FIN3080 HW2 Report

Things to know:

Table 2 and *Table 3* in this report refers to the Table 2 and Table 3 from Section 4 in Chen et al. (2019)

Problem 1:

(a)

See the details in the code HW3_P1

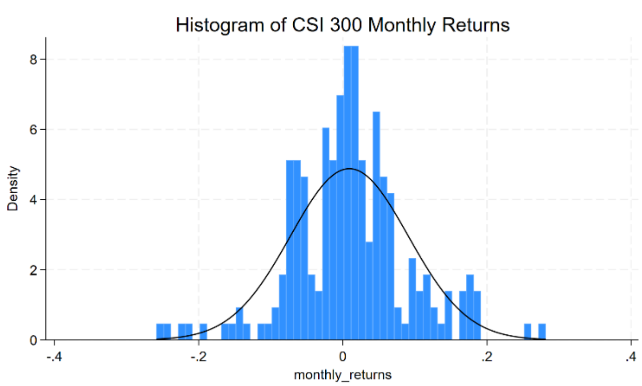
monthly_returns

	Percentiles	Smallest		
1%	-.2269278	-.2585052		
5%	-.1179456	-.2421533		
10%	-.0762293	-.2269278	Obs	215
25%	-.04172	-.2103763	Sum of wgt.	215
50%	.0059823		Mean	.0090424
		Largest	Std. dev.	.081745
75%	.0505247	.1874761		
90%	.1182579	.1905605	Variance	.0066822
95%	.1686821	.258075	Skewness	.0183077
99%	.1905605	.2792902	Kurtosis	4.393663

Mean: 0.0090424 Standard deviation: 0.081745

Skewness: 0.0183077 Kurtosis: 4.393663

(b)



(c)

Skewness and kurtosis tests for normality

Variable	Obs	Pr(skewness)	Pr(kurtosis)	Joint test Adj chi2(2)	Joint test Prob>chi2
monthly_returns	**215**	**0.9099**	**0.0029**	**8.16**	**0.0169**

By skewness and kurtosis tests for normality, the returns for *CSI 300* index do not follow the normal distribution. Though Probability (skewness) = 0.9099 shows that the distribution is symmetric, Probability (kurtosis) = 0.0029 shows that there are fat tails compared with normal distribution. In addition, the joint test tells us that we should reject the null hypothesis at the 5% level (the null hypothesis: the distribution is normal).

Problem 2:

(a) – (c)

See the details in the code HW3_P2

(d)

Repeat the steps to derive a table similar to *Table 2.*

After data processing, we get a dataset containing weekly individual stock returns, risk-free rate, and market returns. First, we split the data into 3 periods, that is, T1, T2, T3, respectively. Then, in T1, we conduct the stock-level time-series regressions for each stock to derive β_i. Based on the β_is, in T2, we construct ten portfolios and calculate their returns respectively. Finally, we conduct portfolio-level time-series regressions to derive β_ps, and have the following table which shows similar results to those in *Table 2*.

Portfolio index	α	β_p	R^2	Number of observations
1	-0.0013981 (0.0000466)	0.771439 (0.0014815)	0.916254	24800
2	-0.0000246 (0.0000385)	0.8700057 (0.0012221)	0.953302	24800
3	-0.0001226 (0.0000288)	0.9031776 (0.000915)	0.975287	24700
4	0.0007093 (0.0000283)	0.9331025 (0.0008985)	0.977565	24800
5	-0.0002562 (0.0000262)	1.001072 (0.0008323)	0.983148	24800
6	0.0000203 (0.0000244)	1.036387 (0.0007754)	0.986350	24700
7	-0.0004045 (0.0000294)	1.040984 (0.0009357)	0.980342	24800
8	-0.000263 (0.0000313)	1.091806 (0.0009945)	0.979912	24700
9	0.0000116 (0.0000371)	1.13304 (0.0011778)	0.973982	24700
10	-0.0009068 (0.0000403)	1.147213 (0.001279)	0.970169	24700

Based on the β_is, in T3, we construct ten portfolios and calculate their returns respectively. Then, we regress the portfolio returns on β_ps from T2 to get the table 3, which shows similar results to those in *Table 3*.

	γ_0	γ_1	R^2	F-statistics	P-value
coefficient	-0.0015157	0.0030818	0.5537	9.93	0.0136
t-value	-1.55	3.15			

Source	SS	df	MS			
				Number of obs	=	10
				F(1, 8)	=	9.93
Model	1.2658e-06	1	1.2658e-06	Prob > F	=	0.0136
Residual	1.0201e-06	8	1.2751e-07	R-squared	=	0.5537
				Adj R-squared	=	0.4980
Total	2.2859e-06	9	2.5399e-07	Root MSE	=	.00036

portfolio_~s	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
beta_p	.0030818	.0009781	3.15	0.014	.0008263	.0053374
_cons	-.0015157	.0009777	-1.55	0.160	-.0037701	.0007388