Predictive Project 2.2

Raviteja Ayyagari, Venkatesh Subramaniam, Abdulaziz Alseiyagh

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#Predictive Project 2.2  
  
#Setting the working directory for the project and reading the source data  
setwd('/Users/ravitejaayyagari/Documents/Teja/Saint Peters/3 Sem/Predictive')  
  
IWB<-read.csv('IWB\_holdings.csv', header = T, sep =',')  
IWM<-read.csv('IWM\_holdings.csv', header = T, sep =',')  
stock\_data<-read.csv('data\_file\_ARQ.csv', header = T, sep =',')  
  
#initializing the returns vector and loading values into it  
return\_price<-vector();  
  
#Calculating the returnprice for each price value  
for(i in 2:length(stock\_data[,1])){  
 if (identical(stock\_data[i,1],stock\_data[i-1,1])){  
 return\_price[i] = (stock\_data[i,72]/stock\_data[i-1,72]);  
 }else{  
 return\_price[i] = 0;  
 }  
}  
  
return\_price[1]=0;  
#combining columns wise   
stock\_data<-cbind(stock\_data,return\_price)  
  
#Removing the Variables with more than 60% of blank values and then performing the Na.Omit  
stock\_data1<- subset(stock\_data, select = -c(`assetsavg`, `assetturnover`, `equityavg`, `invcapavg`, `liabilitiesnc`, `roa`, `roe`, `roic`, `ros`))  
stock\_data2 <- na.omit(stock\_data1)  
  
#We decide on the top 20 indicators  
stock\_final<-subset(stock\_data2,select = c(`ticker`, `calendardate`,`pe1`,`evebit`,`evebitda`,`pe`,`pb`,`price`,`marketcap`,`capex`,`ps`,`taxexp`,`ev`,`ps1`,`cashnequsd`,`fcfps`,`intexp`,`assetsnc`,`eps`,`assetsc`,`ebitdausd`,`netinccmnusd`,`return\_price`))  
names(stock\_final)[1] <- "Ticker"  
#Again removing NAs  
stock\_final <- na.omit(stock\_final)  
  
Sector1 <- IWB[IWB$Sector == "Health Care",]  
Sector2 <- IWM[IWM$Sector == "Health Care",]  
  
Sector\_HC <- rbind(Sector1,Sector2)  
  
Sector\_HC <- subset(Sector\_HC, select = -c(`Name`, `Asset.Class`,`Weight....`, `Price`, `Shares`, `Market.Value`, `Notional.Value`, `Sector`, `SEDOL`, `ISIN`, `Exchange`))  
  
HC\_ARQ <- merge(stock\_final,Sector\_HC,by="Ticker")  
  
#Converting the calendardate column to date  
HC\_ARQ$calendardate <- as.Date(HC\_ARQ$calendardate, format = "%Y-%m-%d")  
  
#Again, finding the unique date values and converting them to date format  
cal\_date<-unique(HC\_ARQ$calendardate)  
cal\_date <- as.data.frame(cal\_date)  
  
#Removing Outliers

remove\_outliers <- function(x, na.rm = TRUE, ...) {  
 qnt <- quantile(x, probs=c(.25, .75), na.rm = na.rm, ...)  
 H <- 1.5 \* IQR(x, na.rm = na.rm)  
 y <- x  
 y[x < (qnt[1] - H)] <- NA  
 y[x > (qnt[2] + H)] <- NA  
 y  
}  
  
for (i in 3:22){  
 HC\_ARQ[,i] <-remove\_outliers(HC\_ARQ[,i])  
}  
  
#Removing na.s  
HC\_ARQ <- na.omit(HC\_ARQ)  
  
#Normalizing Data  
HC\_ARQ1 <- as.data.frame(scale(HC\_ARQ[,3:22]))   
  
#Traditional way of doing normalizing  
# for(k in 2:21){  
# for(i in 1:dim(stock\_final)[1]){  
# y[i,k-1]<-(stock\_final[i,k]-mean(stock\_final[,k]))/sd(stock\_final[,k])  
# }  
# }  
  
#Combining the Datasets  
HC\_Data <- cbind(HC\_ARQ1, HC\_ARQ$calendardate, HC\_ARQ$return\_price)  
  
#Renaming Columns  
names(HC\_Data)[21] <- 'calendardate'  
names(HC\_Data)[22] <- 'return\_price'  
  
#Creating dataframe for storing betas  
nms <- sample(LETTERS,sample(1:10))  
betas<-as.data.frame(t(matrix(nrow=length(nms),ncol=0,dimnames=list(nms))))  
  
#Unique Calendar Dates  
cal\_date<-unique(HC\_Data$calendardate)  
cal\_date <- as.data.frame(cal\_date)  
  
#Running the for loop for only 15 dates  
for (i in 1:15){  
 data\_model<-subset(HC\_Data, HC\_Data$calendardate==cal\_date[i,])  
 colnames(data\_model)<-colnames(HC\_Data)  
 data\_model<-subset(data\_model, select = -c(`calendardate`))  
 model<-lm(log(data\_model$return\_price)~.,data=data\_model)  
 print(summary(model))  
 for (j in 1:21){  
 betas[i,j] <-model$coefficients[j]  
 }  
}

##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.62351 -0.11689 0.01186 0.12405 0.61750   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) -0.1568932 0.0314476 -4.989 4.07e-06 \*\*\*  
## pe1 0.2358342 0.1575399 1.497 0.139   
## evebit 0.0227300 0.0831141 0.273 0.785   
## evebitda -0.0062782 0.0880363 -0.071 0.943   
## pe -0.2615994 0.1708462 -1.531 0.130   
## pb 0.0103599 0.0428430 0.242 0.810   
## price 0.0430570 0.0399430 1.078 0.285   
## marketcap 0.2219504 0.4824774 0.460 0.647   
## capex 0.0576732 0.0489884 1.177 0.243   
## ps -0.7584937 0.5394370 -1.406 0.164   
## taxexp -0.1017588 0.0884639 -1.150 0.254   
## ev -0.1694427 0.5261948 -0.322 0.748   
## ps1 0.6569421 0.5027028 1.307 0.195   
## cashnequsd -0.0238761 0.0643618 -0.371 0.712   
## fcfps -0.0009339 0.0468876 -0.020 0.984   
## intexp 0.0251800 0.0807773 0.312 0.756   
## assetsnc -0.1165787 0.1073874 -1.086 0.281   
## eps 0.0623358 0.0667632 0.934 0.354   
## assetsc -0.0012469 0.0789728 -0.016 0.987   
## ebitdausd 0.3734903 0.3725176 1.003 0.319   
## netinccmnusd -0.2560686 0.2660079 -0.963 0.339   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.229 on 72 degrees of freedom  
## Multiple R-squared: 0.2333, Adjusted R-squared: 0.02032   
## F-statistic: 1.095 on 20 and 72 DF, p-value: 0.3733  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.65810 -0.13665 0.00488 0.13721 0.47544   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.1092629 0.0304395 3.590 0.000637 \*\*\*  
## pe1 -0.1491161 0.2418347 -0.617 0.539650   
## evebit -0.0003547 0.1865277 -0.002 0.998488   
## evebitda -0.0184729 0.0988042 -0.187 0.852270   
## pe 0.1683846 0.2354965 0.715 0.477157   
## pb 0.0286802 0.0386611 0.742 0.460858   
## price 0.0196916 0.0351735 0.560 0.577512   
## marketcap 0.0301767 0.4106859 0.073 0.941651   
## capex 0.0313370 0.0481776 0.650 0.517696   
## ps 0.1922097 0.1106019 1.738 0.086973 .   
## taxexp 0.0134762 0.0965683 0.140 0.889446   
## ev -0.0437628 0.4531885 -0.097 0.923368   
## ps1 -0.1506274 0.1210035 -1.245 0.217668   
## cashnequsd -0.0413226 0.0568072 -0.727 0.469582   
## fcfps -0.0054432 0.0366694 -0.148 0.882456   
## intexp 0.0660413 0.0800198 0.825 0.412213   
## assetsnc -0.0201704 0.0860098 -0.235 0.815324   
## eps 0.0190263 0.0528990 0.360 0.720259   
## assetsc 0.0261270 0.0623134 0.419 0.676391   
## ebitdausd 0.0151218 0.3851590 0.039 0.968802   
## netinccmnusd 0.0169610 0.2539791 0.067 0.946961   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.22 on 65 degrees of freedom  
## Multiple R-squared: 0.1894, Adjusted R-squared: -0.06005   
## F-statistic: 0.7592 on 20 and 65 DF, p-value: 0.7498  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -1.36028 -0.10995 0.00458 0.14617 0.67043   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) -0.168900 0.027893 -6.055 2.25e-08 \*\*\*  
## pe1 -0.254013 0.481800 -0.527 0.5992   
## evebit -0.076739 0.070874 -1.083 0.2814   
## evebitda -0.057119 0.044398 -1.287 0.2011   
## pe 0.336808 0.480560 0.701 0.4850   
## pb 0.058420 0.040197 1.453 0.1491   
## price 0.022939 0.036282 0.632 0.5286   
## marketcap -0.183171 0.459654 -0.398 0.6911   
## capex 0.002866 0.057295 0.050 0.9602   
## ps -0.322184 0.345239 -0.933 0.3529   
## taxexp -0.164299 0.076414 -2.150 0.0339 \*   
## ev 0.273935 0.506902 0.540 0.5901   
## ps1 0.315860 0.332490 0.950 0.3443   
## cashnequsd 0.045960 0.058506 0.786 0.4339   
## fcfps 0.037969 0.039740 0.955 0.3416   
## intexp -0.044877 0.071918 -0.624 0.5340   
## assetsnc -0.086402 0.095333 -0.906 0.3669   
## eps 0.026695 0.053759 0.497 0.6205   
## assetsc -0.145586 0.079917 -1.822 0.0714 .   
## ebitdausd 0.476281 0.321280 1.482 0.1412   
## netinccmnusd -0.216392 0.225075 -0.961 0.3386   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.2819 on 104 degrees of freedom  
## Multiple R-squared: 0.3722, Adjusted R-squared: 0.2515   
## F-statistic: 3.084 on 20 and 104 DF, p-value: 0.0001001  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.67334 -0.07733 0.00681 0.09446 0.37824   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.034837 0.024205 1.439 0.1554   
## pe1 -0.073822 0.119587 -0.617 0.5394   
## evebit -0.135287 0.070429 -1.921 0.0596 .  
## evebitda 0.007397 0.033458 0.221 0.8258   
## pe 0.231325 0.138309 1.673 0.0997 .  
## pb 0.028727 0.042217 0.680 0.4989   
## price 0.026942 0.036789 0.732 0.4669   
## marketcap 0.278004 0.423499 0.656 0.5141   
## capex -0.069824 0.066489 -1.050 0.2979   
## ps 0.520291 0.337895 1.540 0.1290   
## taxexp 0.100822 0.083731 1.204 0.2334   
## ev -0.410210 0.462625 -0.887 0.3788   
## ps1 -0.456906 0.316371 -1.444 0.1540   
## cashnequsd 0.014746 0.056403 0.261 0.7947   
## fcfps 0.018485 0.033316 0.555 0.5811   
## intexp 0.049122 0.060898 0.807 0.4231   
## assetsnc 0.131521 0.078858 1.668 0.1006   
## eps -0.090160 0.059528 -1.515 0.1352   
## assetsc 0.038316 0.048837 0.785 0.4358   
## ebitdausd -0.546660 0.326384 -1.675 0.0992 .  
## netinccmnusd 0.506313 0.227485 2.226 0.0299 \*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.1864 on 59 degrees of freedom  
## Multiple R-squared: 0.3031, Adjusted R-squared: 0.06687   
## F-statistic: 1.283 on 20 and 59 DF, p-value: 0.2266  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.36769 -0.11579 -0.00748 0.11250 0.36395   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) -0.032297 0.043144 -0.749 0.4565   
## pe1 -0.755360 0.338346 -2.233 0.0286 \*  
## evebit -0.001975 0.073217 -0.027 0.9786   
## evebitda 0.012930 0.086652 0.149 0.8818   
## pe 0.826622 0.345200 2.395 0.0192 \*  
## pb 0.054845 0.025611 2.141 0.0356 \*  
## price 0.005738 0.038491 0.149 0.8819   
## marketcap 0.235278 0.383265 0.614 0.5412   
## capex 0.006198 0.044636 0.139 0.8900   
## ps 0.116689 1.119742 0.104 0.9173   
## taxexp -0.010309 0.045103 -0.229 0.8199   
## ev -0.326561 0.397642 -0.821 0.4142   
## ps1 -0.103064 1.062172 -0.097 0.9230   
## cashnequsd -0.019570 0.054235 -0.361 0.7193   
## fcfps 0.054573 0.037206 1.467 0.1467   
## intexp 0.006337 0.049669 0.128 0.8988   
## assetsnc 0.003140 0.041810 0.075 0.9403   
## eps -0.056664 0.048879 -1.159 0.2501   
## assetsc -0.024733 0.040921 -0.604 0.5474   
## ebitdausd 0.281461 0.203856 1.381 0.1716   
## netinccmnusd -0.176884 0.147988 -1.195 0.2359   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.1782 on 73 degrees of freedom  
## Multiple R-squared: 0.2141, Adjusted R-squared: -0.001232   
## F-statistic: 0.9943 on 20 and 73 DF, p-value: 0.4792  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.34322 -0.09012 -0.01870 0.07571 0.44390   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.040451 0.019120 2.116 0.0382 \*  
## pe1 0.259080 0.303861 0.853 0.3970   
## evebit -0.053291 0.077580 -0.687 0.4945   
## evebitda 0.020238 0.030128 0.672 0.5041   
## pe -0.170411 0.283819 -0.600 0.5503   
## pb 0.043091 0.028839 1.494 0.1399   
## price -0.018583 0.030818 -0.603 0.5486   
## marketcap 0.066633 0.315671 0.211 0.8335   
## capex 0.035426 0.036144 0.980 0.3306   
## ps 0.385914 0.298346 1.294 0.2003   
## taxexp 0.068214 0.047867 1.425 0.1588   
## ev -0.089050 0.328889 -0.271 0.7874   
## ps1 -0.368174 0.295540 -1.246 0.2173   
## cashnequsd -0.048660 0.049647 -0.980 0.3306   
## fcfps -0.024911 0.025330 -0.983 0.3290   
## intexp 0.032511 0.035018 0.928 0.3566   
## assetsnc 0.007952 0.048667 0.163 0.8707   
## eps 0.009354 0.042109 0.222 0.8249   
## assetsc 0.070111 0.046360 1.512 0.1352   
## ebitdausd -0.139330 0.191416 -0.728 0.4693   
## netinccmnusd 0.088834 0.137575 0.646 0.5207   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.1565 on 66 degrees of freedom  
## Multiple R-squared: 0.2252, Adjusted R-squared: -0.00954   
## F-statistic: 0.9594 on 20 and 66 DF, p-value: 0.5196  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.32318 -0.07881 0.00619 0.08164 0.30441   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.0892241 0.0331177 2.694 0.0093 \*\*  
## pe1 0.1496089 0.0852869 1.754 0.0849 .   
## evebit 0.0528426 0.0393367 1.343 0.1846   
## evebitda -0.0430309 0.0339701 -1.267 0.2105   
## pe -0.1120698 0.0905849 -1.237 0.2212   
## pb 0.0008392 0.0293968 0.029 0.9773   
## price 0.0081706 0.0353176 0.231 0.8179   
## marketcap 0.2432886 0.3537768 0.688 0.4945   
## capex -0.0145954 0.0328242 -0.445 0.6583   
## ps 2.1008554 1.0060079 2.088 0.0413 \*   
## taxexp -0.0214507 0.0467699 -0.459 0.6483   
## ev -0.2209613 0.3810432 -0.580 0.5643   
## ps1 -1.9078848 0.9473768 -2.014 0.0488 \*   
## cashnequsd -0.0912147 0.0379543 -2.403 0.0196 \*   
## fcfps 0.0166767 0.0279159 0.597 0.5527   
## intexp 0.0704959 0.0354376 1.989 0.0516 .   
## assetsnc -0.0053289 0.0837142 -0.064 0.9495   
## eps 0.0265031 0.0542758 0.488 0.6272   
## assetsc 0.0506318 0.0475391 1.065 0.2914   
## ebitdausd -0.0710397 0.2239975 -0.317 0.7523   
## netinccmnusd 0.0401171 0.1640995 0.244 0.8078   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.1416 on 56 degrees of freedom  
## Multiple R-squared: 0.3809, Adjusted R-squared: 0.1598   
## F-statistic: 1.723 on 20 and 56 DF, p-value: 0.05692  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.41617 -0.10396 -0.02138 0.08918 0.49217   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.084901 0.028052 3.027 0.00394 \*\*  
## pe1 -0.335254 0.688609 -0.487 0.62853   
## evebit 0.040127 0.154324 0.260 0.79594   
## evebitda -0.085371 0.130914 -0.652 0.51737   
## pe 0.372340 0.694342 0.536 0.59421   
## pb 0.091877 0.034061 2.697 0.00956 \*\*  
## price 0.025422 0.044860 0.567 0.57351   
## marketcap -0.289370 0.431768 -0.670 0.50588   
## capex -0.003689 0.044845 -0.082 0.93477   
## ps 0.211092 0.138334 1.526 0.13345   
## taxexp 0.081927 0.089521 0.915 0.36459   
## ev 0.210660 0.444408 0.474 0.63759   
## ps1 -0.177727 0.136632 -1.301 0.19942   
## cashnequsd -0.060034 0.059928 -1.002 0.32138   
## fcfps -0.040257 0.038757 -1.039 0.30403   
## intexp 0.003858 0.061907 0.062 0.95056   
## assetsnc 0.075640 0.068169 1.110 0.27259   
## eps -0.002540 0.068399 -0.037 0.97052   
## assetsc 0.131198 0.063967 2.051 0.04563 \*   
## ebitdausd -0.498810 0.355824 -1.402 0.16726   
## netinccmnusd 0.460278 0.242787 1.896 0.06389 .   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.1951 on 49 degrees of freedom  
## Multiple R-squared: 0.4141, Adjusted R-squared: 0.1749   
## F-statistic: 1.732 on 20 and 49 DF, p-value: 0.06014  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.64732 -0.08857 0.01506 0.12088 0.30497   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.05150 0.03768 1.367 0.1761   
## pe1 -0.14739 0.48828 -0.302 0.7637   
## evebit 0.04293 0.11340 0.379 0.7061   
## evebitda -0.01871 0.09284 -0.202 0.8409   
## pe 0.17428 0.50507 0.345 0.7311   
## pb 0.05625 0.03243 1.734 0.0873 .  
## price 0.04457 0.03348 1.331 0.1874   
## marketcap 0.27593 0.40382 0.683 0.4967   
## capex -0.07472 0.04714 -1.585 0.1175   
## ps 1.00371 0.82361 1.219 0.2271   
## taxexp 0.07213 0.08446 0.854 0.3960   
## ev -0.40513 0.43984 -0.921 0.3602   
## ps1 -0.91383 0.77903 -1.173 0.2448   
## cashnequsd -0.03629 0.05214 -0.696 0.4887   
## fcfps 0.01193 0.03473 0.344 0.7322   
## intexp 0.13377 0.06871 1.947 0.0555 .  
## assetsnc 0.04808 0.10422 0.461 0.6460   
## eps -0.08273 0.05405 -1.530 0.1304   
## assetsc 0.03109 0.08102 0.384 0.7023   
## ebitdausd -0.42400 0.34976 -1.212 0.2295   
## netinccmnusd 0.45768 0.25340 1.806 0.0752 .  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.2109 on 70 degrees of freedom  
## Multiple R-squared: 0.3171, Adjusted R-squared: 0.122   
## F-statistic: 1.625 on 20 and 70 DF, p-value: 0.07073  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.61422 -0.12421 0.01279 0.14025 0.46994   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) -0.1627176 0.0304560 -5.343 9.02e-07 \*\*\*  
## pe1 0.6491408 0.4731898 1.372 0.1741   
## evebit -0.0001846 0.0659772 -0.003 0.9978   
## evebitda 0.0357106 0.0538212 0.664 0.5090   
## pe -0.6418544 0.4887045 -1.313 0.1930   
## pb 0.0528731 0.0286487 1.846 0.0688 .   
## price 0.0596634 0.0552369 1.080 0.2835   
## marketcap -0.0970746 0.6503336 -0.149 0.8817   
## capex 0.0032861 0.0858704 0.038 0.9696   
## ps 0.0276645 0.1712363 0.162 0.8721   
## taxexp -0.1117767 0.0914541 -1.222 0.2254   
## ev 0.1065144 0.6723332 0.158 0.8745   
## ps1 -0.0481183 0.1725064 -0.279 0.7810   
## cashnequsd 0.0028491 0.0764268 0.037 0.9704   
## fcfps -0.0388481 0.0468915 -0.828 0.4100   
## intexp -0.0429054 0.0760215 -0.564 0.5741   
## assetsnc -0.0379246 0.0683210 -0.555 0.5804   
## eps -0.0477476 0.0581241 -0.821 0.4139   
## assetsc -0.0341123 0.0578915 -0.589 0.5574   
## ebitdausd 0.2406382 0.3813894 0.631 0.5299   
## netinccmnusd -0.0785574 0.2547893 -0.308 0.7587   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.2285 on 77 degrees of freedom  
## Multiple R-squared: 0.2198, Adjusted R-squared: 0.01714   
## F-statistic: 1.085 on 20 and 77 DF, p-value: 0.3825  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.54068 -0.06659 0.00256 0.09481 0.54878   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.106221 0.041133 2.582 0.01250 \*   
## pe1 0.247450 0.314165 0.788 0.43429   
## evebit -0.083691 0.178836 -0.468 0.64165   
## evebitda -0.065323 0.114855 -0.569 0.57184   
## pe -0.117146 0.317004 -0.370 0.71314   
## pb -0.057724 0.042692 -1.352 0.18188   
## price -0.095921 0.045223 -2.121 0.03844 \*   
## marketcap -0.267724 0.487100 -0.550 0.58480   
## capex -0.072373 0.054355 -1.331 0.18852   
## ps 1.238312 1.159094 1.068 0.29003   
## taxexp 0.015392 0.088113 0.175 0.86197   
## ev 0.511371 0.506368 1.010 0.31697   
## ps1 -1.189921 1.084350 -1.097 0.27727   
## cashnequsd 0.008702 0.067868 0.128 0.89844   
## fcfps 0.026104 0.034639 0.754 0.45431   
## intexp -0.120580 0.070780 -1.704 0.09410 .   
## assetsnc -0.050900 0.090551 -0.562 0.57632   
## eps 0.225938 0.073428 3.077 0.00326 \*\*  
## assetsc -0.070227 0.070002 -1.003 0.32015   
## ebitdausd -0.043794 0.248939 -0.176 0.86100   
## netinccmnusd -0.230973 0.187346 -1.233 0.22287   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.2032 on 55 degrees of freedom  
## Multiple R-squared: 0.2836, Adjusted R-squared: 0.02314   
## F-statistic: 1.089 on 20 and 55 DF, p-value: 0.3867  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.40554 -0.09170 -0.02148 0.07000 0.67583   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.11692 0.02654 4.406 3.89e-05 \*\*\*  
## pe1 -0.11219 0.31792 -0.353 0.72527   
## evebit -0.13809 0.09933 -1.390 0.16908   
## evebitda -0.05932 0.04157 -1.427 0.15821   
## pe 0.24919 0.30286 0.823 0.41354   
## pb 0.01008 0.02855 0.353 0.72505   
## price -0.02261 0.04695 -0.482 0.63165   
## marketcap -0.37811 0.42905 -0.881 0.38132   
## capex 0.02293 0.04804 0.477 0.63465   
## ps 0.57193 0.17681 3.235 0.00189 \*\*   
## taxexp -0.03342 0.04101 -0.815 0.41804   
## ev 0.42235 0.43952 0.961 0.34004   
## ps1 -0.54121 0.19382 -2.792 0.00681 \*\*   
## cashnequsd -0.03525 0.07005 -0.503 0.61645   
## fcfps 0.03748 0.02854 1.313 0.19364   
## intexp -0.04533 0.04293 -1.056 0.29478   
## assetsnc -0.02608 0.09728 -0.268 0.78949   
## eps -0.01621 0.06382 -0.254 0.80021   
## assetsc 0.05589 0.05693 0.982 0.32976   
## ebitdausd -0.03368 0.10280 -0.328 0.74421   
## netinccmnusd 0.08206 0.08963 0.916 0.36317   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.2061 on 67 degrees of freedom  
## Multiple R-squared: 0.3278, Adjusted R-squared: 0.1272   
## F-statistic: 1.634 on 20 and 67 DF, p-value: 0.07009  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.89805 -0.07335 0.00316 0.13093 0.38193   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)  
## (Intercept) 0.001326 0.032009 0.041 0.967  
## pe1 0.671998 0.539195 1.246 0.217  
## evebit 0.172310 0.133115 1.294 0.200  
## evebitda -0.088521 0.099832 -0.887 0.378  
## pe -0.770302 0.575871 -1.338 0.185  
## pb 0.001419 0.028546 0.050 0.961  
## price 0.062472 0.053549 1.167 0.247  
## marketcap 0.044765 0.400937 0.112 0.911  
## capex -0.011075 0.041119 -0.269 0.788  
## ps 0.750764 0.738921 1.016 0.313  
## taxexp 0.029958 0.066070 0.453 0.652  
## ev -0.117448 0.424993 -0.276 0.783  
## ps1 -0.671540 0.710723 -0.945 0.348  
## cashnequsd -0.047633 0.052756 -0.903 0.370  
## fcfps 0.064830 0.042174 1.537 0.129  
## intexp 0.046722 0.045731 1.022 0.310  
## assetsnc 0.008814 0.073998 0.119 0.906  
## eps -0.052886 0.074819 -0.707 0.482  
## assetsc 0.060729 0.057170 1.062 0.292  
## ebitdausd -0.168638 0.257582 -0.655 0.515  
## netinccmnusd 0.201262 0.185769 1.083 0.282  
##   
## Residual standard error: 0.2153 on 70 degrees of freedom  
## Multiple R-squared: 0.1987, Adjusted R-squared: -0.03022   
## F-statistic: 0.868 on 20 and 70 DF, p-value: 0.6256  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.66858 -0.08238 0.01366 0.10046 0.61056   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) -0.131991 0.028154 -4.688 1.59e-05 \*\*\*  
## pe1 -0.566156 0.474479 -1.193 0.2374   
## evebit 0.042307 0.141222 0.300 0.7655   
## evebitda -0.050769 0.108268 -0.469 0.6408   
## pe 0.598359 0.484835 1.234 0.2219   
## pb 0.001096 0.034374 0.032 0.9747   
## price 0.069603 0.049546 1.405 0.1651   
## marketcap 0.321338 0.448117 0.717 0.4761   
## capex 0.041449 0.058272 0.711 0.4796   
## ps -0.266458 0.504770 -0.528 0.5995   
## taxexp -0.057030 0.088225 -0.646 0.5204   
## ev -0.370884 0.465479 -0.797 0.4287   
## ps1 0.199195 0.486822 0.409 0.6838   
## cashnequsd 0.029829 0.054056 0.552 0.5831   
## fcfps 0.052495 0.034052 1.542 0.1283   
## intexp 0.026157 0.061760 0.424 0.6734   
## assetsnc 0.004600 0.085763 0.054 0.9574   
## eps -0.053900 0.065755 -0.820 0.4156   
## assetsc -0.121109 0.065625 -1.845 0.0698 .   
## ebitdausd 0.473289 0.338515 1.398 0.1671   
## netinccmnusd -0.287892 0.226501 -1.271 0.2085   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.2104 on 61 degrees of freedom  
## Multiple R-squared: 0.419, Adjusted R-squared: 0.2285   
## F-statistic: 2.2 on 20 and 61 DF, p-value: 0.009732  
##   
##   
## Call:  
## lm(formula = log(data\_model$return\_price) ~ ., data = data\_model)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.72455 -0.09307 0.01472 0.11215 0.50032   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.007601 0.028812 0.264 0.7927   
## pe1 0.267733 0.567234 0.472 0.6384   
## evebit 0.131159 0.085402 1.536 0.1290   
## evebitda -0.127717 0.079396 -1.609 0.1121   
## pe -0.254196 0.582906 -0.436 0.6641   
## pb 0.009806 0.034544 0.284 0.7773   
## price -0.058618 0.062135 -0.943 0.3486   
## marketcap -0.391516 0.487640 -0.803 0.4247   
## capex -0.012142 0.043671 -0.278 0.7818   
## ps 0.109765 0.188128 0.583 0.5614   
## taxexp -0.010659 0.070069 -0.152 0.8795   
## ev 0.509358 0.528402 0.964 0.3383   
## ps1 -0.036385 0.194721 -0.187 0.8523   
## cashnequsd 0.031436 0.051362 0.612 0.5424   
## fcfps -0.033940 0.044213 -0.768 0.4452   
## intexp -0.021274 0.054992 -0.387 0.7000   
## assetsnc -0.065599 0.079153 -0.829 0.4100   
## eps 0.196514 0.086043 2.284 0.0253 \*  
## assetsc -0.017935 0.059315 -0.302 0.7632   
## ebitdausd -0.044823 0.226736 -0.198 0.8438   
## netinccmnusd -0.049929 0.161372 -0.309 0.7579   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.2283 on 72 degrees of freedom  
## Multiple R-squared: 0.2218, Adjusted R-squared: 0.005665   
## F-statistic: 1.026 on 20 and 72 DF, p-value: 0.4445

#Preparing Data for Time Series  
data\_ts<- HC\_Data[order(HC\_Data$calendardate),]  
cal\_date<-unique(HC\_Data$calendardate)  
cal\_date<-as.data.frame(cal\_date)  
cal\_date<-cal\_date[order(cal\_date),]  
  
#Time Series  
tr <- betas  
tr$date <- cal\_date[1:15]  
tr$date <- as.Date(tr$date, format = "%Y-%m-%d")  
  
#Performing Arima Time Series and Predicting betas for dates 16-19  
library(forecast)

## Warning: package 'forecast' was built under R version 3.3.2

for (j in 1:21){  
 for (i in 16:19){  
 coeff <- ts(tr[,j], start = c(2011,03), end = c(2014,09), frequency = 15+(i-15))  
 print(tr[,j])  
 fit <- arima(coeff, order = c(1,0,2))  
 pr <- predict(fit,n.ahead = 1)  
 tr[i, j] <- as.numeric(pr$pred)  
 }  
}

## [1] -0.156893177 0.109262904 -0.168899557 0.034836709 -0.032297307  
## [6] 0.040451020 0.089224099 0.084900510 0.051502173 -0.162717556  
## [11] 0.106220798 0.116924772 0.001326178 -0.131991471 0.007601421  
## [1] -0.156893177 0.109262904 -0.168899557 0.034836709 -0.032297307  
## [6] 0.040451020 0.089224099 0.084900510 0.051502173 -0.162717556  
## [11] 0.106220798 0.116924772 0.001326178 -0.131991471 0.007601421  
## [16] 0.041166763  
## [1] -0.156893177 0.109262904 -0.168899557 0.034836709 -0.032297307  
## [6] 0.040451020 0.089224099 0.084900510 0.051502173 -0.162717556  
## [11] 0.106220798 0.116924772 0.001326178 -0.131991471 0.007601421  
## [16] 0.041166763 0.050563578  
## [1] -0.156893177 0.109262904 -0.168899557 0.034836709 -0.032297307  
## [6] 0.040451020 0.089224099 0.084900510 0.051502173 -0.162717556  
## [11] 0.106220798 0.116924772 0.001326178 -0.131991471 0.007601421  
## [16] 0.041166763 0.050563578 0.042228458  
## [1] 0.23583417 -0.14911611 -0.25401323 -0.07382217 -0.75536047  
## [6] 0.25907965 0.14960889 -0.33525380 -0.14739240 0.64914080  
## [11] 0.24744995 -0.11219252 0.67199800 -0.56615622 0.26773263  
## [16] NA NA NA NA  
## [1] 0.23583417 -0.14911611 -0.25401323 -0.07382217 -0.75536047  
## [6] 0.25907965 0.14960889 -0.33525380 -0.14739240 0.64914080  
## [11] 0.24744995 -0.11219252 0.67199800 -0.56615622 0.26773263  
## [16] -0.01305237 NA NA NA  
## [1] 0.23583417 -0.14911611 -0.25401323 -0.07382217 -0.75536047  
## [6] 0.25907965 0.14960889 -0.33525380 -0.14739240 0.64914080  
## [11] 0.24744995 -0.11219252 0.67199800 -0.56615622 0.26773263  
## [16] -0.01305237 -0.08223739 NA NA  
## [1] 0.23583417 -0.14911611 -0.25401323 -0.07382217 -0.75536047  
## [6] 0.25907965 0.14960889 -0.33525380 -0.14739240 0.64914080  
## [11] 0.24744995 -0.11219252 0.67199800 -0.56615622 0.26773263  
## [16] -0.01305237 -0.08223739 -0.01911140 NA  
## [1] 0.0227299886 -0.0003547292 -0.0767391538 -0.1352865343 -0.0019750039  
## [6] -0.0532914040 0.0528426383 0.0401271468 0.0429298448 -0.0001846170  
## [11] -0.0836912862 -0.1380905873 0.1723103828 0.0423066268 0.1311586330  
## [16] NA NA NA NA  
## [1] 0.0227299886 -0.0003547292 -0.0767391538 -0.1352865343 -0.0019750039  
## [6] -0.0532914040 0.0528426383 0.0401271468 0.0429298448 -0.0001846170  
## [11] -0.0836912862 -0.1380905873 0.1723103828 0.0423066268 0.1311586330  
## [16] -0.0045359823 NA NA NA  
## [1] 0.0227299886 -0.0003547292 -0.0767391538 -0.1352865343 -0.0019750039  
## [6] -0.0532914040 0.0528426383 0.0401271468 0.0429298448 -0.0001846170  
## [11] -0.0836912862 -0.1380905873 0.1723103828 0.0423066268 0.1311586330  
## [16] -0.0045359823 0.0073258287 NA NA  
## [1] 0.0227299886 -0.0003547292 -0.0767391538 -0.1352865343 -0.0019750039  
## [6] -0.0532914040 0.0528426383 0.0401271468 0.0429298448 -0.0001846170  
## [11] -0.0836912862 -0.1380905873 0.1723103828 0.0423066268 0.1311586330  
## [16] -0.0045359823 0.0073258287 -0.0483739083 NA  
## [1] -0.006278176 -0.018472938 -0.057119168 0.007396663 0.012929583  
## [6] 0.020237568 -0.043030868 -0.085370795 -0.018711344 0.035710603  
## [11] -0.065323365 -0.059317631 -0.088521080 -0.050768900 -0.127717062  
## [16] NA NA NA NA  
## [1] -0.006278176 -0.018472938 -0.057119168 0.007396663 0.012929583  
## [6] 0.020237568 -0.043030868 -0.085370795 -0.018711344 0.035710603  
## [11] -0.065323365 -0.059317631 -0.088521080 -0.050768900 -0.127717062  
## [16] -0.025650027 NA NA NA  
## [1] -0.006278176 -0.018472938 -0.057119168 0.007396663 0.012929583  
## [6] 0.020237568 -0.043030868 -0.085370795 -0.018711344 0.035710603  
## [11] -0.065323365 -0.059317631 -0.088521080 -0.050768900 -0.127717062  
## [16] -0.025650027 -0.025558351 NA NA  
## [1] -0.006278176 -0.018472938 -0.057119168 0.007396663 0.012929583  
## [6] 0.020237568 -0.043030868 -0.085370795 -0.018711344 0.035710603  
## [11] -0.065323365 -0.059317631 -0.088521080 -0.050768900 -0.127717062  
## [16] -0.025650027 -0.025558351 -0.025103131 NA  
## [1] -0.2615994 0.1683846 0.3368076 0.2313250 0.8266223 -0.1704114  
## [7] -0.1120698 0.3723398 0.1742789 -0.6418544 -0.1171464 0.2491913  
## [13] -0.7703022 0.5983594 -0.2541956 NA NA NA  
## [19] NA  
## [1] -0.26159936 0.16838462 0.33680764 0.23132502 0.82662227  
## [6] -0.17041145 -0.11206978 0.37233984 0.17427889 -0.64185438  
## [11] -0.11714644 0.24919126 -0.77030222 0.59835938 -0.25419558  
## [16] 0.09914877 NA NA NA  
## [1] -0.26159936 0.16838462 0.33680764 0.23132502 0.82662227  
## [6] -0.17041145 -0.11206978 0.37233984 0.17427889 -0.64185438  
## [11] -0.11714644 0.24919126 -0.77030222 0.59835938 -0.25419558  
## [16] 0.09914877 0.17238729 NA NA  
## [1] -0.26159936 0.16838462 0.33680764 0.23132502 0.82662227  
## [6] -0.17041145 -0.11206978 0.37233984 0.17427889 -0.64185438  
## [11] -0.11714644 0.24919126 -0.77030222 0.59835938 -0.25419558  
## [16] 0.09914877 0.17238729 0.02193600 NA  
## [1] 0.0103598651 0.0286802453 0.0584201024 0.0287270350 0.0548451823  
## [6] 0.0430906486 0.0008392074 0.0918769852 0.0562517286 0.0528730957  
## [11] -0.0577241225 0.0100824524 0.0014187056 0.0010963017 0.0098057535  
## [16] NA NA NA NA  
## [1] 0.0103598651 0.0286802453 0.0584201024 0.0287270350 0.0548451823  
## [6] 0.0430906486 0.0008392074 0.0918769852 0.0562517286 0.0528730957  
## [11] -0.0577241225 0.0100824524 0.0014187056 0.0010963017 0.0098057535  
## [16] 0.0253184502 NA NA NA  
## [1] 0.0103598651 0.0286802453 0.0584201024 0.0287270350 0.0548451823  
## [6] 0.0430906486 0.0008392074 0.0918769852 0.0562517286 0.0528730957  
## [11] -0.0577241225 0.0100824524 0.0014187056 0.0010963017 0.0098057535  
## [16] 0.0253184502 0.0228979542 NA NA  
## [1] 0.0103598651 0.0286802453 0.0584201024 0.0287270350 0.0548451823  
## [6] 0.0430906486 0.0008392074 0.0918769852 0.0562517286 0.0528730957  
## [11] -0.0577241225 0.0100824524 0.0014187056 0.0010963017 0.0098057535  
## [16] 0.0253184502 0.0228979542 0.0288674162 NA  
## [1] 0.043056968 0.019691583 0.022938533 0.026942239 0.005738143  
## [6] -0.018583420 0.008170616 0.025421766 0.044571503 0.059663366  
## [11] -0.095920844 -0.022611980 0.062472223 0.069602752 -0.058618269  
## [16] NA NA NA NA  
## [1] 0.043056968 0.019691583 0.022938533 0.026942239 0.005738143  
## [6] -0.018583420 0.008170616 0.025421766 0.044571503 0.059663366  
## [11] -0.095920844 -0.022611980 0.062472223 0.069602752 -0.058618269  
## [16] 0.008539136 NA NA NA  
## [1] 0.043056968 0.019691583 0.022938533 0.026942239 0.005738143  
## [6] -0.018583420 0.008170616 0.025421766 0.044571503 0.059663366  
## [11] -0.095920844 -0.022611980 0.062472223 0.069602752 -0.058618269  
## [16] 0.008539136 0.006230744 NA NA  
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## [6] -0.018583420 0.008170616 0.025421766 0.044571503 0.059663366  
## [11] -0.095920844 -0.022611980 0.062472223 0.069602752 -0.058618269  
## [16] 0.008539136 0.006230744 -0.007257488 NA  
## [1] 0.22195038 0.03017670 -0.18317084 0.27800432 0.23527763  
## [6] 0.06663344 0.24328864 -0.28937036 0.27592790 -0.09707456  
## [11] -0.26772367 -0.37811239 0.04476534 0.32133795 -0.39151603  
## [16] NA NA NA NA  
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## [6] 0.066633444 0.243288644 -0.289370363 0.275927899 -0.097074561  
## [11] -0.267723665 -0.378112388 0.044765344 0.321337949 -0.391516025  
## [16] 0.002305536 NA NA NA  
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## [6] 0.066633444 0.243288644 -0.289370363 0.275927899 -0.097074561  
## [11] -0.267723665 -0.378112388 0.044765344 0.321337949 -0.391516025  
## [16] 0.002305536 -0.013232431 NA NA  
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## [6] 0.066633444 0.243288644 -0.289370363 0.275927899 -0.097074561  
## [11] -0.267723665 -0.378112388 0.044765344 0.321337949 -0.391516025  
## [16] 0.002305536 -0.013232431 -0.011990406 NA  
## [1] 0.057673202 0.031336994 0.002866144 -0.069823517 0.006197589  
## [6] 0.035426241 -0.014595375 -0.003689189 -0.074719267 0.003286105  
## [11] -0.072373103 0.022932874 -0.011074700 0.041448574 -0.012141660  
## [16] NA NA NA NA  
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## [6] 0.035426241 -0.014595375 -0.003689189 -0.074719267 0.003286105  
## [11] -0.072373103 0.022932874 -0.011074700 0.041448574 -0.012141660  
## [16] 0.004818631 NA NA NA  
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## [6] 0.035426241 -0.014595375 -0.003689189 -0.074719267 0.003286105  
## [11] -0.072373103 0.022932874 -0.011074700 0.041448574 -0.012141660  
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## [6] 0.38591393 2.10085541 0.21109202 1.00370948 0.02766453  
## [11] 1.23831194 0.57193423 0.75076416 -0.26645811 0.10976531  
## [16] NA NA NA NA  
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## [6] 0.38591393 2.10085541 0.21109202 1.00370948 0.02766453  
## [11] 1.23831194 0.57193423 0.75076416 -0.26645811 0.10976531  
## [16] 0.33093875 NA NA NA  
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## [6] 0.38591393 2.10085541 0.21109202 1.00370948 0.02766453  
## [11] 1.23831194 0.57193423 0.75076416 -0.26645811 0.10976531  
## [16] 0.33093875 0.35585352 NA NA  
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## [6] 0.38591393 2.10085541 0.21109202 1.00370948 0.02766453  
## [11] 1.23831194 0.57193423 0.75076416 -0.26645811 0.10976531  
## [16] 0.33093875 0.35585352 0.14586815 NA  
## [1] -0.10175883 0.01347620 -0.16429917 0.10082151 -0.01030862  
## [6] 0.06821422 -0.02145072 0.08192701 0.07212909 -0.11177674  
## [11] 0.01539178 -0.03341823 0.02995790 -0.05703018 -0.01065878  
## [16] NA NA NA NA  
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## [6] 0.06821422 -0.02145072 0.08192701 0.07212909 -0.11177674  
## [11] 0.01539178 -0.03341823 0.02995790 -0.05703018 -0.01065878  
## [16] -0.01633372 NA NA NA  
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## [6] 0.06821422 -0.02145072 0.08192701 0.07212909 -0.11177674  
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## [6] 0.06821422 -0.02145072 0.08192701 0.07212909 -0.11177674  
## [11] 0.01539178 -0.03341823 0.02995790 -0.05703018 -0.01065878  
## [16] -0.01633372 0.02835129 -0.08943307 NA  
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## [6] -0.08905035 -0.22096132 0.21065967 -0.40512856 0.10651442  
## [11] 0.51137124 0.42234882 -0.11744813 -0.37088431 0.50935751  
## [16] NA NA NA NA  
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## [6] -0.08905035 -0.22096132 0.21065967 -0.40512856 0.10651442  
## [11] 0.51137124 0.42234882 -0.11744813 -0.37088431 0.50935751  
## [16] 0.05428024 NA NA NA  
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## [6] -0.08905035 -0.22096132 0.21065967 -0.40512856 0.10651442  
## [11] 0.51137124 0.42234882 -0.11744813 -0.37088431 0.50935751  
## [16] 0.05428024 -0.01819270 NA NA  
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## [6] -0.08905035 -0.22096132 0.21065967 -0.40512856 0.10651442  
## [11] 0.51137124 0.42234882 -0.11744813 -0.37088431 0.50935751  
## [16] 0.05428024 -0.01819270 -0.06679850 NA  
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## [6] -0.36817358 -1.90788483 -0.17772689 -0.91382957 -0.04811831  
## [11] -1.18992063 -0.54121398 -0.67154029 0.19919529 -0.03638512  
## [16] NA NA NA NA  
## [1] 0.65694212 -0.15062738 0.31585999 -0.45690599 -0.10306438  
## [6] -0.36817358 -1.90788483 -0.17772689 -0.91382957 -0.04811831  
## [11] -1.18992063 -0.54121398 -0.67154029 0.19919529 -0.03638512  
## [16] -0.32743441 NA NA NA  
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## [6] -0.36817358 -1.90788483 -0.17772689 -0.91382957 -0.04811831  
## [11] -1.18992063 -0.54121398 -0.67154029 0.19919529 -0.03638512  
## [16] -0.32743441 -0.29577091 NA NA  
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## [6] -0.36817358 -1.90788483 -0.17772689 -0.91382957 -0.04811831  
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## [16] -0.32743441 -0.29577091 -0.13174467 NA  
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## [11] 0.008702476 -0.035251299 -0.047632513 0.029829163 0.031435597  
## [16] NA NA NA NA  
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## [16] -0.028728623 NA NA NA  
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## [16] NA NA NA NA  
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## [6] -0.0249112182 0.0166766538 -0.0402574976 0.0119305136 -0.0388480850  
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## [11] 0.0261040066 0.0374787171 0.0648299806 0.0524948399 -0.0339400408  
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## [16] 0.022620946 0.014535665 0.015209905 NA  
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## [16] NA NA NA NA  
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## [11] -0.050900330 -0.026075785 0.008813934 0.004600136 -0.065598809  
## [16] 0.008325350 NA NA NA  
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## [6] 0.007952274 -0.005328934 0.075639762 0.048081188 -0.037924561  
## [11] -0.050900330 -0.026075785 0.008813934 0.004600136 -0.065598809  
## [16] 0.008325350 -0.047405282 NA NA  
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## [11] -0.050900330 -0.026075785 0.008813934 0.004600136 -0.065598809  
## [16] 0.008325350 -0.047405282 -0.021994187 NA  
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## [11] 0.225937825 -0.016214913 -0.052885995 -0.053900329 0.196514488  
## [16] NA NA NA NA  
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## [11] 0.225937825 -0.016214913 -0.052885995 -0.053900329 0.196514488  
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## [16] 0.018065155 0.011210591 0.034503772 NA  
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## [6] -0.13932987 -0.07103968 -0.49881014 -0.42399898 0.24063815  
## [11] -0.04379428 -0.03367981 -0.16863801 0.47328920 -0.04482262  
## [16] NA NA NA NA  
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## [6] -0.13932987 -0.07103968 -0.49881014 -0.42399898 0.24063815  
## [11] -0.04379428 -0.03367981 -0.16863801 0.47328920 -0.04482262  
## [16] 0.12330120 NA NA NA  
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## [6] -0.13932987 -0.07103968 -0.49881014 -0.42399898 0.24063815  
## [11] -0.04379428 -0.03367981 -0.16863801 0.47328920 -0.04482262  
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## [6] -0.13932987 -0.07103968 -0.49881014 -0.42399898 0.24063815  
## [11] -0.04379428 -0.03367981 -0.16863801 0.47328920 -0.04482262  
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## [1] -0.25606864 0.01696098 -0.21639189 0.50631301 -0.17688374  
## [6] 0.08883366 0.04011712 0.46027772 0.45767946 -0.07855737  
## [11] -0.23097298 0.08206179 0.20126247 -0.28789179 -0.04992930  
## [16] NA NA NA NA  
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## [6] 0.08883366 0.04011712 0.46027772 0.45767946 -0.07855737  
## [11] -0.23097298 0.08206179 0.20126247 -0.28789179 -0.04992930  
## [16] 0.09587865 NA NA NA  
## [1] -0.25606864 0.01696098 -0.21639189 0.50631301 -0.17688374  
## [6] 0.08883366 0.04011712 0.46027772 0.45767946 -0.07855737  
## [11] -0.23097298 0.08206179 0.20126247 -0.28789179 -0.04992930  
## [16] 0.09587865 0.11025298 NA NA  
## [1] -0.25606864 0.01696098 -0.21639189 0.50631301 -0.17688374  
## [6] 0.08883366 0.04011712 0.46027772 0.45767946 -0.07855737  
## [11] -0.23097298 0.08206179 0.20126247 -0.28789179 -0.04992930  
## [16] 0.09587865 0.11025298 0.07347911 NA

library(sqldf)

## Loading required package: gsubfn

## Loading required package: proto

## Loading required package: RSQLite

## Warning: package 'RSQLite' was built under R version 3.3.2

cal\_date<-as.data.frame(cal\_date[16:19])  
data\_ts<-sqldf('select \* from data\_ts where calendardate in cal\_date')

## Loading required package: tcltk

## Warning: Quoted identifiers should have class SQL, use DBI::SQL() if the  
## caller performs the quoting.

#Predicting Expected Log Returns - Named as Target  
nms <- sample(LETTERS,sample(1:10))  
target\_return<-as.data.frame(t(matrix(nrow=length(nms),ncol=0,dimnames=list(nms))))  
target<-0  
gg <-0  
data\_ts$target <-c()  
for (i in 1:dim(data\_ts)[1]){  
 a <- ifelse(data\_ts$calendardate[i] == "2014-12-31", 16, ifelse(data\_ts$calendardate[i] == "2015-03-31",17, ifelse(data\_ts$calendardate[i] == "2015-06-30", 18, 19)))  
 for (j in 1:20){  
 gg<- data\_ts[i,j]\*tr[a,(j)]  
 target = target + gg  
 }  
 gg= 0  
 data\_ts$target[i] <- log(target + tr[a,1])  
}

#Storing the dataset into data\_test  
data\_test <- data\_ts  
data\_test <- na.omit(data\_test)  
data\_test$log\_return\_price <- log(data\_test$return\_price)  
  
data\_test <- data\_test[order(data\_test$target),]  
row.names(data\_test)= (1:nrow(data\_test))  
  
#Dividing the Dataset into 5 buckets  
  
#Before that removing na's  
data\_test <- na.omit(data\_test)  
  
#Creating the Column grade for creating buckets based on the order  
#of epected return Values i.e. target and initializing with a value  
data\_test$grade <- "A"  
  
#Now creating the buckets  
data\_test$grade[1:(dim(data\_test)[1]/5)] <- "A"  
data\_test$grade[(dim(data\_test)[1]/5)+1:((dim(data\_test)[1]/5)\*2)] <- "B"  
data\_test$grade[(((dim(data\_test)[1]/5)\*2)+1):((dim(data\_test)[1]/5)\*3)] <- "C"  
data\_test$grade[(((dim(data\_test)[1]/5)\*3)+1):((dim(data\_test)[1]/5)\*4)] <- "D"  
data\_test$grade[(((dim(data\_test)[1]/5)\*4)+1):dim(data\_test)[1]] <- "E"  
  
#Creating New DataFrame df\_grade for computing the mean  
  
df\_grade <- as.data.frame(t(matrix(nrow=length(nms),ncol=0,dimnames=list(nms))))  
  
names(df\_grade)[1] <- "Flag"  
names(df\_grade)[2] <- "Mean\_Return"  
  
  
df\_grade[1,1] <- "A"  
df\_grade[2,1] <- "B"  
df\_grade[3,1] <- "C"  
df\_grade[4,1] <- "D"  
df\_grade[5,1] <- "E"  
  
#Calculating mean for Actual Return  
df\_grade$Mean\_Return <- c(mean(data\_test$log\_return\_price[data\_test$grade == "A"]),  
 mean(data\_test$log\_return\_price[data\_test$grade == "B"]),  
 mean(data\_test$log\_return\_price[data\_test$grade == "C"]),  
 mean(data\_test$log\_return\_price[data\_test$grade == "D"]),  
 mean(data\_test$log\_return\_price[data\_test$grade == "E"])  
)  
  
#Calculating mean for Expected Return  
df\_grade$Mean\_Target <- c(mean(data\_test$target[data\_test$grade == "A"]),  
 mean(data\_test$target[data\_test$grade == "B"]),  
 mean(data\_test$target[data\_test$grade == "C"]),  
 mean(data\_test$target[data\_test$grade == "D"]),  
 mean(data\_test$target[data\_test$grade == "E"])  
)  
  
#Keeping only the Grade, Mean\_Return and Mean\_Target  
df\_grade <- subset(df\_grade, select = c(Flag, Mean\_Return, Mean\_Target))  
print(df\_grade)

## Flag Mean\_Return Mean\_Target  
## 1 A 0.005224148 -0.2243830  
## 2 B 0.024854527 0.8100563  
## 3 C 0.004697563 1.1372756  
## 4 D -0.015074969 1.4232331  
## 5 E 0.008391145 1.7689001