Quantitative Asset Management | MGMTMFE 431 | Spring 2019

Problem Set 1: Market Portfolio

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1. Construct the value-weighted market return using CRSP data,1 replicating the market return time series available in Kenneth French website.2 Also calculate the equal-weighted market return, and the lagged total market capitalization. Your output should be from January 1926 to December 2018, at a monthly frequency.

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library(knitr)
kable(head(CRSP_M), caption="Return Table", digits=8)
```

Table 1: Return Table

Year	Month	Stock_lag_MV	Stock_EW_Ret	Stock_Vw_Ret
1926	1	26903.95	0.02340505	0.00024718
1926	2	27032.35	-0.05372756	-0.03397602
1926	3	26162.08	-0.09710990	-0.06487498
1926	4	24506.93	0.03160938	0.03669461
1926	5	25274.39	0.00209402	0.01225953
1926	6	25609.11	0.04934783	0.05441060

2. Using the risk-free rate of return from French's website, report the following moments of the market excess returns for both time series (4 decimal digits): annualized return, annualized volatility, annualized Sharpe ratio, skewness, and excess kurtosis. You should be comparing between July 1926 to December 2018, at a monthly frequency.

Table: Moments Matrix

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Estimated
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FF Market E	xcess Return Actual FF Market Exce	ss Return
Mean.Ann	0.0783233	0.0780897
SD.Ann	0.1843560	0.1847728
SR.Ann	0.4248483	0.4226256
Skew	0.1921688	0.1842556
Ex.Kurt	7.8282921	7.8504920

3. Report (up to 8 decimal digits) the correlation between your time series and French's time series, and the maximum absolute difference between the two time series. It is zero? If not, justify whether the difference is economically negligible or not. What are the reasons a nonzero difference? You should be comparing between July 1926 to December 2018, at a monthly frequency.

Table 3: Correlation & Difference

Correlation	Maximum Absolute Difference
0.9999918	0.0030579