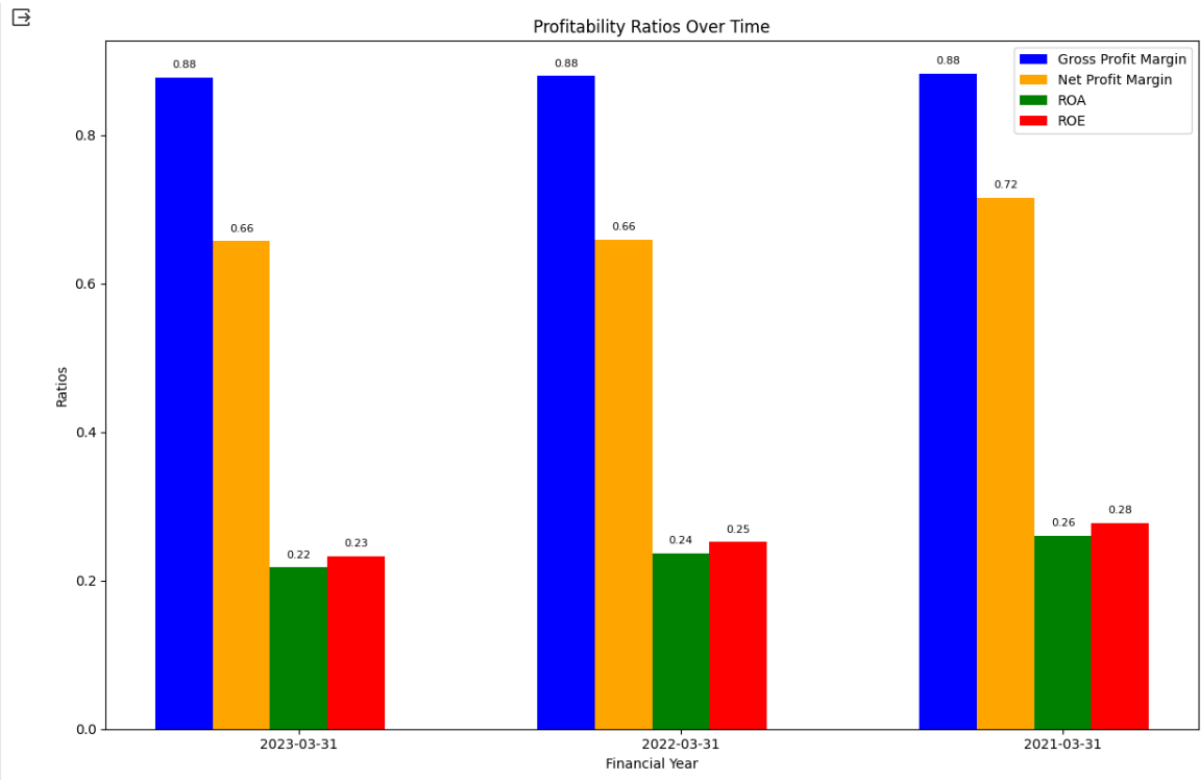
```
print('Financial Leverage ratios')
print('-'*40)
print('Total Debt Ratio')
HDFC_TDR = HDFC_BS.loc['Total Debt'].astype(int) / HDFC_BS.loc['Total Assets'].astype(int) # Total Liabilities / Total Assets
print(HDFC_TDR,"\n")
print('Debt to equity ratio')
HDFC_DE = HDFC_BS.loc['Total Debt'].astype(int) / HDFC_BS.loc["Stockholders Equity"].astype(int) # Total Liabilities / Total stockholders' equity
print(HDFC_DE,"\n")
```

```
Financial Leverage ratios
----------------------------------------
Total Debt Ratio
2023-03-31    0.019961
2022-03-31    0.018642
2021-03-31    0.023466
dtype: float64

Debt to equity ratio
2023-03-31    0.021361
2022-03-31    0.019823
2021-03-31    0.025030
dtype: float64
```

VIII. Profitability Ratios

- Gross Profit Margin (GPM):
  The Gross Profit Margin measures the percentage of revenue retained after subtracting the cost of goods sold.
- Net Profit Margin (NPM):
  The Net Profit Margin assesses the percentage of revenue retained as net income after deducting all expenses.
- Return on Assets (ROA):
  Return on Assets measures the company's ability to generate profit from its total assets.
- Return on Equity (ROE):
  Return on Equity assesses the company's profitability in relation to its shareholders' equity.
- Earnings Per Share (EPS):
  Earnings Per Share measures the portion of a company's profit allocated to each outstanding share of common stock.


Profitability Ratios Over Time
Gross Profit Margin
Net Profit Margin
ROA
ROE
Ratios
0.0
0.2
0.4
0.6
0.8
0.88
0.66
0.22
0.23
0.88
0.66
0.24
0.25
0.88
0.72
0.26
0.28
2023-03-31
2022-03-31
2021-03-31
Financial Year

IX. Valuation Ratios

- Price-to-Earnings Ratio (PE Ratio):
  The Price-to-Earnings Ratio evaluates the market's expectations for future earnings growth.
- Price-to-Book Ratio (PB Ratio):
  The Price-to-Book Ratio compares the market price per share to the Book Value per share.

These valuation ratios offer insights into how the market perceives HDFC Asset Management Company in terms of earnings potential (PE Ratio) and book value (PB Ratio). Investors use these ratios to make informed decisions about the company's stock based on its current market price relative to its financial performance and net asset value**.**

```
print('PE Ratio')
HDFC_PE = HDFC.info['currentPrice'] / HDFC_EPS.astype(int)  # Market price  / EPS
print(HDFC_PE,"\n")
print('PB Ratio')
HDFC_PB = HDFC.info['currentPrice'] /(HDFC_BS.loc['Tangible Book Value']/HDFC_BS.loc['Share Issued']).astype(int)  # Market price  / Book value per share
print(HDFC_PB,"\n")
```

```
PE Ratio
2023-03-31    51.949242
2022-03-31    52.748462
2021-03-31    55.300806
dtype: float64

PB Ratio
2023-03-31    12.030351
2022-03-31    13.289341
2021-03-31    15.375112
dtype: float64
```