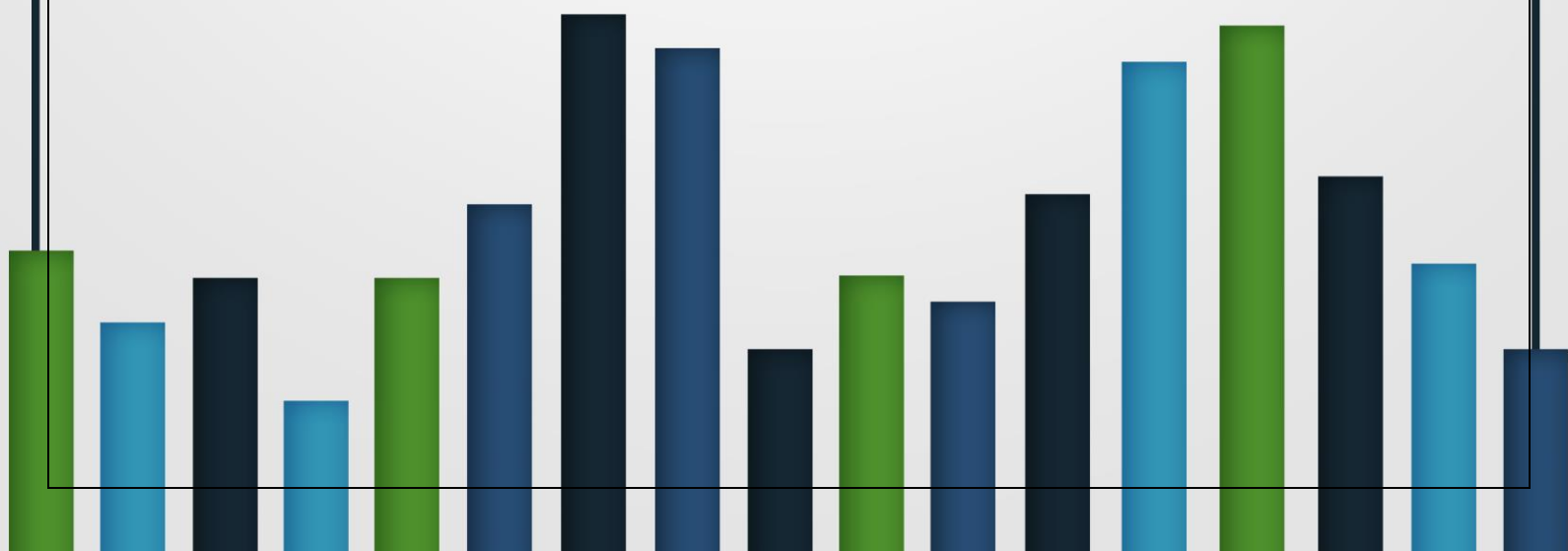


# **TEAM 12** | DATA ANALYTICS REPORT

## ANALYSIS OF MUTUAL FUNDS HOUSES

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# Data

New Parameters (Socio-Economic and others) considered for model fine tuning and accuracy improvement:

## Global Level

*Given in the problem statement*

1. Daily US\$ to Indian Currency Exchange Rate
2. Daily Index of US Stock Market (S&P, NASDAQ)

*New:*

1. Movement in Global Markets( change of NSE rankings in global markets- steep appreciation)
2. Daily index of Chinese stock market
3. Services Capital
4. Inflation rate w.r.t. to other countries
5. Changes in Mutual fund industry management structure
6. Advertisement

## India Level

*Given in the problem statement:*

1. Index of various Commodity or Metal Markets
2. Indian GDP (Quarterly Data is available)
3. Indian CPI (Monthly Data available)
4. Monthly or quarterly Per Capita Income
5. Monthly or quarterly Per capita Expense
6. Industry / Sector Beta in Stock market

*New:*

1. Rate of inflation
2. Population-India's population is young, with 54% under the age of 25 and 80% under 45 and the percentage of working population is rising rapidly
3. Savings and consequent flows into equity markets( rising household savings)
4. Increased household consumption
5. Significant increase of labor supply
6. Risk percentage in India
7. Comprehensive regulatory framework
8. Investor education campaign ( that is going on in the country)
9. Rapid introduction of new products in the markets
10. Psychological effect seeing increasing investments in mutual funds( Most of the investors Accept the fact that investing in mutual fund will lead to economic development.)
11. Investors satisfaction rate with regard to mutual fund investors
12. Economies of scale
13. Advertisement

### **Fund level:**

*Given in the problem statement:*

1. Age of the Fund
2. Age of the Fund House
3. Minimum Investment
4. NAV
5. Asset Under Management
6. Crisil Ranking

*New:*

1. Fund size
2. Performance record of the scheme or fund
3. Brand name (using number of complaints as a proxy)
4. Expense ratio
5. Portfolio constituents
6. Reputation of Portfolio managers or fund itself
7. Withdrawal facilities
8. Ratings and reviews
9. Innovativeness of the scheme
10. Load free exit and entry
11. Diversification
12. Benefits with tax
13. risk-return
14. Difficulty in selection of schemes
15. Bitter past experience
16. Advertisement
17. Morning star ratings ( it can give you a sense of a fund's risk-adjusted return and how well it has performed relative to others in its category)
18. Experience of fund managers
19. % of capital invested in the research strategies in the fund
20. Total turnover and capital
21. Transparency
22. Economies of scale
23. Add-ons provided by the funds

From the annual reports of the fund houses, we tried to extract the following features too: Liabilities (current and non-current), profit after tax, cash flow from financial activities, reserve surplus and long term litigation which we found relevant after reading papers.

We considered the above mentioned features at these three levels (Global, Indian and Fund level) and extracted all the possible features by restricting ourselves to the websites mentioned to improve our models and confidence in them. Due to some poor and broken data available, we had to drop few factors from the above list. However, all the data available on the mentioned websites in the problem statement is in the data files sent along with the report.

### **Data Scraping:**

Manual data scraping is both prone to error and is slow. So, we used Python's Selenium and PyAutoWin libraries to visit and the list of sites and collect data of our interest. We had to program once for a selected set of features that can be extracted in a similar fashion, and automate the task. Each collected data was then converted into CSV format, and was finally added to each of the dataset, depending on what sort of feature we had scrapped.

### **Dataset making:**

Initially we had been provided with 8 datasets of mutual fund houses. The schemes of each fund house are again divided by type of funds. So we finally had 12 datasets, each for one fund type. We appended each of the thus formed 12 dataframes into made a list and stored them in pickle file. Every new features that we made were appended into this list of datasets. The level of granularity of different features were different, for example, the data of NAV was available on a daily basis where GDP was available only on quarterly basis. So, we brought every feature into a single level of granularity (per month). We grouped each data sample, by the scheme ID and month. Concatenating all such dataframes, we finally had one master dataset that we worked upon.

## **Part A) Performance of Mutual funds based on NAV, AUM, NAV growth, AUM growth:**

For the first part of problem:

- Made bins of the NAV, AUM, NAV growth and AUM growth.
- Plotted histograms and probability density function curves for the same.
- Applied **JARQUE-BERA** test on samples  
**Result : Samples do not follow Normal Distribution**
- So, used **Kruskal-Wallis test** for comparing performance of Fund Houses in terms of NAV,NAV growth,AUM,AUM growth because it is a Non-parametric test which does not have any assumptions about distribution of samples

### **Year wise analysis of performance of fund house:**

For every year we are predicting performance with 99% confidence(since in code we have set p-value to 0.01)

#### **○ Performance based on year :**

##### **YEAR 2013**

Treatments with the same letter are not significantly different.

#### **• Performance based on NAV:**

UTI Mutual Fund	265268.9	a
SBI Mutual Fund	252729.8	b
Aditya Birla Sun Life Mutual Fund	236918.4	c
Reliance Mutual Fund	225692.3	d
HDFC Mutual Fund	215715.2	e
Tata Mutual Fund	213538.9	f
Sundaram Mutual Fund	182110.4	g
ICICI Prudential Mutual Fund	175131.6	h

**Interpretation :** For the year 2013 if NAV is taken as performance metric then above table gives ranking order with UTI Mutual Fund house performing best

• **Performance based on NAV growth:**

ICICI Prudential Mutual Fund	191859.2	a
Reliance Mutual Fund	189846.5	b
UTI Mutual Fund	189710.1	b
Aditya Birla Sun Life Mutual Fund	189141.0	b
Tata Mutual Fund	187775.9	c
HDFC Mutual Fund	187376.5	c
Sundaram Mutual Fund	182359.8	d
SBI Mutual Fund	175532.6	e

**Interpretation :** From above table we can see that there is not much difference in performance of Reliance,UTI,Aditya Birla Sun Life Mutual fund.Even there is not much difference in performance of Tata and HDFC Mutual fund houses.We can say ICICI is best for the year 2013 on basis of NAV growth.

• **Performance based on AUM:**

HDFC Mutual Fund	5055.265	a
SBI Mutual Fund	4283.214	b
Aditya Birla Sun Life Mutual Fund	4281.408	b
UTI Mutual Fund	4108.901	bc
Reliance Mutual Fund	3966.983	c
ICICI Prudential Mutual Fund	3649.672	d
Tata Mutual Fund	3324.846	e
Sundaram Mutual Fund	3298.467	e

**Interpretation :** From the above table we can infer that HDFC performs best.Performance of UTI is slightly less than Aditya Birla Sun Life Mutual Fund.There is not much difference in performance between TATA and Sundaram Mutual Fund.

• **Performance based on AUM growth:**

UTI Mutual Fund	3327.321	a
SBI Mutual Fund	3274.532	a
HDFC Mutual Fund	3264.478	a
Reliance Mutual Fund	3022.115	b
Aditya Birla Sun Life Mutual Fund	3009.443	b
Sundaram Mutual Fund	3004.410	b
Tata Mutual Fund	2996.005	b
ICICI Prudential Mutual Fund	2584.911	c

**Interpretation :**

Similarly, we have ranked performance of fund houses for years 2014,2015,2016 and 2017.

○ **Performance based on Fund Types:**

"Open Ended Schemes ( Balanced )"

• **Performance based on NAV:**

Tata Mutual Fund	38499.33	a
SBI Mutual Fund	37092.73	b
HDFC Mutual Fund	33757.61	c
Aditya Birla Sun Life Mutual Fund	31345.54	d
UTI Mutual Fund	27842.38	e
Sundaram Mutual Fund	27543.74	e
ICICI Prudential Mutual Fund	21245.97	f
Reliance Mutual Fund	19765.85	g

**Interpretation :** For the year 2013 if NAV is taken as performance metric then above table gives ranking order with TATA Mutual Fund house performing best

• **Performance based on NAV growth:**

Reliance Mutual Fund	30866.44	a
SBI Mutual Fund	30829.00	a
ICICI Prudential Mutual Fund	30749.21	a
HDFC Mutual Fund	30747.23	a
Aditya Birla Sun Life Mutual Fund	30472.16	a
UTI Mutual Fund	30470.01	ab
Tata Mutual Fund	30415.69	ab
Sundaram Mutual Fund	29868.65	b

**Interpretation :** There is not much difference in performance of Fund houses in the fund type Open Ended Schemes ( Balanced )

• **Performance based on AUM:**

HDFC Mutual Fund	617.6016	a
SBI Mutual Fund	610.5556	a
Tata Mutual Fund	532.6536	b
UTI Mutual Fund	504.1250	bc
Reliance Mutual Fund	466.3704	bc
Aditya Birla Sun Life Mutual Fund	457.9318	c
ICICI Prudential Mutual Fund	445.7885	c
Sundaram Mutual Fund	233.7447	d

**Interpretation :** If AUM is taken as performance metric there is not much difference in performance between HDFC and SBI and both can be considered better when compared to rest fund houses. The value “bc” indicates that performance of UTI Mutual Fund is slightly better than Aditya Birla and slightly less than TATA.

• **Performance based on AUM growth:**

Reliance Mutual Fund	572.9703	a
Aditya Birla Sun Life Mutual Fund	562.8306	ab
SBI Mutual Fund	551.5455	abc
ICICI Prudential Mutual Fund	497.6907	bcd
UTI Mutual Fund	477.5395	cd
HDFC Mutual Fund	438.9091	de
Tata Mutual Fund	393.9861	e
Sundaram Mutual Fund	382.8764	e

**Interpretation :** If AUM growth is taken as performance metric then we can see reliance has performed best. Value “ab” corresponding to Aditya Birla suggests that its performance is slightly below Reliance Mutual Fund.

**Similarly, we have ranked performance of fund houses for other fund types as well**

○ **Performance of fund houses for past five years**

• **Performance based on NAV :**

SBI Mutual Fund	1362760.3	a
Aditya Birla Sun Life Mutual Fund	1305288.1	b
UTI Mutual Fund	1297018.1	c
Tata Mutual Fund	1293071.0	d

HDFC Mutual Fund	1187599.1	e
Reliance Mutual Fund	1152078.2	f
Sundaram Mutual Fund	1061244.0	g
ICICI Prudential Mutual Fund	976259.7	h

**Interpretation :** If NAV is taken as performance metric than we can say that SBI mutual funds performance is best.

• **Performance based on NAV growth**

UTI Mutual Fund	1047662	a
Aditya Birla Sun Life Mutual Fund	1040138	b
Reliance Mutual Fund	1035225	c
HDFC Mutual Fund	1030329	d
Tata Mutual Fund	1026751	e
ICICI Prudential Mutual Fund	1020703	f
SBI Mutual Fund	1009799	g
Sundaram Mutual Fund	1009612	g

**Interpretation :** If NAV growth is taken as performance metric than we can say that UTI mutual funds performance is best and there is not much difference between SBI and Sundaram Mutual Fund.

• **Performance based on AUM**

HDFC Mutual Fund	25310.28	a
SBI Mutual Fund	22297.15	b
Aditya Birla Sun Life Mutual Fund	20659.99	c
UTI Mutual Fund	19899.12	d
Reliance Mutual Fund	19451.71	e
ICICI Prudential Mutual Fund	17002.58	f
Tata Mutual Fund	16181.02	g
Sundaram Mutual Fund	15329.63	h

**Interpretation :** If AUM is taken as performance metric than we can say that SBI mutual funds performance is best.

• **Performance based on AUM growth**

SBI Mutual Fund	19923.86	a
UTI Mutual Fund	19511.81	ab
HDFC Mutual Fund	19364.17	bc
Aditya Birla Sun Life Mutual Fund	18949.26	c
Tata Mutual Fund	18462.54	d
Reliance Mutual Fund	17885.67	e
Sundaram Mutual Fund	17537.37	e
ICICI Prudential Mutual Fund	16307.50	f

**Interpretation :** If AUM growth is taken as performance metric than we can say that SBI mutual funds performance is best. Performance of UTI Mutual fund is slightly less than that of SBI. There is not much difference in performance between Reliance and Sundaram Mutual performance.



## Part B) Developed Feature Selection Method:

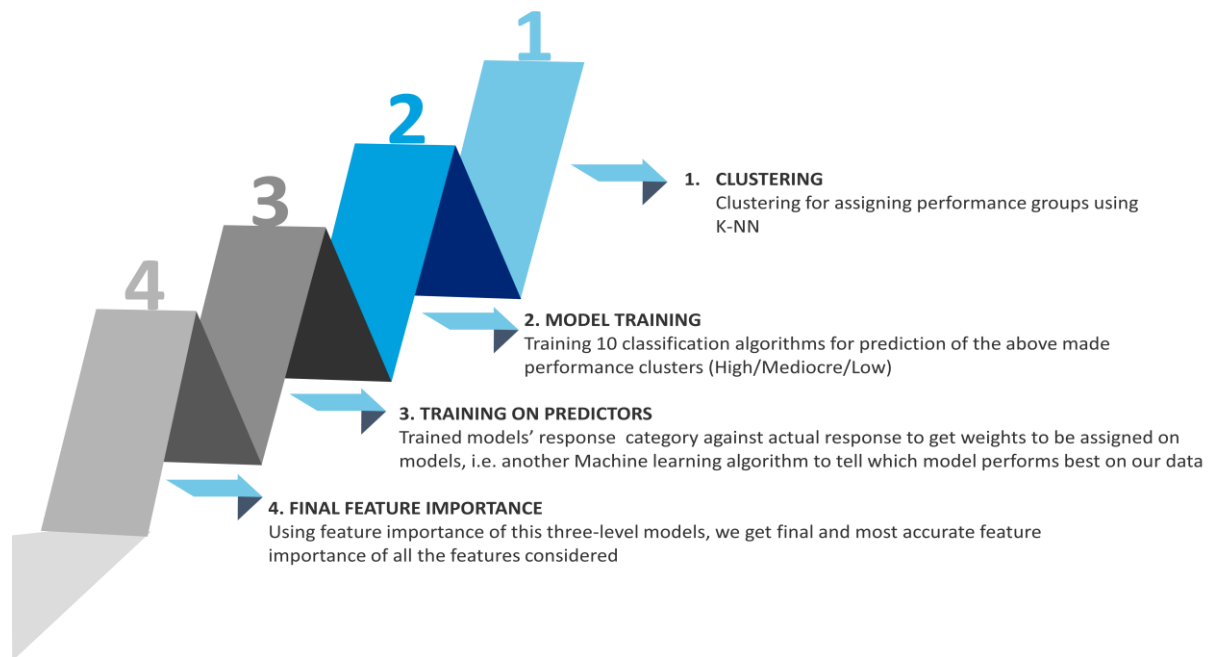


Figure 1: Steps followed for extracting feature importance (4-Level Model)

First we imported the scraped dataset which contained all the columns having significant importance which we tested earlier and all the rows being different schemes offered by the fund houses. After importing the dataset we divided it in two parts considering the target variable to be **NAV** or **NAV Growth** or **AUM** or **AUM growth** (we have to choose the target variable alternatively). We have to repeat the code whole code 4 times as to get the feature effectiveness of each feature which we have in our dataset to these of our 4 target variables.

At first, we set the target variable to be **NAV\_mean** (we are using the mean value of the target variable over the timeframe the ). This variable was stored in 'y'. The rest of the dataset was stored in 'X'. Then we applied **k-means clustering** on 'y'. For this we, at first, found out the values of **WCSS**(Within Cluster Sum of Squares) for different number of clusters. Then we visualised the values of WCSS along with the number of clusters and found out the ideal number of clusters which we can use by using the **elbow method**.

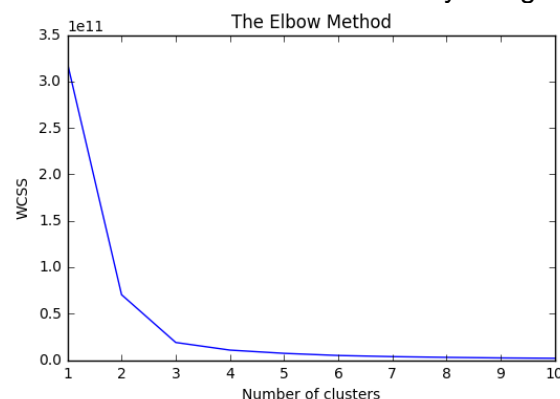


Figure 2: Elbow method result for selecting optimal number of clusters

By using the elbow method, we looked at the point after which the rate of decrease of WCSS was not steep as before that point. So at that point we will get the ideal number of clusters as even after we increase the number of clusters, even though it will reduce the WCSS but it will not change WCSS that significantly as compared to before. After determining the ideal number of clusters, which was found out to be 3, we again clustered the rows on the basis of variable 'y' this time using the 3 clusters. By doing this we assigned each observation to a group on the basis of our target variable.

Then we used train-test split to split the dataset into training and testing dataset which were 70 and 30 percent of our original dataset respectively. This was done considering the fact that we want to use classification models on our dataset next and for this we will need two different set of datas. Also we applies standard scalar to scale our dataset as some of our classification algorithms will work more faster and accurately when the data is scaled up. We stored the scale data in separate variable known as 'X\_train\_sc' and 'X\_test\_sc'.

We then applied **10 different classification algorithms** on our training dataset and found our correspondingly 10 different list of predicted values. We used many different types of algorithms ranging from the standard algorithms to the latest algorithms like LightGBM.

These 10 classification algorithms were as follows :

1. Support Vector Machine (SVM)
2. Kernel SVM
3. Random Forest
4. Extreme Gradient Boosting (XGBoost)
5. Light Gradient Boosting Machine (LightGBM)
6. Extra Trees
7. Logistic Regression
8. Artificial Neural Networks (ANN)
9. K Nearest Neighbours (KNN)
10. Decision Tree

Our main target for doing what we have done until now was to get to **feature importance of the variables**. Actually we are trying to find out the importance that a particular algorithm gives to a feature while using it to classify the data. We wanted this importance so that we can determine which of our variables are most important in deciding our target variable. So out of all the algorithms that we used we found the variables importances in the case of these algorithms, as they have inbuilt functions in them to get variable importance:

1. Support Vector Machine (SVM)
2. Random Forest
3. Extreme Gradient Boosting (XGBoost)
4. Light Gradient Boosting Machine (LightGBM)
5. Extra Trees

So the importance variable (which have feature importance data for the variables for all the above mentioned algorithms) that we have got from these algorithms were actually like the weights of the features of our dataset 'X' which were responsible for predicting the value of target variable 'y', according to that algorithm. So we have 5 separate feature importance datas and we have named the variables 'importance' in our code. These helped us in determining the real importance of a variable, but the main problem was that we can not give equal weight to finding of each algorithm so that is why we can't just take average of all the importance.

So, for finding out the importance of each algorithm we decided to use one more classifier algorithm which would take input dataset as the combined dataframe of feature importance which we got by our algorithms and use the target variable as y\_pred.

So we combined the predicted values of all the 10 classifiers into one single dataset and trained it with **XGBoost** algorithm with the target variable being 'y\_pred'. After doing this we obtained the feature importance from this recent classifier and then with the feature importance data we obtained the weights for the feature importance list of our classifiers. We multiplied these weights to their corresponding feature importance data and found out the final importance which will give the importance of the variable in effecting the target variable.

The following are the final important features which affects the NAV:

1. Trade.Balance.oil
2. Open
3. Leather & Leather Products
4. Chemicals & Chemical Products
5. Fertiliser
6. Per Capita PFCE
7. Per Capita NNI
8. Valuables
9. Indirect Taxes Less Subsidies
10. NDP at Market Prices
11. GDP at Market Prices
12. NVA at Basic Prices
13. NNP at Market Prices
14. GVA at Basic Prices
15. GNP at Market Prices

The following are the final important features which affects the AUM:

1. CPI\_rural
2. CPI\_industrial\_general
3. CPI\_comb
4. CPI\_urban
5. CPI\_industrial\_food
6. CPI\_agri\_labours
7. Industries
8. Change in Stock
9. FDI by India
10. Wood & Wood Products
11. Discrepancies
12. Credits.Metropolitan.Accounts
13. Other Infrastructure
14. GDP
15. dependency ratio

## **Part C) Feature importance using Regression models**

- Pre-processed the data and encoded the dataset with object type columns.
- Splitted the dataset into train and test set. Applied feature scaling to standardize the range of independent variables and dependent variables.
- **Applied different types of regression technique to predict the target variable.**

We used following regression techniques to predict the target variable: -

- 1) Lasso Regression
- 2) Ridge regression
- 3) Linear Regression

- 4) Least Angle Regression
- 5) Random Forest Regressor
- 6) KNeighborsRegressor
- 7) Support Vector Regression (SVR)
- 8) Extra Tree Regressor
- 9) XGBRegressor

**Feature importance from Regressor:** - We got feature importance from Random Forest Regressor, XGBRegressor, Extra Tree Regressor. We sorted the important features in decreasing order for all regressor which gave feature importance.

**1. Feature Importance keeping NAV as a target variable:**

<u>1. XGboost</u>		<u>2. Extra tree regressor</u>		<u>3. Random forest</u>	
Features	Importance (F-score)	Features	Importance	Features	Importance
Consumption of Fixed Capital	81	Fund House_Aditya Birla Sun Life Mutual Fund	0.650900000000000003	Fund House_Aditya Birla Sun Life Mutual Fund	0.135500000000000001
CPI_rural	61	Fund House_Reliance Mutual Fund	0.082199999999999995	Fund House_HDFC Mutual Fund	0.088900000000000007
Credits.SemiUrban.Accounts	59	Change in Stock	0.021999999999999999	Deposits.Urban.Amount	0.086499999999999994
Cotton Textiles	56	GFCE	0.0206	inflation	0.046600000000000003
CPI_agri_labours	55	Open	0.02	Fund House_UTI Mutual Fund	0.044200000000000003
Close	50	EURO	0.015699999999999999	Low	0.043299999999999998
CPI_industrial_food	41	Fund House_Tata Mutual Fund	0.015599999999999999	GDP	0.039600000000000003

**2. Feature Importance keeping AUM as a target variable:**

<u>1. XGboost</u>		<u>2. Extra tree regressor</u>		<u>3. Random forest</u>	
Features	Importance (F-score)	Features	Importance	Features	Importance
CPI_industrial_food	96	Fund House_HDFC Mutual Fund	0.1676	Fund House_HDFC Mutual Fund	0.1174

Close	48	Term Money Borrowings	0.126	Term Money Borrowings	0.095799999999999996
Deposits.Rural.Accounts	47	Fund House_Tata Mutual Fund	0.089200000000000002	Fund House_Tata Mutual Fund	0.062
Credits.Rural.Accounts	43	Fund House_UTI Mutual Fund	0.055	Fund House_SBI Mutual Fund	0.0579
Deposits.Metropolitan.Accounts	41	Fund House_Sundaram Mutual Fund	0.054100000000000002	Turnover_(Rs._Cr)	0.048599999999999997
Credits.Rural.Amount	40	Credits.Metropolitan.Accounts	0.044900000000000002	Fund House_Aditya Birla Sun Life Mutual Fund	0.047300000000000002
Deposits.Metropolitan.Amount	33	Term Deposits	0.035200000000000002	Fund House_UTI Mutual Fund	0.042799999999999998

### 3. Feature Importance keeping AUM growth as a target variable:

<u>1. XGboost</u>		<u>2. Extra tree regressor</u>		<u>3. Random forest</u>	
Features	Importance (F-score)	Features	Importance	Features	Importance
Cement & Cement Products	125	FundType	0.58289999999999997	FundType	0.56079999999999997
Change in Stock	114	Fund House_Aditya Birla Sun Life Mutual Fund	0.29609999999999997	Fund House_Aditya Birla Sun Life Mutual Fund	0.2641
Cotton Textiles	99	Fund House_Sundaram Mutual Fund	0.025100000000000001	Term Money Borrowings	0.038899999999999997
CPI_rural	99	Term Money Borrowings	0.021899999999999999	CPI_industrial_general	0.020799999999999999
Close	60	Term Deposits	0.021299999999999999	Total (5+6+7)	0.016799999999999999

Construction	32	CPI_industrial_general	0.02089999999999998	GVA at Basic Prices	0.0154
CDs	27	CPI_comb	0.02089999999999998	Fund House_Sundaram Mutual Fund	0.0134

**4. Feature Importance keeping NAV growth as a target variable:**

<u>1. XGboost</u>		<u>2. Extra tree regressor</u>		<u>3. Random forest</u>	
Features	Importance (F-score)	Features	Importance	Features	Importance
Cotton Textiles	62	Fund House_ICICI Prudential Mutual Fund	0.5917	Fund House_ICICI Prudential Mutual Fund	0.5924000000000004
Basic Metal & Metal Product	62	Fund House_SBI Mutual Fund	0.38719999999999999	Fund House_SBI Mutual Fund	0.3874000000000002
Credits.Metropolitan.Accounts	57	Turnover_(Rs._Cr)	0.0104	Discrepancies	0.005000000000000001
CPI_industrial_food	40	Import of goods & Services	0.0016000000000000001	Fund House_Tata Mutual Fund	0.0030999999999999999
Credits.Rural.Amount	36	Fund House_UTI Mutual Fund	0.0012999999999999999	GBP	0.0028999999999999998
Consumption of Fixed Capital	28	GBP	0.0011000000000000001	GFCF	0.0015
CDs	28	Fund House_HDFC Mutual Fund	0.001	USD	0.0011000000000000001

# ANNEXURE

## Research

We started solving the problem statement by doing research on how NAV, AUM and other ratio/data impact MF and MF houses performances. By going through literature, we found which factors are economically significant for MF fund house performance.

Different statistical and financial tools have been used to evaluate the performance of Mutual Fund schemes under the present study. These tools and techniques include average return, standard deviation, coefficient of determination, beta and the measures suggested by Sharp Ratio, Treynor Ratio, Jensen Alpha, R-Square, Compound Annual Growth Rate – CAGR and Fama French Measure.

### **Paper 1**

#### **Statistical comparison of MF and BSE 100 Index**

**Overview:** To examine the performance, a sample of 5 schemes of UTI Mutual Fund have been selected on the basis of monthly returns and compared with benchmark (BSE National 100 Index) returns for the period from January 2007 to December 2015 (nine years) of transition economy.

**Conclusion Analysis :** From the above analysis, it can be concluded that out of the total 5 open-ended equity schemes of UTI Mutual Fund, 3 schemes namely, UTI Dividend Yield Fund Growth, UTI Equity Fund Growth and UTI Opportunities Fund Growth have performed better than the benchmark BSE National 100 in comparison of risk and return which indicates that the investors who have invested in these schemes to form well diversified portfolio would have received adequate returns per unit of the total risk & systematic risk undertaking

### **Paper 2**

#### **Performance Evaluation of Mutual Funds: An Analysis of Risk and Return**

**Basic Overview:** The paper examines the performance of selected mutual funds, predict the trends for investment of selected mutual funds for future and helps study the risk-return preference of investors.

**Conclusion :** the basic highlight is Important Research Methodologies to compare performance of various mutual funds and Estimation of future trends of mutual fund industry

### **Paper 3**

#### **Performance Evaluation of Open Ended Schemes of Mutual Funds**

**Basic Overview:** To examine the funds sensitivity to the market fluctuation in the terms of Beta and To appraise the performance of mutual funds with regard to risk-return adjustment, the model suggested by Sharp, Treynor and Jensen.

**Conclusion:** The analysis of the open ended schemes shows that out of twenty, five schemes namely Reliance Growth Fund, Reliance Vision Fund, ICICI Prudential Tax Plan, HDFC Top 200 and Birla Sun Life Equity Fund, performs better in comparison to benchmark index BSE-100 index in terms of monthly average return and risk involved in these schemes less than benchmark.

### **Paper 4**

### **Performance Analysis of Mutual Funds: Selected Reliance Mutual Fund Schemes**

**Basic Overview:** To evaluate the past performance of selected Open Ended Equity Mutual Fund schemes of Reliance and To carry out the risk return analysis of the sample funds selected.

**Conclusion:** Investors who wish to take a higher risk for higher returns can choose Reliance Banking Fund If the Investors is with a moderate risk profile and interested in normal / near to bench market returns can choose Reliance Small Cap Funds Similarly if the Investor is with a low risk profile and ready to accept normal returns can opt for tax saver ELSs

### **Paper 5**

#### **Performance Evaluation of Mutual Funds Schemes under Different Categories**

**Basic Overview:** Introduction to Process of Financial Evaluation, Financial and Statistical Tools of Measurement, and Techniques of Analysis and To evaluate the past performance of Mutual Fund Equity Schemes and the past performance of Schemes Under Categories Other than Equity

**Conclusion:** As standard deviation represents total risk (market risk, security specific risk and portfolio risk) involved in the mutual fund, fund with low standard deviation is preferred when the investor is more concerned about volatility of returns.

### **Paper 6**

#### **Performance Evaluation of Mutual Funds**

**Basic Overview:** The aim of conducting this research is to find out the investment tendency in mutual funds of Pakistan, Conventional Vs Islamic.

**Conclusion:** This paper provides an overview of the Pakistani mutual fund industry and investigates the mutual funds risk adjusted investment tendency using mutual fund performance evaluation models. Survivorship bias controlled data funds are used for the evaluation of investment tendency on mutual funds. Mutual funds industry in Pakistan is still in growing phase. Overall results suggest that mutual funds in Pakistan are able to add more value either Conventional or Islamic. Islamic mutual funds perform better results as compare to conventional but still conventional funds continuously doing well to enhance their investment with sustainable returns. Whereas results also show some of the funds underperform, these funds are facing the diversification problem.

### **Paper 7**

#### **Performance Evaluation of Mutual funds in India – A Comparative Study of Public and Private Sector Mutual Funds**

##### **Basic Overview**

The major objectives of the study are as follows:

- To find out the financial performance of Mutual Funds Scheme.
- To appraise the investment performance of mutual Funds with Risk adjustments the theoretical parameters as suggested by Sharpe, Treynor and Jensen.

**Conclusion** Private sector mutual fund schemes are performing better than Public sector mutual fund schemes. It shows that investment for longer period would get absolute higher return than the risk free rate of return. Magnum Midcap has highest beta means higher risk followed by Magnum Emerging Businesses and Canara Robeco Emerging Equities Fund. Franklin India Life Stage 20S Fund has lowest beta which can be a good investment option for risk averse investors. HDFC Growth Fund has highest Sharpe Ratio among Public and Private Sector Mutual Fund schemes.

### **Paper 8**



## **Performance Evaluation of selected open ended funds in India**

### **Basic Overview::**

- To examine comparative performance of selected open ended schemes and BSE-30 in terms of risk and return.
- To know whether the mutual funds are able to provide reward to variability and volatility.

**Conclusion:** In the end the study concludes that in 2009-10 except ING core equity fund and Kotak select focus fund all even schemes performed better than BSE-Sensex. Except one scheme all were able to provide reward for variability and volatility more than the benchmark. Four schemes have more risk than sensex. In the year 2010-11 benchmark has outperformed than all schemes. All schemes have failed to give more reward for variability than benchmark. Only four schemes were able to give reward for volatility than benchmark. So at the end we can see that HDFC top 200 Fund, HDFC capital builder fund and UTI opportunity funds were able to fulfill the expectations of the investors in terms of risk and return.

## **Paper 9**

### **A study on Performance Evaluation of Mutual Funds Schemes in India**

#### **Basic Overview**

- To evaluate the performance of selected open ended schemes on mutual funds in India.
- To measure the risk- return relationship and market volatility of the selected mutual funds.
- To examine the performance of selected schemes by using portfolio performance evaluation model namely Sharpe, Treynor

**Conclusion:** Results of the study showed that that 14 out of 30 sample mutual fund schemes had outperformed the benchmark return. All the schemes have represented positive returns. The results also showed that Reliance Regular Savings Fund Equity, SBI Contra Fund, HDFC Equity Fund of the schemes had underperformed, these schemes were facing the diversification problem. In the study, the Sharpe ratio was positive for all schemes which showed that funds were providing returns greater than risk free rate.

## **Paper 10**

### **Performance evaluation of mutual funds in India with special reference to selected financial intermediaries**

#### **Basic Overview**

- To investigate the financial performance of the mutual funds with the tools of return, standard deviation and beta.
- To evaluate the selected funds assessment on the basis of various performance ratios (Sharpe, Treynor, Jensen)
- To compare HDFC, Birla sun life and ICICI equity performance with the S&P CNX Nifty Index, to give rankings of mutual funds by their outstanding performance

**Conclusion:** The Mutual funds are one of the best investment source available for Indian small investors to make an investment, if thoroughly assessed it may give big returns with little savings. The above performance ratios are very much helpful for the evaluator to assess the fund's performance. As the Mutual Fund investment is subject to market conditions, therefore for the risk averse investors there are so many other investment alternatives available apart from the mutual funds, such as investment in other Financial Assets (stock market, debentures, Bonds, Treasury bills etc) and other Non Financial Assets (post office certificates, Bank deposits, Pension schemes, Real estate's) to avoid risk.

## **Paper 11**

## **Performance Evaluation of Mutual Funds**

**Basic Overview:** The objective of this paper is performance appraisal of mutual funds in India

**Conclusion:** The performance evaluation measures like standard deviation, beta, sharpe, Treynor and Jensen etc indicates that the performance of public sector schemes are comparatively better than that of private sector schemes. At the same time, short term schemes are facing high risk and high volatility where as long term schemes are consistent in giving returns to the investors.

### **Paper 12**

#### **Performance Evaluation of Indian Equity Mutual Funds against Established Benchmarks Index**

##### **Basic Overview**

The study has set the following specific objectives :

- To measure the return earned by the sample mutual funds schemes and compare against the benchmark market returns.
- To examine the degree of correlation that exists between fund and market return.
- To evaluate the performance of equity mutual fund scheme understand the impact of benchmark index on mutual fund performance.
- To find out the mutual fund schemes offering the advantages of diversification, along with adequate systematic risk compared to market beta risk.

**Conclusion:** The study conducts a comparative performance between equity mutual fund schemes and benchmark indexes over the five economic periods. It is observed that influence of market factor is closely affected behavior of mutual funds returns. The correlation is found between mutual funds and benchmark index returns are significantly high. These funds are also observed to have high R<sup>2</sup> values (Coefficient of Determination) indicating the better diversification of the fund portfolio. The beta coefficient in most of the sample schemes was lower than one indicates that these mutual funds followed defensive investment policy. The result shows that performance of the majority of sample mutual fund schemes are outperform the market benchmark indexes in term of Treynor and Sharpe ratio based on historical monthly returns. The reasons of outperformance of the funds that fund managers are efficient. They are diversifying the funds in different stocks which are generating higher returns. Fama's measure revealed that 70% of the mutual fund schemes have reported positive net selectivity indicating superior stock selection of the fund managers. Mutual fund managers also outperform the Market through their superior security selection and timing. The analysis shows that Indian Asset Management Company has been able to beat their benchmarks on the average.

### **Paper 13**

#### **Performance Evaluation of Indian Equity Mutual Funds against Established Benchmarks Index**

##### **Basic Overview**

- The study measures the return earned by the sample mutual funds schemes and compares them against the benchmark market returns.
- The paper examines the degree of correlation that exists between fund and market return.
- It evaluates the performance of equity mutual fund scheme and understands the impact of benchmark index on mutual fund performance.
- To find out the mutual fund schemes offering the advantages of diversification, along with adequate systematic risk compared to market beta risk.

##### **Conclusion**

- In this paper we did a regression based analysis of equity funds in India and analyzed their performance with respect to benchmark indexes.
- The study conducts a comparative performance between equity mutual fund schemes and benchmark indexes over the five economic periods
- The beta coefficient in most of the sample schemes was lower than one indicates that these mutual funds followed defensive investment policy.
- The result shows that performance of the majority of sample mutual fund schemes are outperform the market benchmark indexes in term of Treynor and Sharpe ratio based on historical monthly returns.

#### **Paper 14**

##### **Performance And Evaluation Of Mutual Fund In India**

###### **Basic Overview**

- The study examines the returns from 15 Mutual Funds
- It finds out the relationship between market return and scheme return
- It identify total and systematic risk

**Conclusion:** As per the performance the liquid funds have the overall highest return whereas if we consider the balanced fund, they give the least return. Also the large cap funds show the highest level, while the least level of correlation is Shown by the liquid funds. Throughout the study we observe that both the markets are highly correlated to each other. So the regression result of any particular scheme to a market is almost similar to the other market.

#### **Paper 15**

##### **‘A Comparative Study of Performance of Top 5 Mutual Funds in India’**

###### **Basic Overview**

- The study evaluates and compares the performance of equity diversified mutual fund schemes of selected companies
- It compares the performance of equity diversified mutual fund schemes of selected companies vis-à-vis the market.
- The paper studies changes in investment pattern

**Conclusion:** Local investors rushed to exit equity funds in January and shifted focus to debt in anticipation of a low interest rate regime in the coming quarters.

The rise in stock prices encouraged investors to book profits and shift money to debt schemes because the latter will generate healthy returns when interest rates soften, fund managers said. Clearly, investors are not convinced the stock market will continue to rise, with key indices touching a new high this year.

#### **Paper 16**

##### **Performance Evaluation of Open-Ended Equity Schemes of UTI Mutual Fund**

###### **Basic Overview**

- The study compares schemes return and risk with benchmark i.e. BSE National 100.
- It appraises the performance of Mutual Fund with regard to the risk-return adjustment, i.e., the model suggested by Sharp, Treynor and Jensen

**Conclusion:** From the above analysis, it can be concluded that out of the total 5 open-ended equity schemes of UTI Mutual Fund, 3 schemes namely, UTI Dividend Yield Fund Growth, UTI Equity Fund Growth and UTI Opportunities Fund Growth have performed better than the benchmark BSE National 100 in comparison of risk and return which indicates that the investors who have invested in these schemes to form well diversified portfolio would have received adequate returns per unit of the total risk & systematic risk undertaking.

### **Paper 17**

#### **Comparative Performance Evaluation of Open Ended Equity Mutual Fund Schemes: Indian Evidence**

**Basic Overview:** Small investors look at mutual funds as safest avenue to enter equity markets. They expect that the fund management with large Assets Under Management (AUM), professional managers, low transaction fees, access to information, and ability to forecast the markets will fetch them more returns than a naïve investment strategy. These expectations of small investors lead to large volumes of research on performance of mutual funds. This study tried to assess the performance of mutual fund schemes offered by a public sector undertaking in India. In all, eight open ended equity schemes were selected for the study. One year Net Asset Values (NAVs) of these schemes were used to measure the performance. We found that majority of the schemes have positive excess returns.

**Conclusion:** This study intended to evaluate the performance of open ended equity schemes offered by a public mutual fund trust in India. We found that, majority of the schemes had positive monthly returns and also positive risk adjusted returns. It is suggested that, the mutual fund trust should appoint different fund managers for different schemes. Next, the fund house should come up with a style investment fund for Banking. Finally, the fund managers should diversify the portfolio by reducing investments in banking stocks.

### **Paper 18**

#### **Analysis and performance of mutual funds companies in India**

**Basic Overview:** The research paper deals with the investment pattern of mutual fund investors. It deals with the objective and expectation of the mutual fund investors. It helps us know about the most favoured mutual fund company among investors. It helps us know about the most favoured mutual funds.

**Conclusion:** After research it is concluded that people want a handsome return along with security in a fund.

All in all the paper deals with dual analysis where on one side it deals with what an investor wants in a fund while on the other hand what successful funds have done for better future of their unit holders.

## Further Data Analysis for verification:

Peeyush's part

### Interpretation

Smart summary of the results and what do you understand by it

### Conclusion