Econometrics Assignment 3

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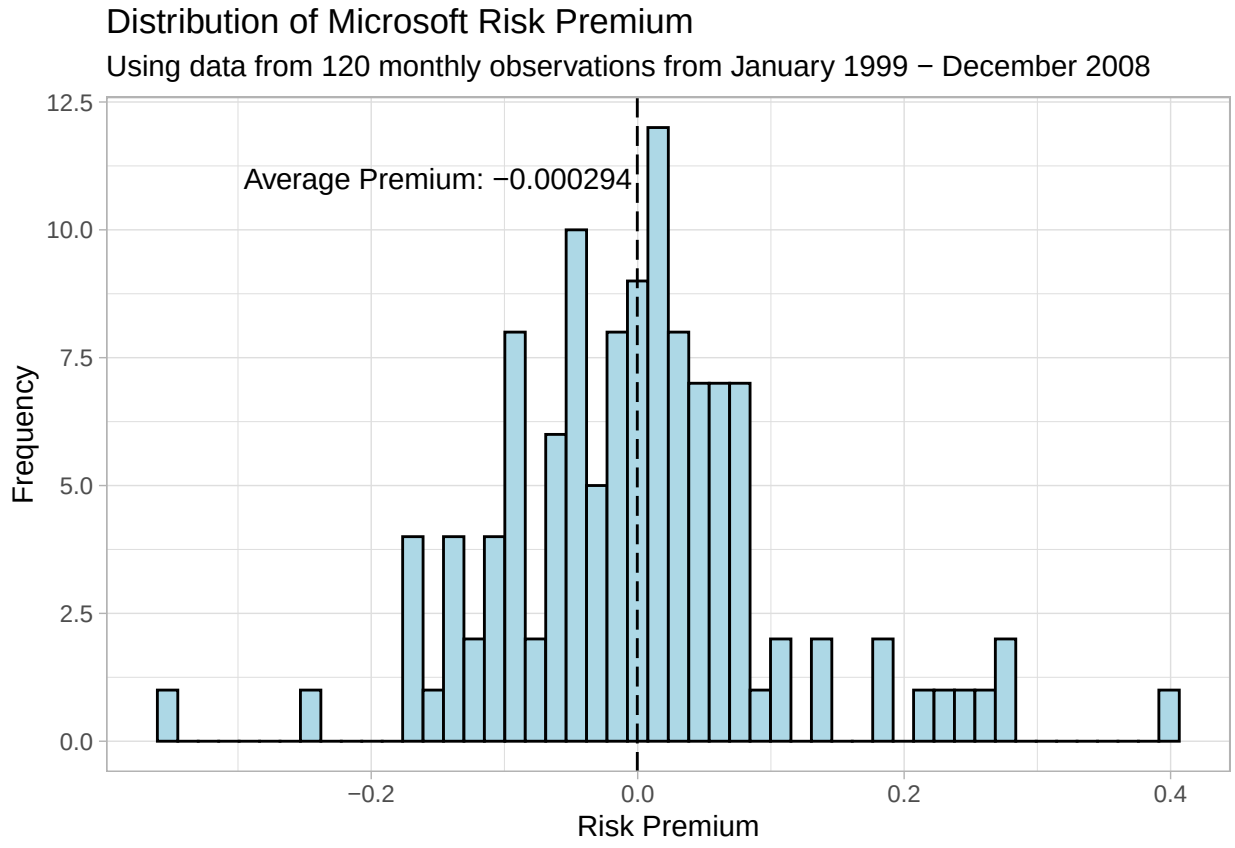
July 2, 2020

C) Data Summary:

Variable	Mean	SD	Min	Max
General Motors Return	−0.0122	0.1291	−0.3893	0.2766
Microsoft Return	0.0023	0.1072	−0.3435	0.4078
Exxon-Mobil Return	0.0097	0.0538	−0.1165	0.2322
General Motors Risk Premium	−0.0147	0.1289	−0.3893	0.2714
Microsoft Risk Premium	−0.0003	0.1072	−0.3479	0.4038
Exxon-Mobil Risk Premium	0.0072	0.0537	−0.1195	0.2301
Market Return	0.0009	0.0464	−0.1847	0.0839
Market Risk Premium	−0.0017	0.0463	−0.1849	0.0819
Risk Free Return	0.0026	0.0014	0.0000	0.0052

D)



E)

Using OLS regression of company risk premium on the market risk premium, we find that the CAPM beta values for the three companies are as follows: Microsoft: 1.332; General Motors: 1.302; Exxon-Mobil: 0.395.

These security beta values sugest Microsoft and General Motors are more aggressive stocks - with Microsoft being slightly more aggressive - while Exxon-Mobil presents a more defensive position.

F)

```
null <- 1
se_msft <- 0.174326
beta_msft <- 1.33228
t_msft <- (beta_msft - null) / (se_msft)
p_msft <- 2*(1 - 0.9716)
# p-value Microsoft 0.0568

se_gm <- 0.22656
beta_gm <- 1.30222
t_gm <- (beta_gm - null) / (se_gm)
p_gm <- 2*(1 - 0.9082)
# p-value GM 0.1836

se_xom <- 0.1005
beta_xom <- 0.3945
t_xom <- (beta_xom - null) / (se_xom)
# p-value Exxon < 0.0001
```

Based on the above calculations, we find the p-value for Microsoft is 0.0568, which is greater than the alpha value of 0.05 at a 5% significance level. Therefore, we reject the null hypothesis that the beta for Microsoft is equal to 1 at a 5% significance level. The p-value of General Motors is 0.1836, well above 0.05; we are unable to reject the null hypothesis that the beta of General Motors is 1. The p-value of Exxon-Mobil is extremely close to 0 and well below 0.05, meaning we are able to reject the null hypothesis that the beta of Exxon-Mobil is equal to 1.