Asset Pricing 2 (Nasruddin)

Market Model

Estimate the intercept coefficient (α) and slope coefficient (β) for each of the ten industry portfolio using the market model: regress the monthly *excess* returns for each industry portfolio on the monthly *excess* returns for the market portfolio.

Create a table showing the intercept and slope coefficients for the ten industry portfolios.

	Industry	Alpha	Beta
0	NoDur	0.369443	0.652647
1	Durbl	-0.415599	1.648536
2	Manuf	0.159771	1.169846
3	Enrgy	0.501719	0.969850
4	HiTec	-0.064020	1.132969
5	Telcm	0.194691	0.900729
6	Shops	0.275492	0.826492
7	Hlth	0.237841	0.673036
8	Utils	0.444585	0.538086
9	Other	-0.387135	1.207309

Briefly explain (in words, without mathematical equations or formulas) the economic significance and pricing implications of the intercept and slope coefficients.

The alpha, which represents the intercept coefficient, reflects how much a portfolio outperforms market expectations, if the slope is positive. It also reflects how much it underperforms, when the slope is negative, relative to market expectations, capturing excess returns. The beta, which represents the slope, measures the portfolio's sensitivity to systemic risk of the market. A higher beta means more volatility, while a positive alpha indicates better-than-expected returns given the portfolio's risk level.

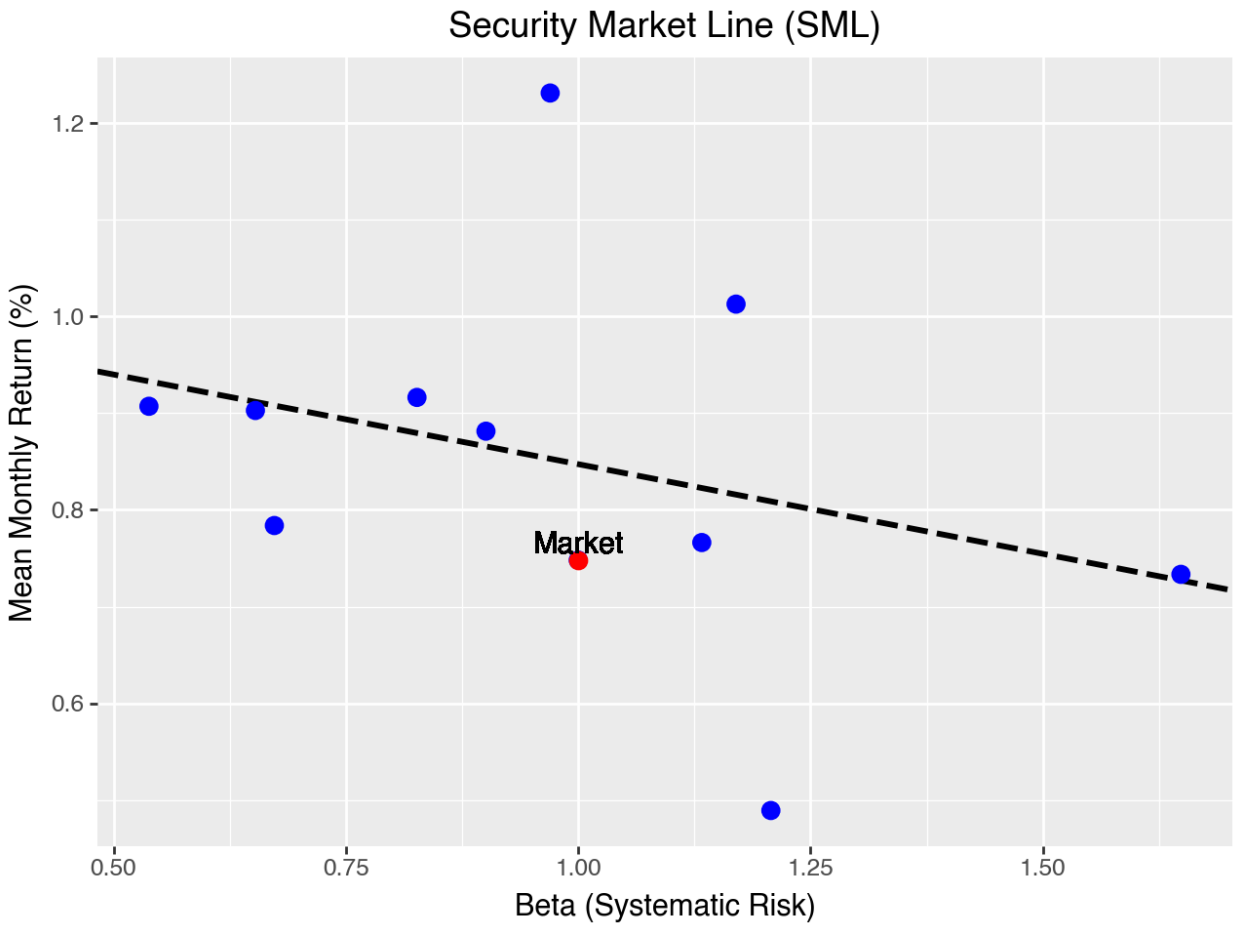
Security Market Line (SML)

Calculate the mean monthly return for each of the ten industry portfolios, as well as the market portfolio.

	Industry	Beta	Mean_mth_Return
0	NoDur	0.652647	0.902833
1	Durbl	1.648536	0.733333
2	Manuf	1.169846	1.012833
3	Enrgy	0.969850	1.231167
4	HiTec	1.132969	0.766250
5	Telcm	0.900729	0.881417
6	Shops	0.826492	0.916333
7	Hlth	0.673036	0.783833
8	Utils	0.538086	0.907167
9	Other	1.207309	0.489083
10	Market	1.000000	0.748083

Regress the mean monthly returns of the ten industry portfolios and the market portfolio on the corresponding β's. This will give you the intercept and slope coefficients for the SML. (Note that the results may be very different from what you would expect!)

Use the estimated intercept and slope coefficients for the SML to plot the SML in the range of β from zero to two on the horizontal axis.



OLS Regression Results

Dep. Variable:	Mean_mth_Return	R-squared:	0.097
Model:	OLS	Adj. R-squared:	-0.003
Method:	Least Squares	F-statistic:	0.9679
Date:	Sun, 29 Sep 2024	Prob (F-statistic):	0.351
Time:	22:03:01	Log-Likelihood:	3.9339
No. Observations:	11	AIC:	-3.868
Df Residuals:	9	BIC:	-3.072
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	1.0328	0.192	5.374	0.000	0.598	1.468
Beta	-0.1855	0.189	-0.984	0.351	-0.612	0.241

Omnibus:	2.793	Durbin-Watson:	1.380
Prob(Omnibus):	0.247	Jarque-Bera (JB):	0.623
Skew:	0.489	Prob(JB):	0.732
Kurtosis:	3.635	Cond. No.	6.67

Briefly explain the economic significance and pricing implications of the SML.

The Security Market Line, SML, shows the tradeoff between systemic risk and expected return, indicating that assets with higher systematic risk, which is beta, should offer higher expected returns. Economically, it reflects market equilibrium where investors are compensated for taking on more risk. Assets above the SML are undervalued, offering returns greater than their risk, while assets below are overvalued, providing inadequate returns for their risk level. Overvalued assets are likely to be sold, pushing their prices down towards the mean, whereas undervalued assets may attract buyers, which, in turn, drives their prices up.