FINC 688 Empirical Asset Pricing- Homework 2

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Exercise 1: Data

Present summary statistics and check if they are the same

Percentile	Nobs	Mean	Std	Rho1
1	36	-2.17	7.51	0.3
5	145	-0.53	5.99	0.18
10	181	-0.06	5.64	0.17
25	543	0.2	5.56	0.17
50	905	0.48	5.33	0.14
75	904	0.77	5.41	0.08
90	543	1.02	5.52	0.03
95	181	1.28	5.59	-0.02
99	36	2.66	6.43	-0.11

The magnitudes and autocorrelations are similar to the tabulated results presented in the homework, however, the returns are decreasing as percentile increases. The given results have much fewer observations, which may explain the difference.

Exercise 2: Bootstrap simulations

Estimate alpha and its t-ratio for each fund and fill the first two columns of Table 2, where Alpha is in percentage per month, and t-ratio is calculated based on the White (1980) standard errors. Then, apply the same bootstrap approach in Kowsowski et al. (JF 2006) for alpha t-ratios to fill the remaining three columns of the Table. The table format is similar to Table III of Fama and French (JF 2010). Use 1,000 simulation runs. Also, briefly describe the procedure of your bootstrap analysis (e.g., each of the steps in your exercise).

The mutual fund application of boostrap methods is an interesting application as the lage cross section makes it problematic to draw inferences and summary statistics. Im the Kowsowski et al. (2006) methology we first estimate for each mutual fund in the sample the factor model regression

$$r_{it} = \alpha_i + \beta_i r_{mt} + c_i SMB_t + d_i HML_t + \varepsilon_{it} \tag{2.1}$$

r_{mt}: excess return on stock market index. SMB, HML are the long short portfolio on market capitalization, book/market ratios α is the time invariant intercept for each fund. For each

mutual in the universe we keep the estimates of $\alpha_i, \beta_i, c_i, d_i$. In addition, we keep the residual term for each mutual fund. We run 1000 simulations where for each fund i we draw a ε_{it} with randomly replacement. The resampled residual is added to the coefficients without the intercept. Then the t-stats and alphas are calculated and then tabulated to form a distribution for each fund.

Percentile	Nobs	Alpha	t-stat	Sim-Alpha	% >1.96
1.0000	36.0000	-0.0160	-2.9754	-0.0159	0.0009
5.0000	145.0000	-0.0073	-2.6984	-0.0073	0.0004
10.0000	180.0000	-0.0049	-2.4563	-0.0049	0.0010
25.0000	542.0000	-0.0031	-1.9344	-0.0031	0.0012
50.0000	903.0000	-0.0016	-1.2205	-0.0016	0.0036
75.0000	902.0000	-0.0004	-0.3554	-0.0004	0.0184
90.0000	542.0000	0.0009	0.5993	0.0009	0.1143
95.0000	180.0000	0.0021	1.2160	0.0021	0.2701
99.0000	36.0000	0.0097	2.0685	0.0097	0.6103

It appears that the alpha and t-stat increases monotonically with percentile. The top percentile has on average significant alpha and over 60 percent of the tstat values greater than 1.96.

Exercise 3: Portfolio Sorting Based on R Squared

Similar to Panel A, Table 2in Amihud and Goyenko (RFS, 2013, p. 673), perform an analysis of the fund sample. Here, continue to use the factor model to estimate R2 for each fund. Use a rolling window of 24 months to estimate R^2.

				R2				
	Row	1	2	3	4	5	All	HIGH-LOW
	1	0.299	0.27504	0.27572	0.29741	0.40185	0.309804	0.012342
	2	0.27793	0.2726	0.29122	0.27558	0.4075	0.304966	0.015548
Alpha	3	0.33464	0.33355	0.32246	0.35791	0.50784	0.37128	0.020784
	4	0.32005	0.34328	0.3895	0.4331	0.46763	0.390712	0.017709
	5	0.25159	0.40297	0.40645	0.35749	0.48734	0.381168	0.028289
	All	0.296642	0.325488	0.33707	0.344298	0.454432	0.351586	
	HIGH-LOW	-0.005689	0.015353	0.015687	0.00721	0.010258		

Mean returns appear to generally increase with alpha and r2. I would assume that if we require funds to have a defined style and a name in the CRSP database, have TNA 15 million, and invest at least 70 percent of their assets in common stocks we would have results similar to the paper. We have more observations relative to what were used in the paper. Note the output is monthly excess return.

Exercise 4: Fama-MacBeth Regressions

Use the Fama-MacBeth (1973) method to examine whether(1) R2and (2) exposure to a liquidity risk factor are related to one-month-ahead fund return in the cross-section.

Part A- Intercept	-0.25
Part A- R2	-0.39
Part A- Intercept t-stat	1.59
Part A- R2 t-stat	0.28
Part B- Intercept	-0.27
Part B- Liq Beta	0.10
Part B- Intercept t-stat	1.31
Part B- Liq Beta t-stat	-0.10
Part C- Intercept	-0.25
Part C- R2	-0.40
Part C- Liq Beta	0.13
Part C- Intercept t-stat	1.54
Part C- R2 t-stat	0.38
Part C- Liq Beta t-stat	-0.08

These are the averaged results from the rolling 24-month regression. For individual outputs at each point in time please see the .csv with *_all* in the data folder. From the t-stats of the cross-sectional regression, it appears that the liquidity measure and the previous period's liquidity betas are not significantly related to one-month-ahead fund return in the cross-section.

5 References

Amihud, Y. and R. Goyenko, 2013, Mutual fund R2as a predictor of performance, Review of Financial Studies26, 667-694.

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Kosowski, R., A.Timmerman, H. White and R. Wermers, 2006, Can mutual fund "stars" really pick stocks? Evidence from a Bootstrap Analysis, Journal of Finance61, 2551-2569.

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