

Mutual Funds - Project }

- Data

- Build MF Layer with NAV Data
- Use AMFI Data
- Components of AMFI Data

Column Name -

① Scheme Code - Unique Code assigned by AMFI to each mutual fund.

②

ISIN Div Payout / ISIN - (International Security Identification Number) for Dividend payout Growth Options for the Scheme

In MF each Scheme & each option within it has its own ISIN. AMFI Scheme often comes with Multiple plan options such as:

① Growth Option →

In the Growth Option, any profits, dividends or gains made by the fund are not paid to you as cash instead they are reinvested back to the scheme. This leads to compounding - your money grows over time as returns are added back for eg:-

You invest 1,00,000 in Growth option. The fund earns dividends & gains over 5 years NAV increases from 100 to 800 in 5 years

Your investment becomes ₹ 1,80,000

Key Points → Best for long term investors, No periodic cash flows, Tax on gain only when you sell units

② Dividend Payout Option

In this option, the fund pays out dividends (when it earns distributable surplus) directly to your bank account

NAV drops whenever a dividend is paid because that amt is taken out of the fund's assets.

Eg: You invest ₹ 1,00,000. NAV is ₹ 100. The fund declares a dividend of ₹ 5/unit. You receive ₹ 5000, if you hold 1000 units. The NAV drops to ₹ 95

Key Points → Suitable if you want regular cash income (like retirees). Dividend not guaranteed - depends on fund performance. Dividends are taxed as per your income tax slab since April 2020.

③ Dividend Reinvestment Option

Dividends declared are not paid out in cash. Instead they are used to buy additional units of the same scheme at the prevailing NAV.

No. of NAVs increase over time

Div declared = ₹ 5./unit

You hold 1000 units → ₹ 5000 div

NAV ₹ 95 prevailing → $5000 / 95 \approx 52.63$ new units

Total units = 1052.63

Purchased through the website of AMCs.

Date _____
Page _____

Key Points:-

- Good if you don't need immediate cash but want to reinvest
- Still taxed as dividends in your hands

④ Direct Plan (Zerodha, Growth, Coin)

A direct plan means you invest directly with the mutual fund house without involving any intermediaries or distributors

No commission or distribution fees

lower expense ratio → slightly higher returns over long term

- Give Right NAV over time

⑤ Regular Plan

A Regular Plan is where you invest through an intermediaries. The Asset Management Company pays them a Commission out of your investment. It pays them a

Higher expense ratio

Feature

Best for

- Growth
- Dividend
- Dividend Reinvestment
- long term growth
regular income
long term with reinvestment

→ Md G Eall

classmate

classmate

classmate

- ② Scheme Name → Full Name of mutual fund Scheme. Includes fund name, house, category, & plan type & option
- NAV → NAV of the Scheme on the given date. Represents per unit price of the Scheme
- Repurchase Price → Price at which the AMC will buy back the units from the investor.
- Date - Date on which the NAV was published (typically EOD)

Some more insights on Scheme Name:-

③ Fund House (AMC)

They create, manage & operate multiple mutual fund schemes under their brand

Eg of Fund Houses

○ SBI MF ○ HDFC MF ○ ICICI Prudential MF
○ Axis MF ○ Nippon India MF

Mutual Funds are investment vehicles that pool money from many investors to purchase a diversified portfolio of securities. AMCs manage these funds, making investment decisions & handling the operational aspects of the fund

Mutual Funds collect money from various investors both individuals & institutions. This pooled money is then invested in a variety of financial instruments like stocks, bonds & other securities.

204
- NAV - updated every business day

$$\text{NAV} = \frac{\text{Total Assets} - \text{Liabilities}}{\text{No. of units Outstanding}}$$

Repurchase Price $\frac{\text{No. of units Outstanding}}{\text{NAV}}$
 Might differ from NAV if there are loads (entry/exit charges)

For most Direct Plans = NAV

How to Use the Columns? (Generic view)

Scheme Code - Primary key to join with the metadata
 (Category, Risk, ADM)

* CAGR (Compounded Annual Growth Rate (Performance metric))

$$\text{CAGR} = \left(\frac{\text{NAVend}}{\text{NAVstart}} \right)^{\frac{1}{n}} - 1$$

$n \rightarrow$ no. of years

Evaluate MF Performance :-

A. Returns \rightarrow How much Profit?
 (Did the fund generate good wealth?)

Metrics :-

1. Absolute Return.

Simple return over a period

$$\frac{\text{NAVend} - \text{NAVstart}}{\text{NAVstart}} \times 100$$

NAVstart

2. CAGR (more realistic)

$$\text{CAGR} = \left(\frac{\text{NAV}_{\text{end}}}{\text{NAV}_{\text{start}}} \right)^{\frac{1}{n}} - 1$$

Tell me: What if I invested for 3 years?

B RISK - How volatile is it?

~~C~~ How much does the fund's return swing up/down?

Metrics:

1. Standard Deviation (Volatility)

Measures how much the fund's daily returns fluctuate
Higher = more volatile (riskier)

$$\sigma = \sqrt{\frac{\sum (R_i - \bar{R})^2}{N-1}}$$

2. Beta (Market Risk)

- Measures fund's sensitivity to market movements

$\beta = 1 \rightarrow$ moves like the market

$\beta > 1 \rightarrow$ " volatile than market

$\beta < 1 \rightarrow$ less volatile (safer)

3. Max Drawdown

- Largest peak-to-trough NAV drop

- Shows worst-case loss

4. Downside Risk

- 6 of -ve returns only

~~C~~ Risk - Adjusted Performance - Returns per unit of risk

204

Metrics :-① **Sharpe Ratio**

Measures excess return per unit of total risk

$$\text{Sharpe Ratio} = \frac{R_p - R_f}{\sigma_p}$$

 $R_p \rightarrow$ portfolio return $R_f \rightarrow$ risk free return (e.g. 10 yrs govt bond yield ~%) $\sigma_p \rightarrow$ standard deviations of returns

Higher = better (more reward for each unit of risk)

② **Sortino Ratio :-**

Like Sharpe but considers only downside risk

D Consistency \rightarrow Is it steady over time?① **Rolling Returns :-**• Average returns over overlapping periods
(e.g. every 1Y window in last 5Y)

• Shows how consistently fund delivers

② **Upside Capture Ratio :-**

• How well fund performs when market goes up

③ **Downside Capture Ratio :-**

• How well fund protects during market fall

Summary Table of Metrics

Metric	What It Shows	Ideal for
CAGR	Growth over time	All Investors
Std Dev (Volatility)	Risk (price swings)	Risk profiling
Sharpe Ratio	Return per unit risk	Comparing Funds
Max Drawdown	Worst loss in %	Defensive Investing
Beta	Sensitivity to Market	Market tied funds
# Mutual Fund Categories - 8 (Written beside AMC name)		
① Equity funds → These invest mostly in stocks (share of companies). Suitable for long term wealth creation but come with higher risk.		
Subcategories:-		

Category	What It Means	Risk Level	Return
Large Cap	Invests in top 100 companies by market Capitalization. These are big, stable companies	Moderate	10-12%
MidCap	Invests in companies ranked #101-250 by market cap	Med-High	12-15%

Smallcap	Smaller firms, higher volatility	High	15 - 20%
Multi Cap	Smarts across large, mid & small cap stocks. Diversified exposure	Med	11 - 14%

Mutual Fund
Like Multi Cap, but fund manager has flexibility to change allocation as per market condition

Plan Cap Like Multi Cap, but fund manager invests in equity with 3 year lock in period. Tax benefit via SDC

② Debt funds

These invest in fixed income securities like bonds, government securities, treasury bills - safer than equity funds.

Category	Risk Level	Return
Liquid Funds	Low	4 - 6%
Short Duration Debt funds	Low-Med	5 - 7%

Category	Risk Level	Return
Long Duration Debt funds	Med	6 - 8%
Corporate Bonds	High	7 - 10%

Gilt funds Invest in government bonds
Only (low credit risk) Low-Med 5%

Corporate Bond funds Invest in highly rated corporate bonds Low-Med 6-8%.

Credit/Risk funds Invest in lower rated bonds High 7-9%
with higher yields

3 Hybrid funds (HF)

They invest in mix of equity & debt. Balanced approach
for moderate risk investors.

Category LoRat H Means Risk Avered Returns

Difference ~65-80% in equities + Medium-High 10-12%
HF ~80-85% in debt. Higher

Equity exposure

Conservative ~10-25% in equity + Low - Med 6-9%
HF ~75-90% in debt, lower

Equity exposure

Balanced advantage Dynamically adjust equity Med 8-11%
funds Debt allocation as market conditions

Equity Sourcing Mix of equity, arbitrage & debt Low 5-7%
funds for very low risk

4 Other / Speciality funds

Category

What it Means?

Risk Level Returns

Sector / Thematic funds Invest only in **specific** sectors (like Pharma, Banking or themes like ESG, EV)

Very High 15-20%

+

Index funds Passively tracks a stock market index (like Nifty 50, Sensex)

Moderate, Match Stock / bonds directly

India

Fund of Funds Invests in other MF instead of stocks / bonds directly

Varies Varies

India

International funds Invests in overseas market or global companies

High 10-15%

Risk & Returns Snapshot:

fund category	Typical Risk Level	Suitable for
Large Cap	Moderate	Beginners, conservative investors
Mid Cap	Med - High	Long term investors

Small Cap	Hugh	Degressive Inv
ELSS	Med - High	Tax Saving, long term
Debt Funds	Low - Medium	Short term goals, low risk

Rubia funds	Med	Moderate risk Investors
Sector funds	Very High	Experienced Investors only
International funds	High	Portfolio - diversified

1st Step

- Download the latest NAV All .txt from AMFI
- Find the header line
- Extract header & data lines
- Parse data to a Dataframe
- Clean up rows
- NAV to numeric ; Date → todatetime