

Analysis

Import the Malawi data.

Organize the variable names and ready for analysis.

```
# levels
levels<-c("ipczone","TA","clust")

# variables
weather<-c("L12raincytot","L12day1rain","L12maxdays","floodmax")
access<-c("lag_price","lag_thinn")
asset1 <-c("roof","cells_own")
land<-c("percent_ag","elevation","nutri_reten_constrained")
distance<-c("dist_road","dist_admarc")
demo<-c("hhsize","hh_age","hh_gender","asset")

model3_variables<-c(weather,access,asset1,land,distance,demo)
model2_variables<-c(weather,access,asset1,land,distance)
model1_variables<-c(weather,access,land,distance)

# goal : combine variables at different levels using pastes
# output: variables lists at different levels, TA_vars, ipczone vars, etc.

for (level in levels){
  # assign levels of variables group
  group_var_name<-paste(level,"vars",sep="_")
  assign(group_var_name,c())

  for(var in model3_variables){
    temp<-paste(level,var,sep = "_")
    new<-append(get(group_var_name),temp)
    assign(group_var_name,new)
  }
}
```

First try the linear functions Create the formulas using the formula_compose function.

```
rcsi_formula<-formula_compose("RCSI",clust_vars)
logFCS_formula<-formula_compose("logFCS",clust_vars)
HDDS_formula<-formula_compose("HDDS",clust_vars)

rcsi_predictions<-linear_fit(rcsi_formula,ihs2010,ihs2013)
# lm_train_measure<-postResample(rcsi_predictions$pred_train,ihs2010$RCSI)
lm_test_measure<-postResample(rcsi_predictions$pred_test,ihs2013$RCSI)
lm_test_measure

##          RMSE      Rsquared        MAE
## 7.07641265 0.01254163 5.52598695

# scatter.smooth(rcsi_predictions$pred_test,ihs2013$RCSI)

logFCS_predictions<-linear_fit(logFCS_formula,ihs2010,ihs2013)
lm_test_measure<-postResample(rcsi_predictions$pred_test,ihs2013$logFCS)
lm_test_measure
```

```
##          RMSE      Rsquared        MAE
## 2.47188996 0.09126124 2.11332725
# scatter.smooth(logFCS_predictions$pred_test, ihs2013$logFCS)

HDDS_predictions<-linear_fit(HDDS_formula,ihs2010,ihs2013)
lm_test_measure<-postResample(rcsi_predictions$pred_test,ihs2013$HDDS)
lm_test_measure

##          RMSE      Rsquared        MAE
## 2.38812209 0.08306447 1.84598055
# scatter.smooth(HDDS_predictions$pred_test, ihs2013$HDDS)
```