

Asset Pricing: Assignment 3

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1 CAPM

Bellow, we have the mean excess returns for the first subsample (7/26 - 12/63) scaled by 100

<i>SL</i>	<i>SH</i>	<i>BL</i>	<i>BH</i>	<i>Mrk</i>
0.94	1.43	0.84	1.23	0.86

and similarly we have the covariance matrix for the same subsample scaled by 1000

<i>SL</i>	<i>SH</i>	<i>BL</i>	<i>BH</i>	<i>Mrk</i>
71.0	86.0	46.0	72.0	50.0
86.0	117.0	56.0	97.0	63.0
46.0	56.0	38.0	52.0	39.0
72.0	97.0	52.0	91.0	58.0
50.0	63.0	39.0	58.0	42.0

The dotted line represents the efficient set when there exist a risk free asset and the solid blue line represens the efficient frontier where there is no riskfree asset.

The Sharpe ration of the Tangent Portfolio and the Market Porfolio are 9.600 and 6.345, respectively. Then, we calculate the portfolios betas and alpha values. Bellow we show the alphas scaled my 100 (multiplied by 100).

<i>SL</i>	<i>SH</i>	<i>BL</i>	<i>BH</i>
0.08	0.57	-0.03	0.37

We plot the regression of the alpha values

We also performed a GRS test to test weather all alpha values equal to zero. We got and F value of 4.0995 and a p-value of 0.00283762. Thus, we do not reject our hypothesis.

Now we repeat the above analysis with the second subsample. Here are the means scaled by 100

<i>SL</i>	<i>SH</i>	<i>BL</i>	<i>BH</i>	<i>Mrk</i>
0.5	0.99	0.47	0.67	0.49

and the covariance matrix both scaled by 10000

<i>SL</i>	<i>SH</i>	<i>BL</i>	<i>BH</i>	<i>Mrk</i>
47.0	34.0	26.0	24.0	26.0
34.0	31.0	19.0	23.0	21.0
26.0	19.0	21.0	18.0	20.0
24.0	23.0	18.0	23.0	19.0
26.0	21.0	20.0	19.0	20.0

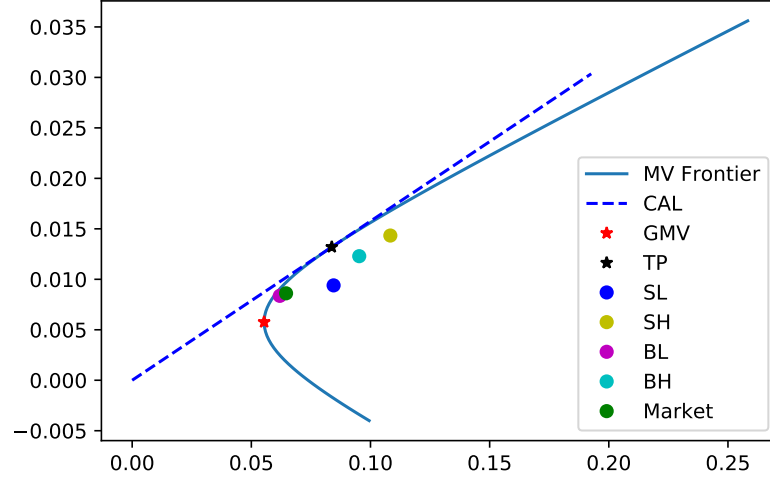


Figure 1: Mean Variance Frontier

We calculate the Mean Variance frontier with this new subsample and we as well plot it. The Sharpe ratios for the market and tangente are 3.491 and 5.074

<i>SL</i>	<i>SH</i>	<i>BL</i>	<i>BH</i>
0.0	0.5	-0.02	0.18

Now we plot the regression line for the alpha values. We can clearly see that the point do not follow the dotted line.

As before we run a GRS test. We got an F value of 0.14890967 and a p-value of 0.9634732. Therefore we reject the null hypothesis of all alphas equal zero.

2 small HML

2.1 (i)

Here, we plot the two subsamples, the orange line corresponds to 1/94 $\hat{\alpha}$ 6/16 and the blue to 1/64 $\hat{\alpha}$ 12/93. We can clearly see that the orange line as a negative trend were the blue line has a spike rather than a trend.

2.2 (ii)

Bellow, the mean, standard deviation and the Sharpe ratio for the two subsamples.

<i>Mean</i>	<i>Std</i>	<i>SR</i>
1.1	285.47	0.0

<i>Mean</i>	<i>Std</i>	<i>SR</i>
21.59	361.08	0.06

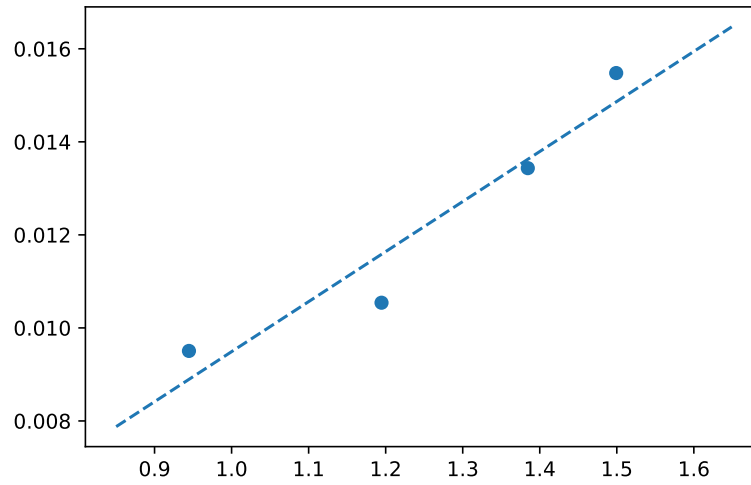


Figure 2: Regression of Alphas

2.3 (iii)

Here we plot the autocorrelation function of the aggregate small HML up to lag 12 quarters for the two subsamples.

2.4 (iv)

Since no autocorrelation is significant at any lag we conclude that the excess return from momentum and reversal is statistically inexistent.

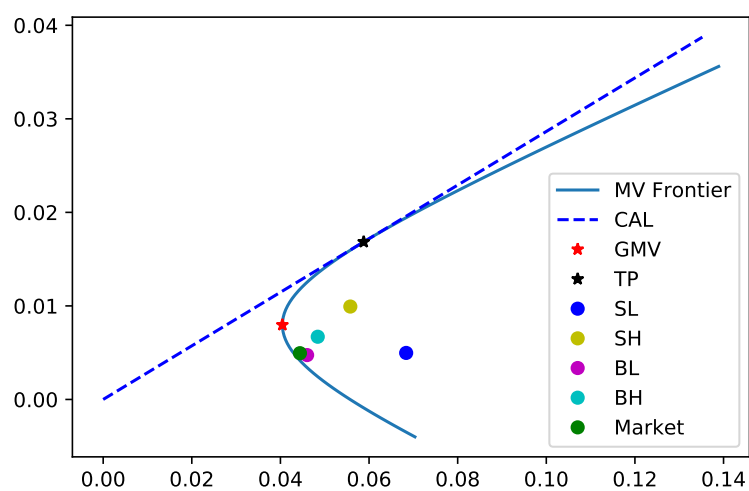


Figure 3: Mean Variance Frontier

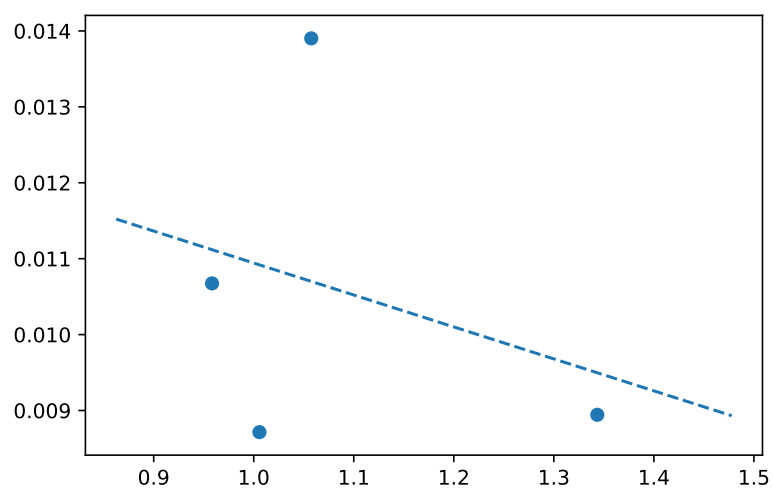


Figure 4:

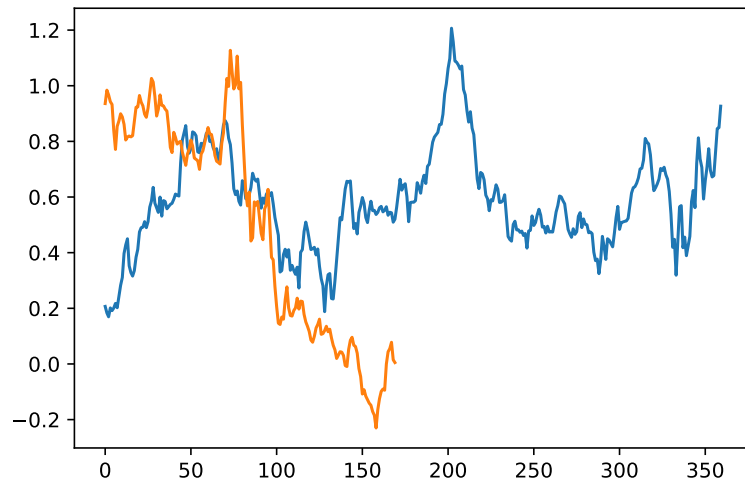


Figure 5: small HML 1/94 - 6/16 (orange) and the blue to 1/64 - 12/93 (blue)

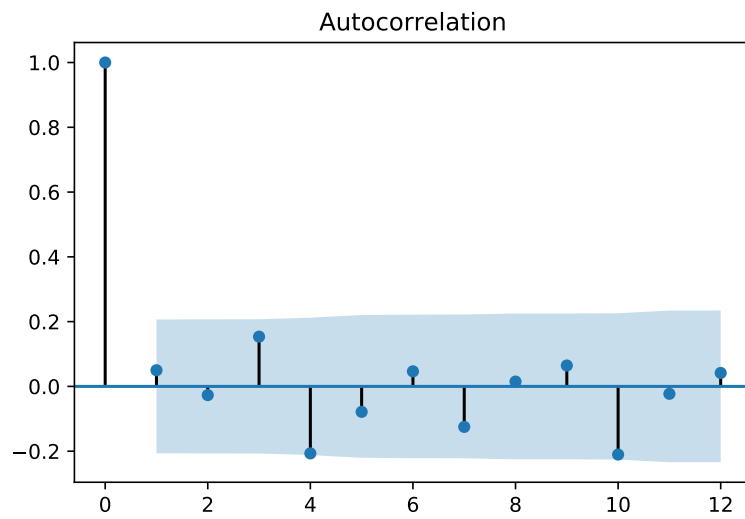


Figure 6: small HML 1/64 - 12/93

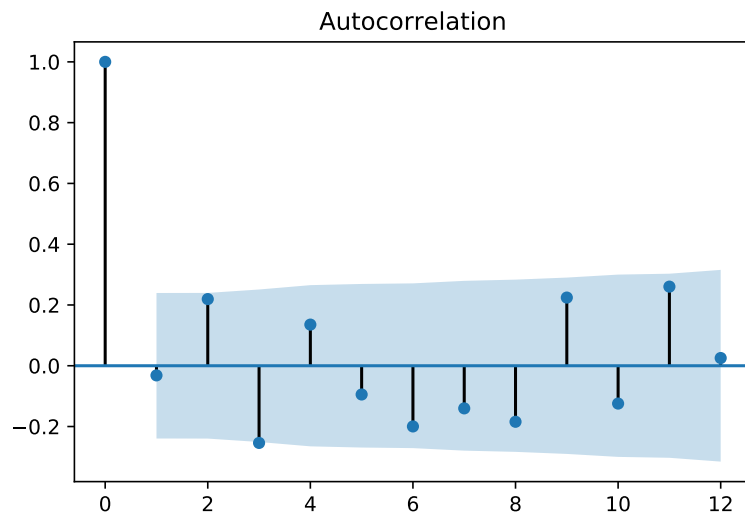


Figure 7: small HML $1/94 \hat{\sim} 6/16$