Bank Stocks Analysis using R

Problem Statement

In India, the history of capital markets dates back to more than 130 years. The inception of capital markets in India was caused by the establishment of the Stock Exchange, Mumbai (Popularly known as BSE) in 1875. For more than 100 years of its inception, the capital market was considered as a place for elite group only. It was not seen as a factor, which can mobilize the saving into investment till recent decades. But, the increasing capital requirements of the economic system have induced common man to be aware of the development and working of capital markets. The common man is oblivious to the functioning of the sector therefore this project can be used by the common man through which they can get an idea of where to invest.

Objectives

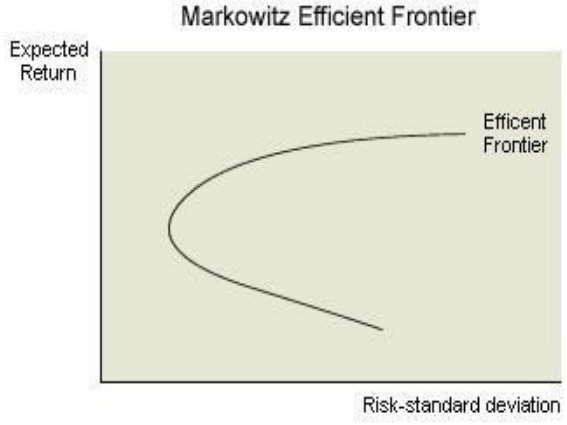
- To make comparative study of risk and returns of selected company stocks.
- To review the process of growth of capital markets, their evolving structure and their functioning through stock exchanges in India.

Background *(Exhaustive review is yet to be done)*

Markowitz Portfolio Theory:

Harry Markowitz developed this portfolio model in the year 1990. This model includes not only expected return, but also the level of risk for a particular return. Markowitz assumed the following about an individual's investment behavior:

- Given the same level of expected return, an investor will choose the investment with the lowest amount of risk.
- Investors measure risk in terms of an investment's variance or standard deviation.
- For each investment, the investor can quantify the investment's expected return and the probability of those returns over a specified time horizon.
- Investors seek to maximize their utility.
- Investors make decisions based on an investment's risk and return, therefore, an investor's utility curve is based on risk and return.



Methodology

Step 1:- Data Collection and Database Preparation

This step will involve collection of stock data of different banks belonging from the private as well as the public sector from Yahoo Finance.

Step 2:- Development of R model.

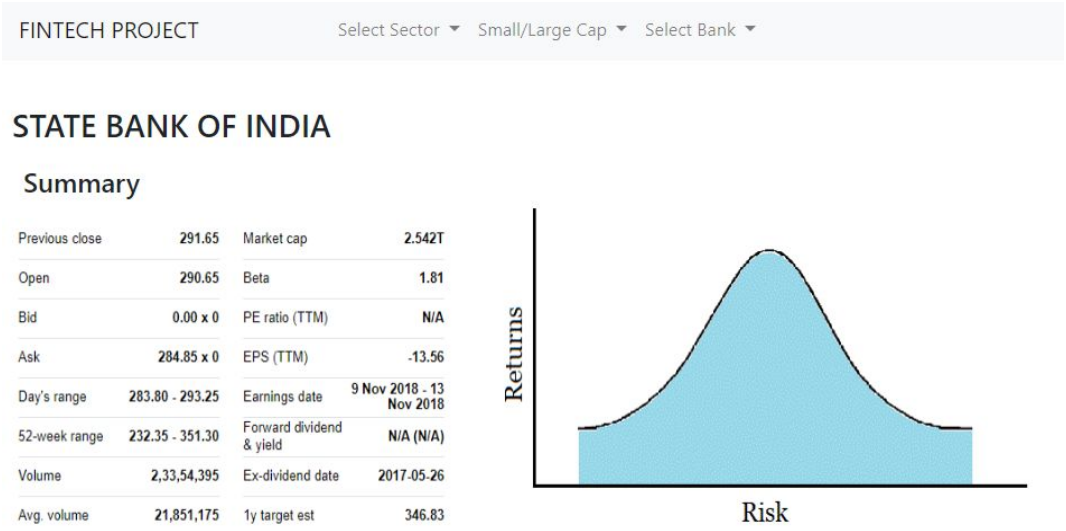
The R model is made using the 'lpSolve' package in R. The lpSolve package provides high-level functions for solving general linear/integer problems.

Step 3:- Integrating the database with R model

The data is fed into the model with some constraints. The lpSolve API takes into consideration these constraints such as average risk rate, maximum year, minimum returns, etc. and gives us the required output.

Step 4:- Deployment and analysis on real-life scenario

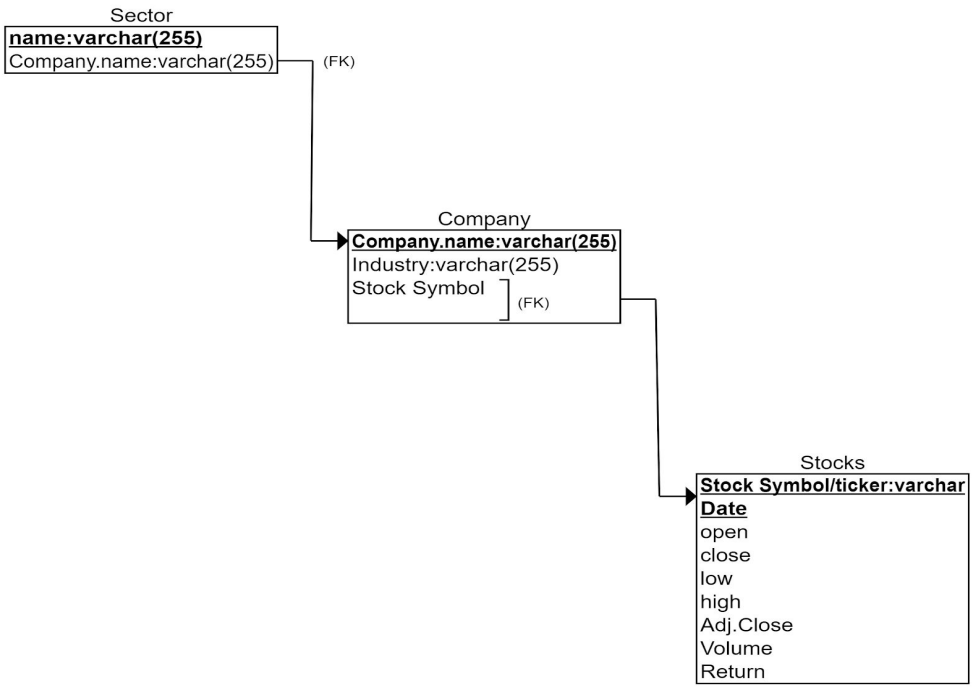
For Example, considering State Bank Of India we have created a dashboard containing the summary containing risk rate (Beta), market capital, etc. The Dashboard also shows the Returns vs Risk graph.



Experimental Design

Dataset

Dataset includes various NSE Sectors like Automotive, Banking/Finance, Engineering, etc. In those sectors, they are subdivided into large capital company and small capital company. Large capital and Small capital are further classified into Private Sector and Public Sector. We will be considering the Banking/ Finance sector. The data is collected from https://finance.yahoo.com/



ER Diagram

Evaluation Measures

The Evaluation Measure is the Returns vs Risk Graph.

Software and Hardware Requirements

Model creation and data visualization is done with R programming language using R Studio version 1.1.456. Database creation and Data Manipulation is done using MySQL.

References

1. "**A Study on Risk and Return Analysis of Selected Stocks in India**" by Dr. S. Krishnaprabha and Mr.M.Vijayakumar , IJSRM Volume 3 issue 4 April 2015.
2. **"Foundation of Portfolio Theory**" by Harry Markowitz, Baruch College, The City University of New York, New York, USA.
3. "**Portfolio selection**", Markowitz, H. M. (1952), The Journal of Finance, March.