

Financial Engineering Lab (MA374)

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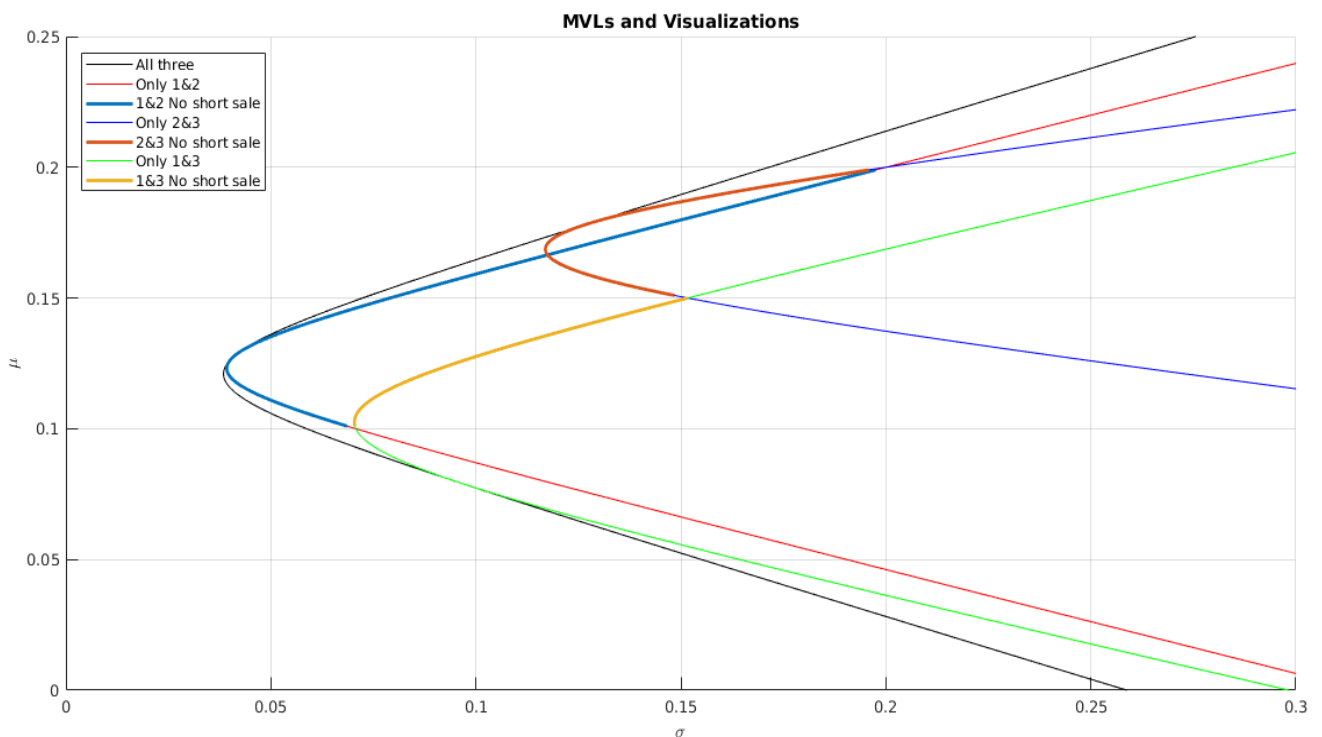
Assignment - 5
(14 February 2019)

◆ Question 1

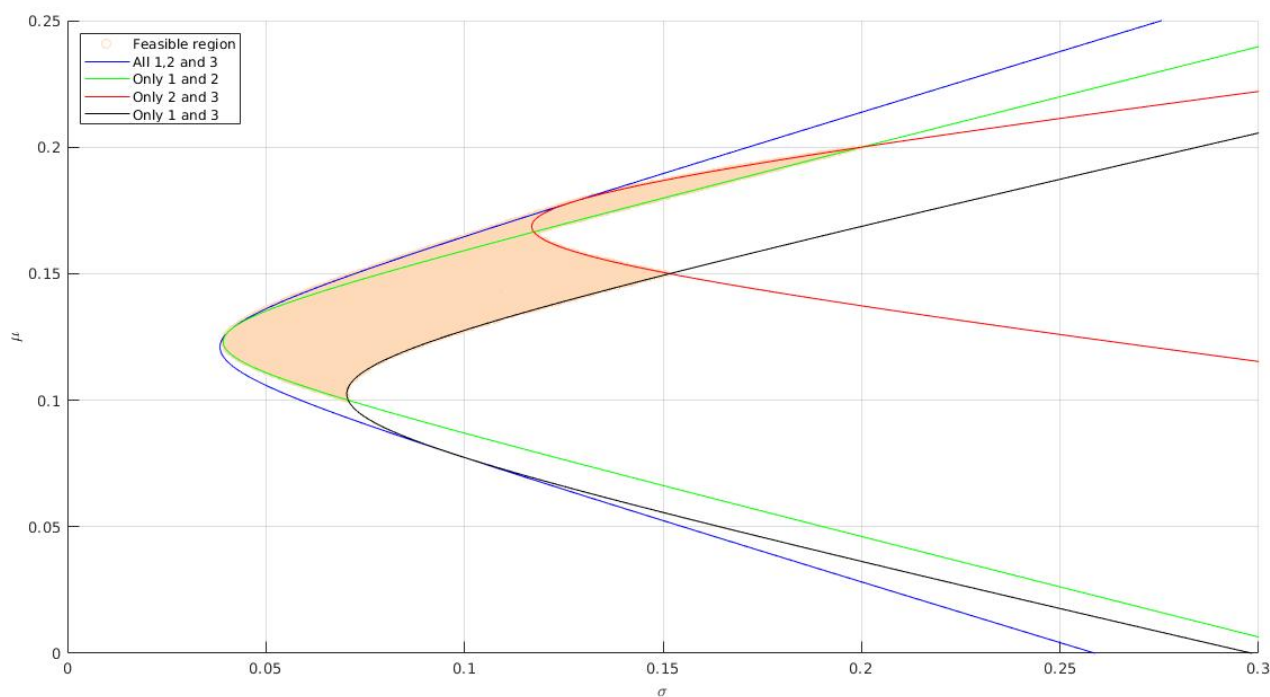
$$M = \begin{bmatrix} 0.1 & 0.2 & 0.15 \end{bmatrix}$$

$$C = \begin{bmatrix} 0.005 & -0.010 & 0.004 \\ -0.010 & 0.040 & -0.002 \\ 0.004 & -0.002 & 0.023 \end{bmatrix}$$

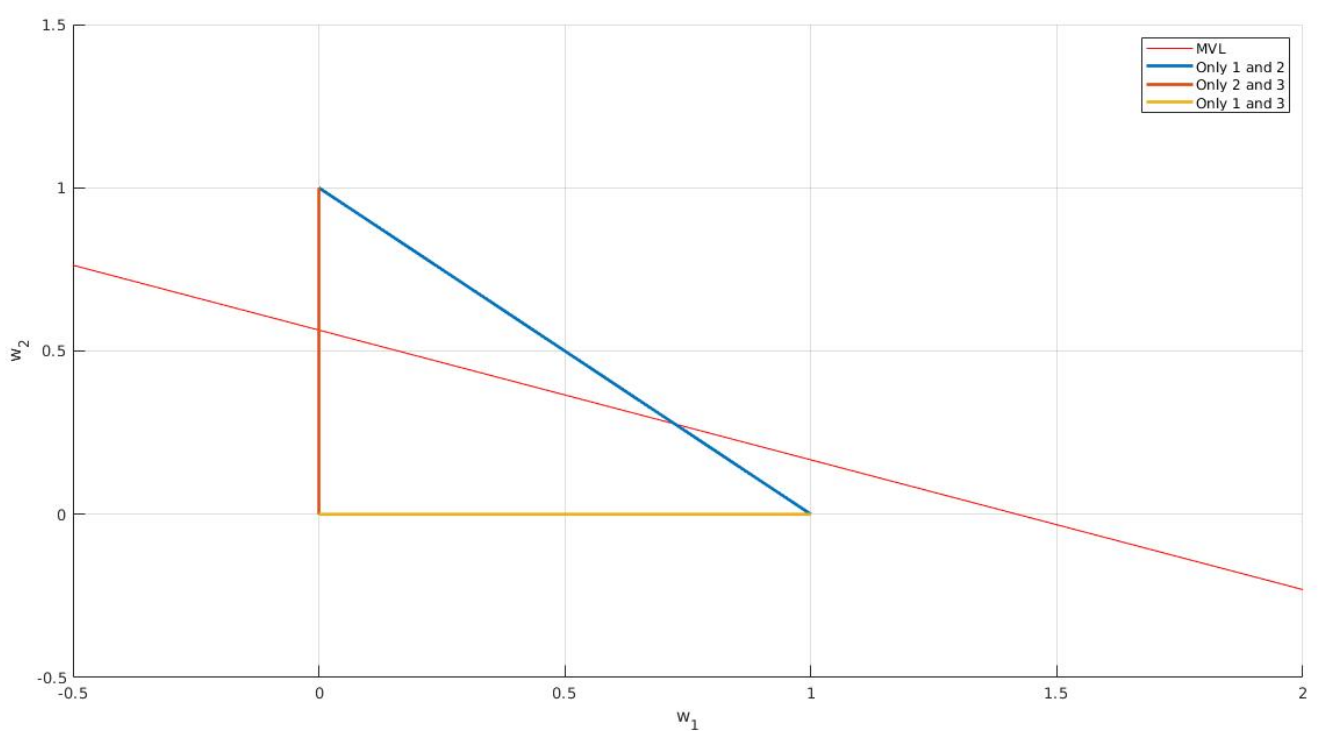
a) Markowitz Efficient Frontier and various MVLs -



b) Portoflios belonging to feasible region of MVL without short selling -



c) Weight Representations -



d) Weight Equations -

Let $W_1 = x$ (parameter) :

$$\begin{aligned}W_1 &= x \\W_2 &= -0.39744 * x + 0.56410 \\W_3 &= -0.60256 * x - 0.43590\end{aligned}$$

In terms of μ (return) = x (parameter) :

$$\begin{aligned}w_1 &= 2.5504 - 14.3119 * x \\w_2 &= 5.6880 * x - 0.4495 \\w_3 &= 8.6238 * x - 1.1009\end{aligned}$$

◆ Question 2

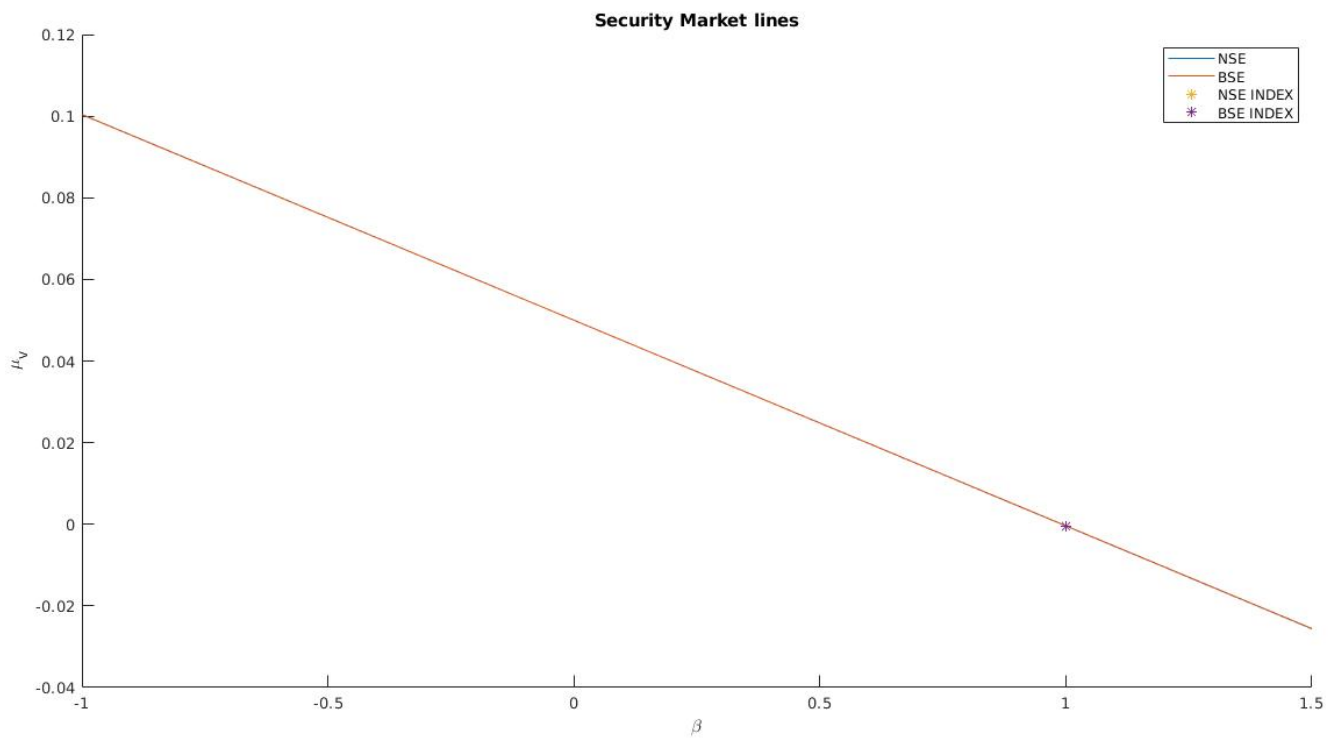
Assets from BSE (Sensex) :

Asset	Beta(Market: BSE(SENSEX))	Beta(Market: NSE(NIFTY))
Airtel	0.99627	0.98734
Asian Paints	0.85985	1.0059
Axis bank	0.93471	0.9379
Coal India	0.98392	0.98593
LT	0.9824	0.98236
Reliance	0.98579	0.99176
SBI	0.84954	0.85416
Tata Motors	0.99254	0.97481
Tata steel	0.99514	0.99045
Wipro	0.98052	0.97667

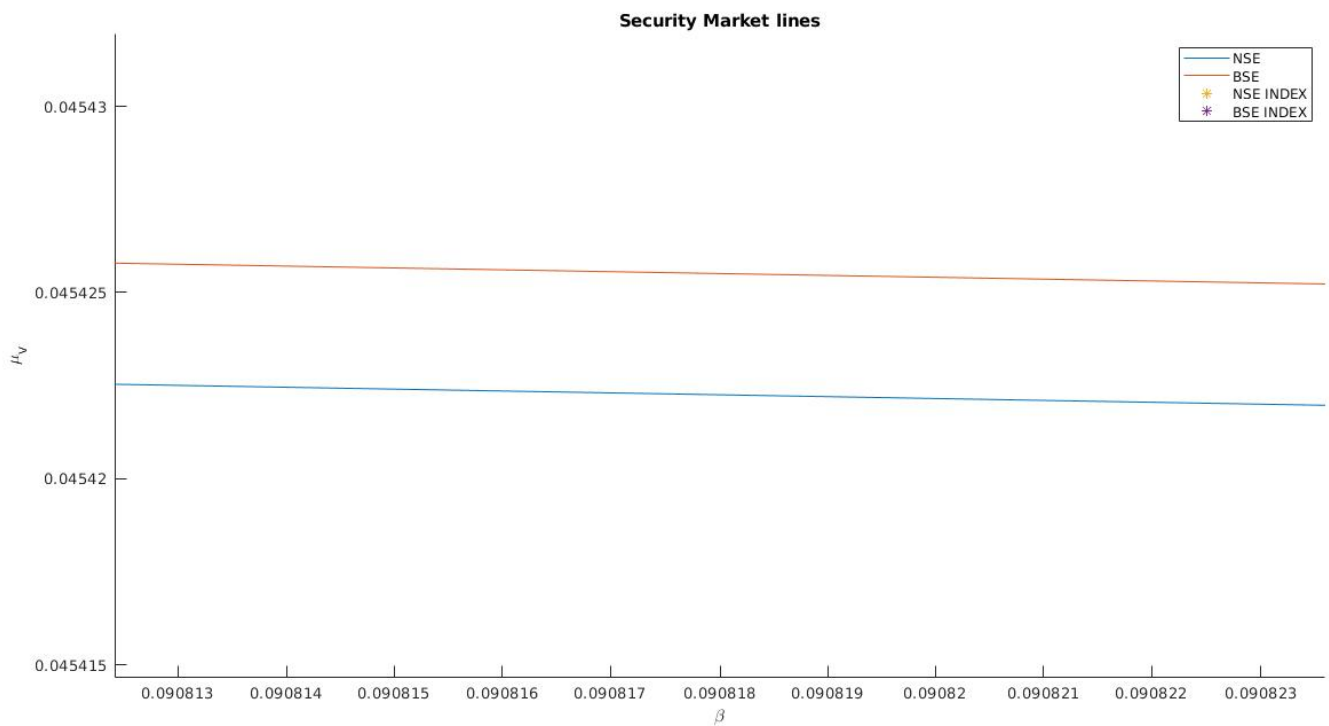
Assets from NSE (Nifty) :

Asset	Beta(Market: BSE(SENSEX))	Beta(Market: NSE(NIFTY))
BHEL	0.97963	0.97894
BOB	0.98395	0.98325
Britannia	1.005	1.0043
Colgate	0.98588	0.98518
Dabur	1.0051	1.0044
Godrej	0.99767	0.99696
Havells	0.96338	0.9627
MRF	1.0097	1.009
Oracle FS	0.99451	0.9938
Titan	1.0113	1.0106

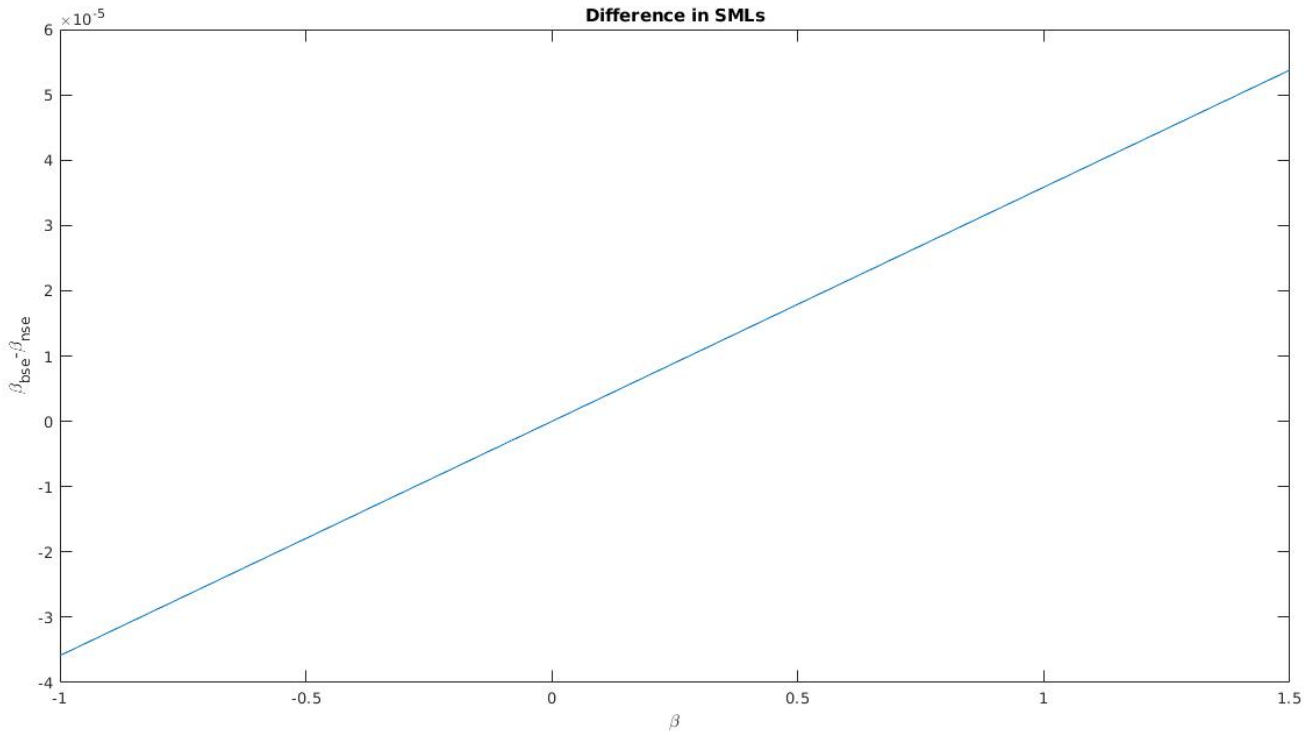
SML of both BSE and NSE will go downwards as the mean return of the market portfolio is less than the risk-free rate -



On Zooming --



Difference in SML is very less ---



The market portfolio has beta value exactly equal to 1.

- 1. If the beta value is less than one then it implies that the underlying asset has less volatility or the value of the underlying asset isn't highly correlated with the market value.**
- 2. Beta above one thereby implies high volatility or high correlation with the market movements.**
- 3. Beta less than one can occur when the asset price goes opposite to the market.**