Stuart School of Business
ILLINOIS INSTITUTE OF TECHNOLOGY

VPM (MSF 504)
Homework 3

Names: Benjamin Scialom, Ruba Hakeem, Abeer Faisal, and Michael Kralis

Analysis:

1. Are any of the factor returns from Step 3 significantly different from zero?

	Factor returns						
	RmktRf	**RmktEI**	**Rsmb**	**RsmbEI**	**Rhml**	**RhmlEI**	**Const**
Average factor return	0.0090	1.9419	0.2409	-1.4445	0.3276	-0.6248	0.5089
Standard error factor return	0.2794	0.7298	0.1231	0.3887	0.1136	0.3191	0.2219
t-stat factor return	0.0321	2.6608	1.9563	-3.7163	2.8845	-1.9583	2.2933

- γ_0 = Const = 0.5089% and the associated t-stat is 2.29
- γ_2 = RmktEI = 1.9419% and the associated t-stat is 2.66
- γ_3 = Rsmb = 0.2409% and the associated t-stat is 1.96
- γ_4 = RsmbEI = -1.4445% and the associated t-stat is -3.72
- γ_5 = Rhml = 0.3276% and the associated t-stat is 2.88
- γ_6 = RhmlEI = -0.6248% and the associated t-stat is -1.96

We cannot consider the RmktRf factor as significant since the average factor return is very close to zero and the t-stat equal to 0.03 shows that the result is not relevant enough.

2. Do the signs of the coefficients (plus or minus) make economic sense? Explain.

First of all, the average factor returns of HML and SMB are both positives which match with what we have seen in class. It means that small capital stocks perform better than large stocks on average and that value stock perform better than growth stocks.

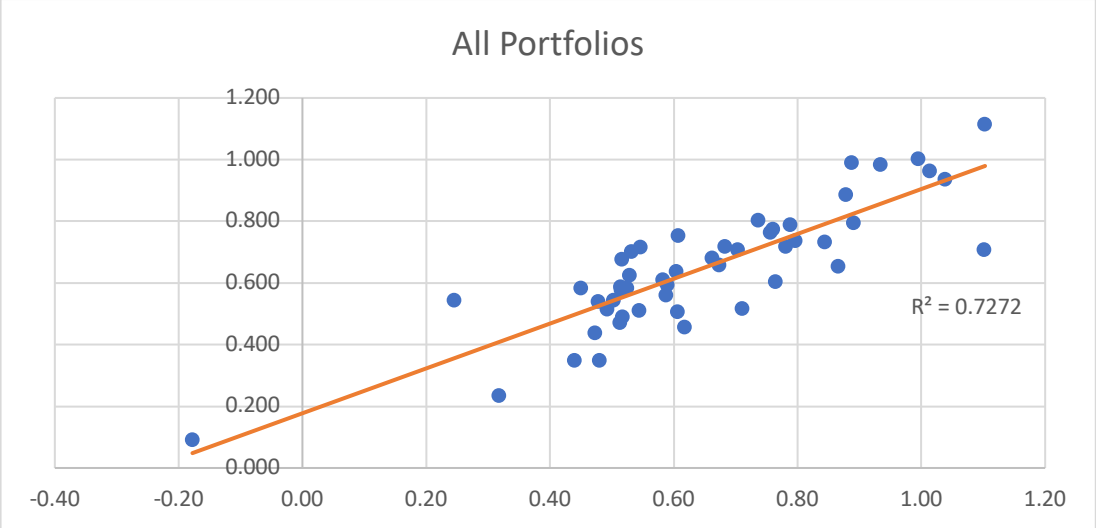
As regards to the factor returns associated to employment index (RmktEI, RsmbEI and RhmlEI), the interpretation is different and pretty much related to the employment index given in the subject.
The positive value on the MktEI factor means that when it is a bad time ($EI_{t-1}$is negative), stocks with negative betas have higher market return and exposure during poor employment periods. This is quite surprising.
The positive value on the SmbEI factor means that when it is a bad time ($EI_{t-1}$is negative), stocks with a negative beta to SmbEI have greater returns and exposure to SMB during poor employment periods.
The negative value on HmlEI factor means that when it is a bad time ($EI_{t-1}$is negative), stocks with a negative beta to HmlEI have greater returns and exposure to HML in periods of poor employment states.

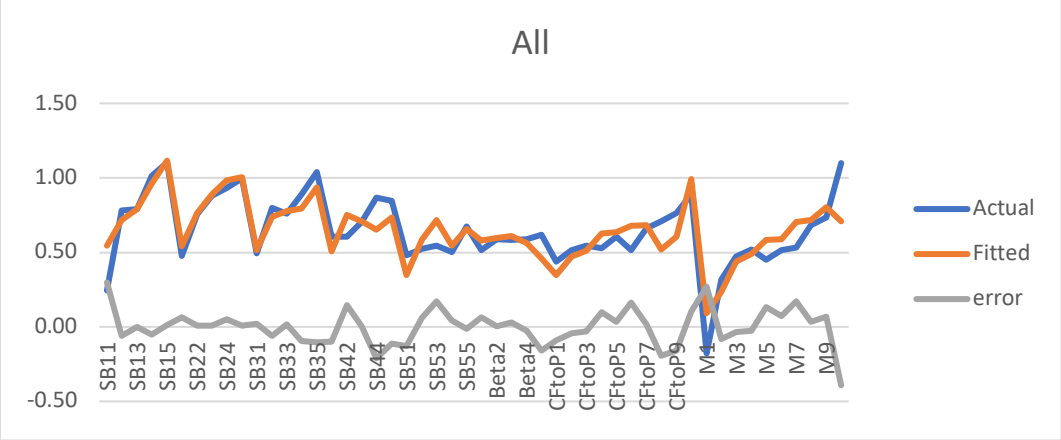
Finally, the Rmkt average factor return is very close to zero and have a very low t-stat. According to the CAPM theory, the expected return on asset over risk-free is proportional to the market risk premium and higher with lower exposure. I would say that I was just expecting a higher return, but the sign is not a surprise and matches the theory.

3. Estimate the quasi-R^2 of the model.

	Quasi R-Squared
Size and Book-to-market portfolios (25)	75.772%
Portfolios on market betas (5)	-410.159%
Portfolios on cashflow-to-price ratios (10)	29.855%
Momentum Portfolios (10)	69.493%
All	72.720%
Betas and cashflow-to-price portfolios	17.61%

4. How well does this model fit the data? Explain.





From a general point of view, we can say that the model fit pretty well the actual data. However, the value of the R-squared for the portfolios formed on betas is quite important. It means that the model fit quite badly the reality for these portfolios. However, the model is very bad at fitting the betas and cash-to-price portfolios.