

Testing XGBOOST in raw MLIV results

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Setup

Taking ATE queen as we saw a problem specifically with that queen.

This is CA, continuous, small set, ATE queen, 1000 train set.

```
`ATE_queen_predicted_IATES` <- readRDS("/data/share/cdi/MLIV/Data/Big_Jobs/ca/continuous/train_1000/sma  
df = `ATE_queen_predicted_IATES`[["predictedtau"]]
```

Separating each model into a dataframe.

```
third_dim_names <- dimnames(df)[[3]]  
  
# Initialize an empty list to store all data frames  
model_dataframes <- list()  
  
# Loop through each model name in the third dimension and create a data frame  
for (model in third_dim_names) {  
  # Extract the slice for each model and convert it into a data frame  
  model_dataframes[[model]] <- as.data.frame(df[ , , which(third_dim_names == model)])  
}  
  
# Accessing each model's data frame  
df_ATE <- model_dataframes[["ATE"]]  
df_OLS_S <- model_dataframes[["OLS S"]]  
df_RF_INF <- model_dataframes[["RF INF"]]  
df_RF_T <- model_dataframes[["RF T"]]  
df_RF_MOM_IPW <- model_dataframes[["RF MOM IPW"]]  
df_RF_MOM_DR <- model_dataframes[["RF MOM DR"]]  
df_CF <- model_dataframes[["CF"]]  
df_CF_LC <- model_dataframes[["CF LC"]]  
df_CDML <- model_dataframes[["CDML"]]  
df_LASSO_INF <- model_dataframes[["LASSO INF"]]  
df_LASSO_T <- model_dataframes[["LASSO T"]]  
df_LASSO_MOM_IPW <- model_dataframes[["LASSO MOM IPW"]]
```

```

df_LASSO_MOM_DR <- model_dataframes[["LASSO MOM DR"]]
df_LASSO_MCM <- model_dataframes[["LASSO MCM"]]
df_LASSO_MCM_EA <- model_dataframes[["LASSO MCM EA"]]
df_LASSO_R <- model_dataframes[["LASSO R"]]
df_XGBOOST_S <- model_dataframes[["XGBOOST S"]]
df_XGBOOST_R <- model_dataframes[["XGBOOST R"]]
df_BART_T <- model_dataframes[["BART T"]]
df_BART_S <- model_dataframes[["BART S"]]

```

Predicted Tau for each Obs (averaged across 100 runs)

We have 10000 obs and for each 100 runs. Let's plot 10000 obs averaging across runs.

```

# Loop through each model in the list and plot the average predictions
for (model in names(model_dataframes)) {

  # Get the data frame for the current model
  df_model <- model_dataframes[[model]]

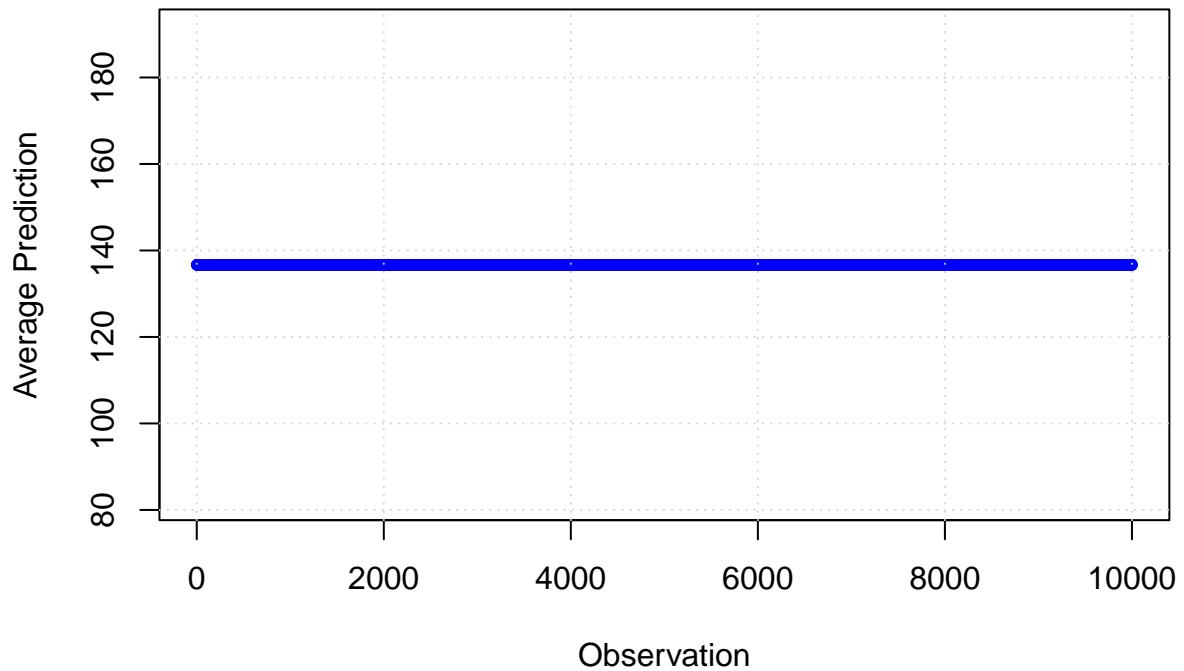
  # Calculate the average of the 100 simulation runs for each observation (column)
  average_predictions <- colMeans(df_model)

  # Plot the 10,000 observations
  plot(
    average_predictions,
    type = "p",
    pch = 20,
    col = "blue",
    main = paste("Average Predictions for", model, "Across 100 Simulation Runs"),
    xlab = "Observation",
    ylab = "Average Prediction"
  )

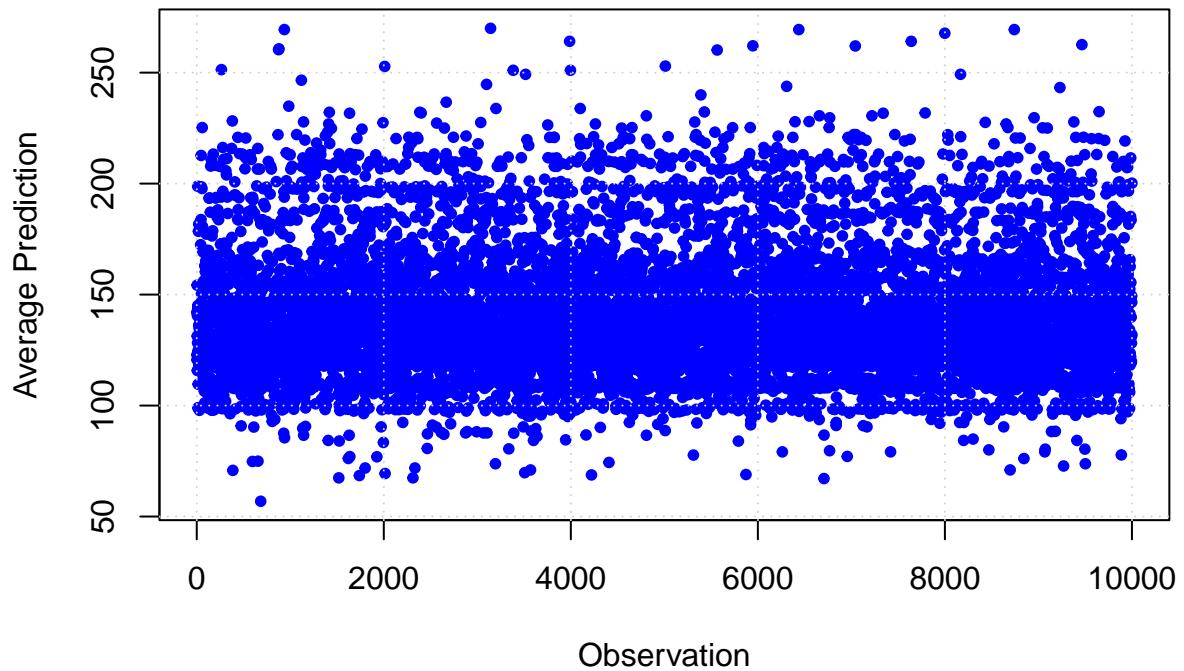
  # Optionally, add a grid to make it easier to identify points
  grid()
}

```

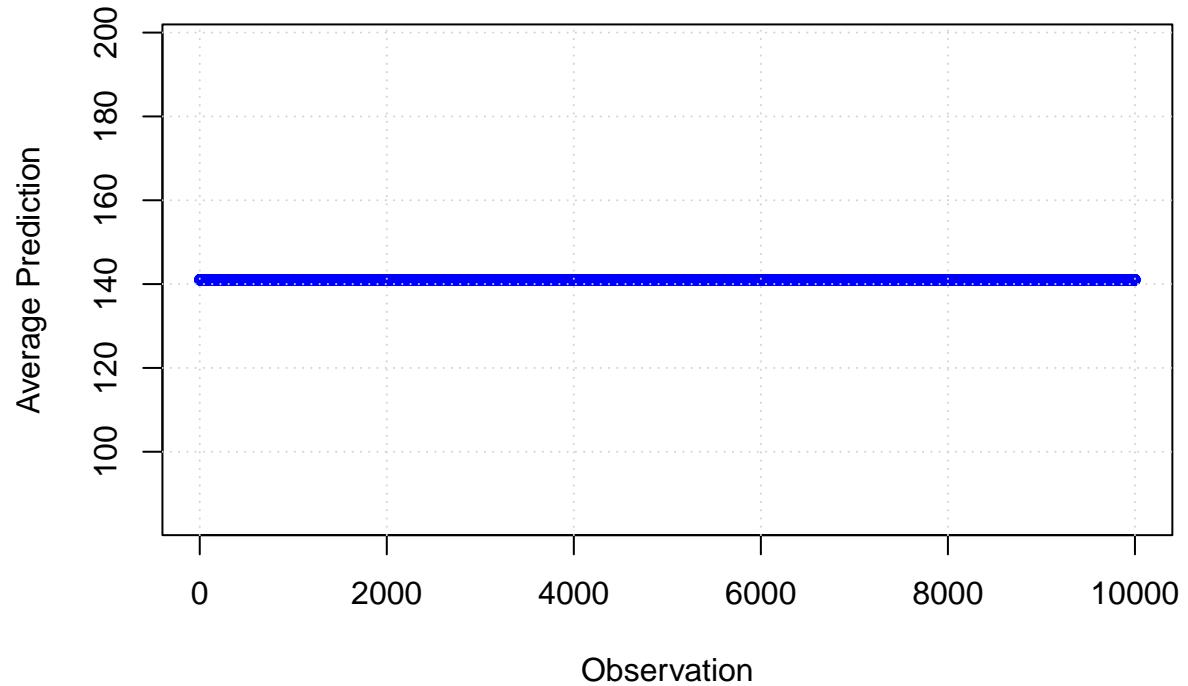
Average Predictions for ATE Across 100 Simulation Runs



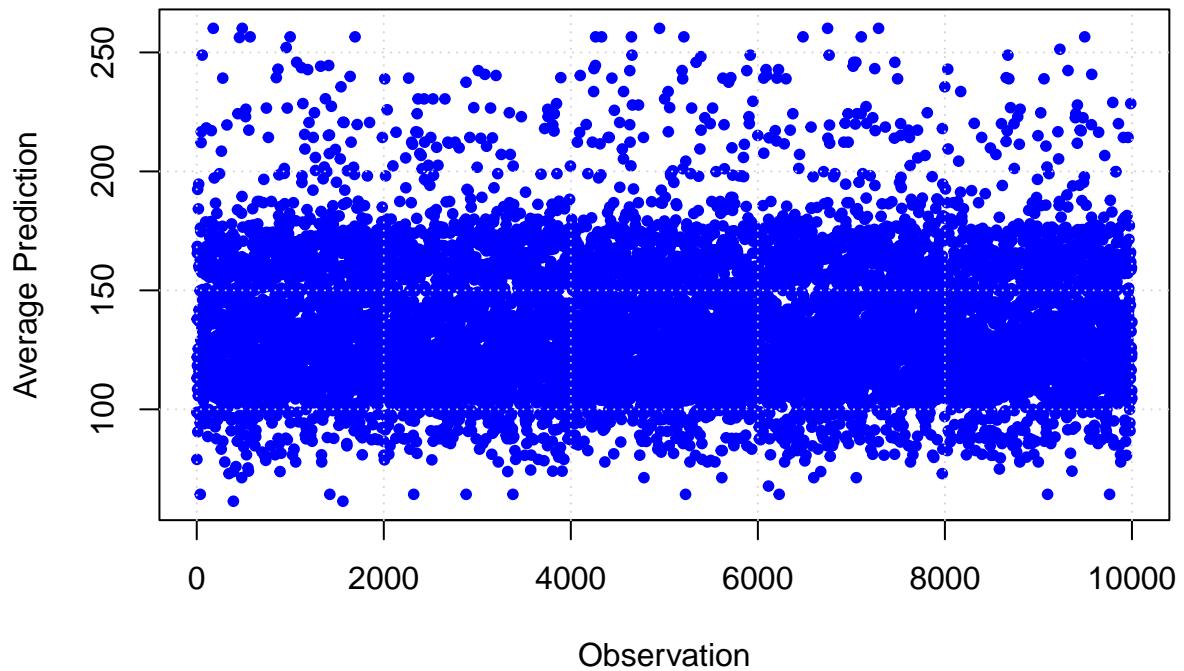
Average Predictions for OLS S Across 100 Simulation Runs



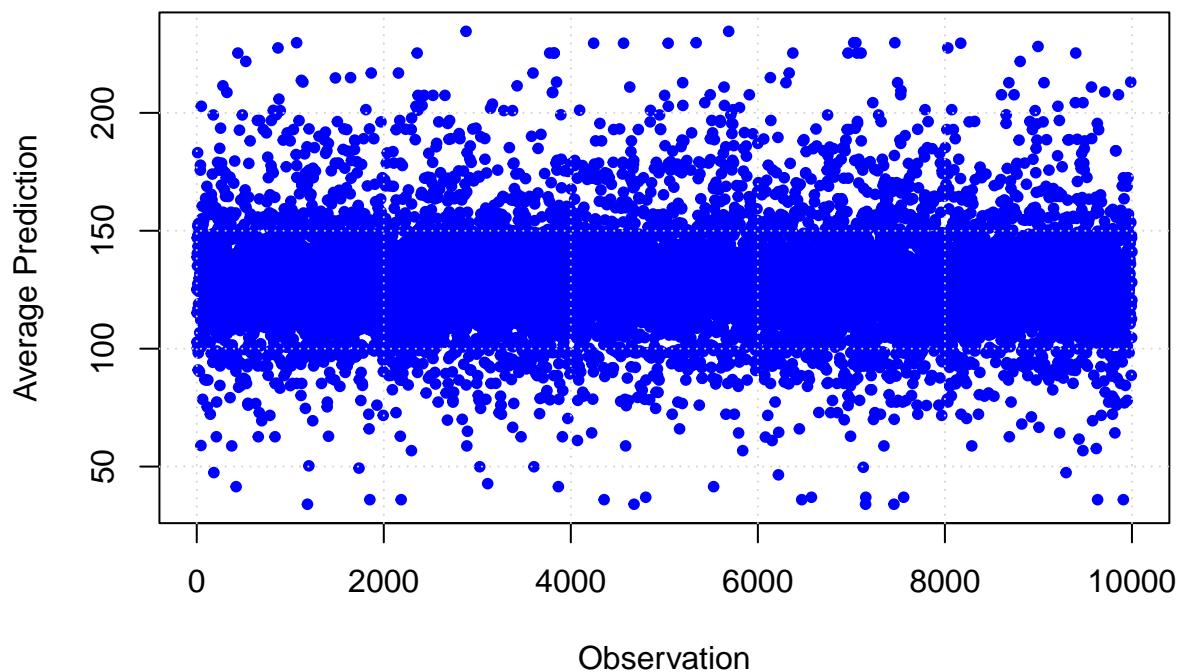
Average Predictions for RF INF Across 100 Simulation Runs



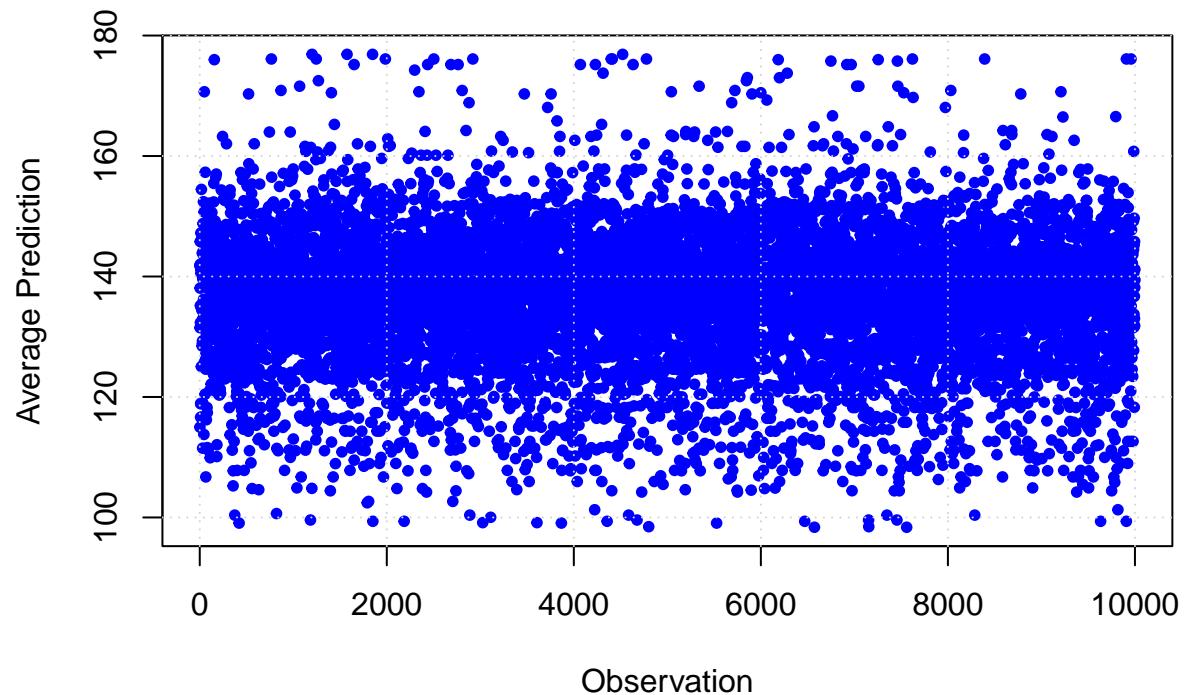
Average Predictions for RF T Across 100 Simulation Runs



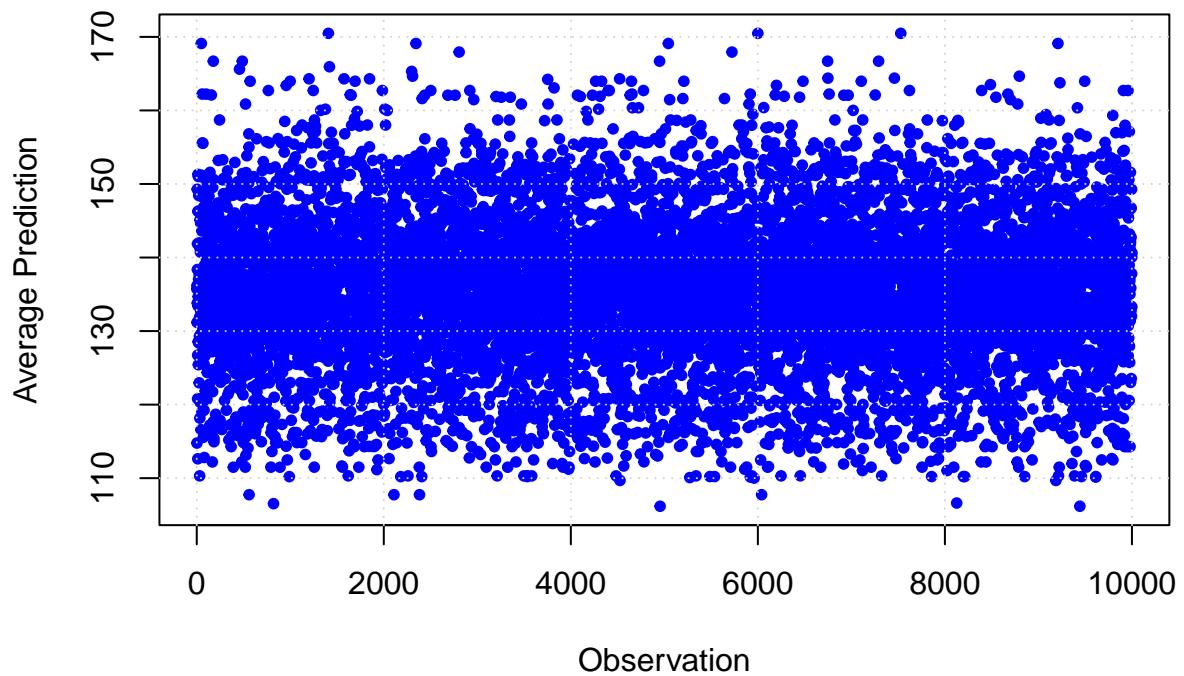
Average Predictions for RF MOM IPW Across 100 Simulation Runs



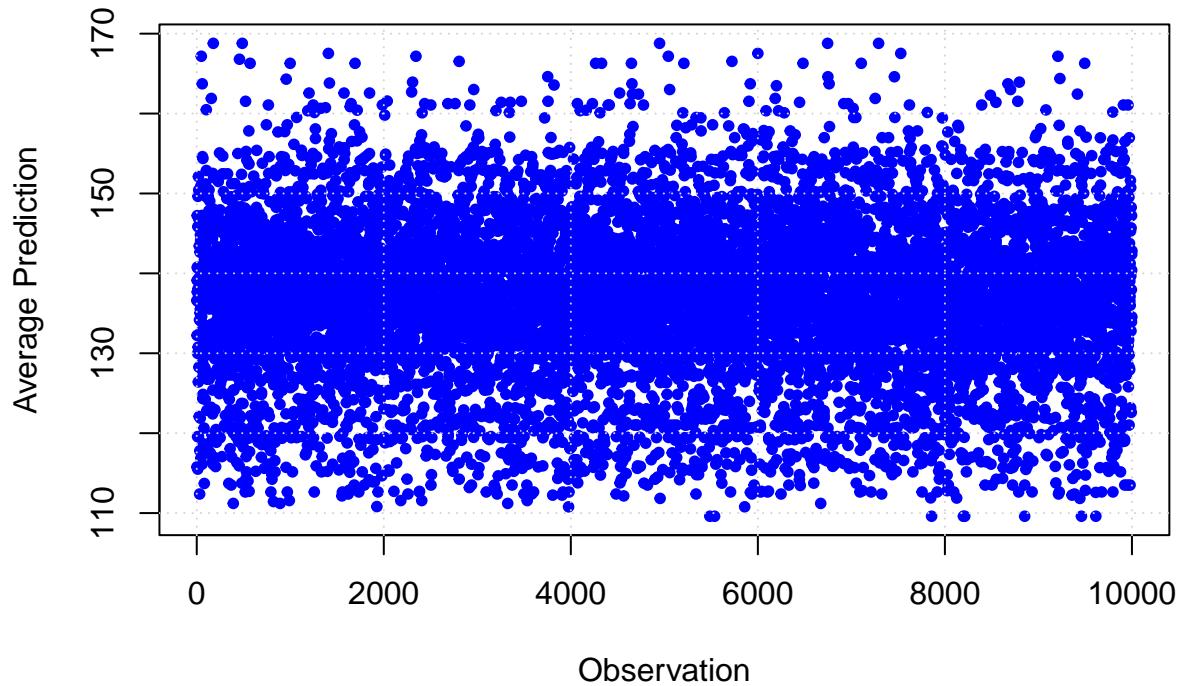
Average Predictions for RF MOM DR Across 100 Simulation Runs



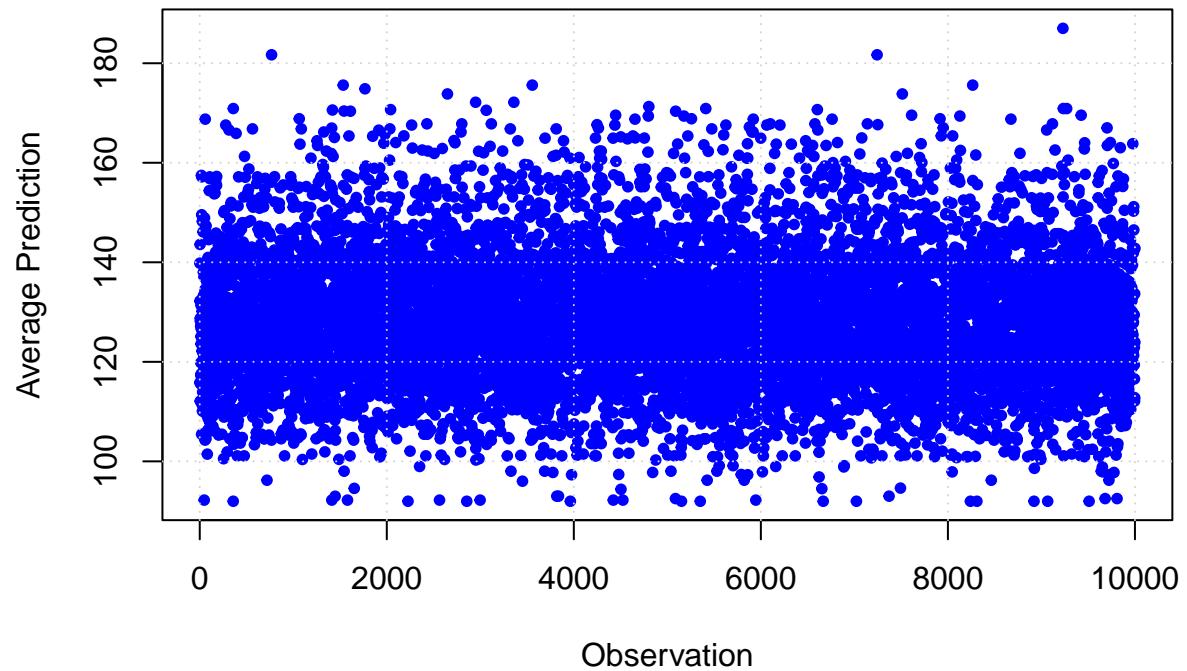
Average Predictions for CF Across 100 Simulation Runs



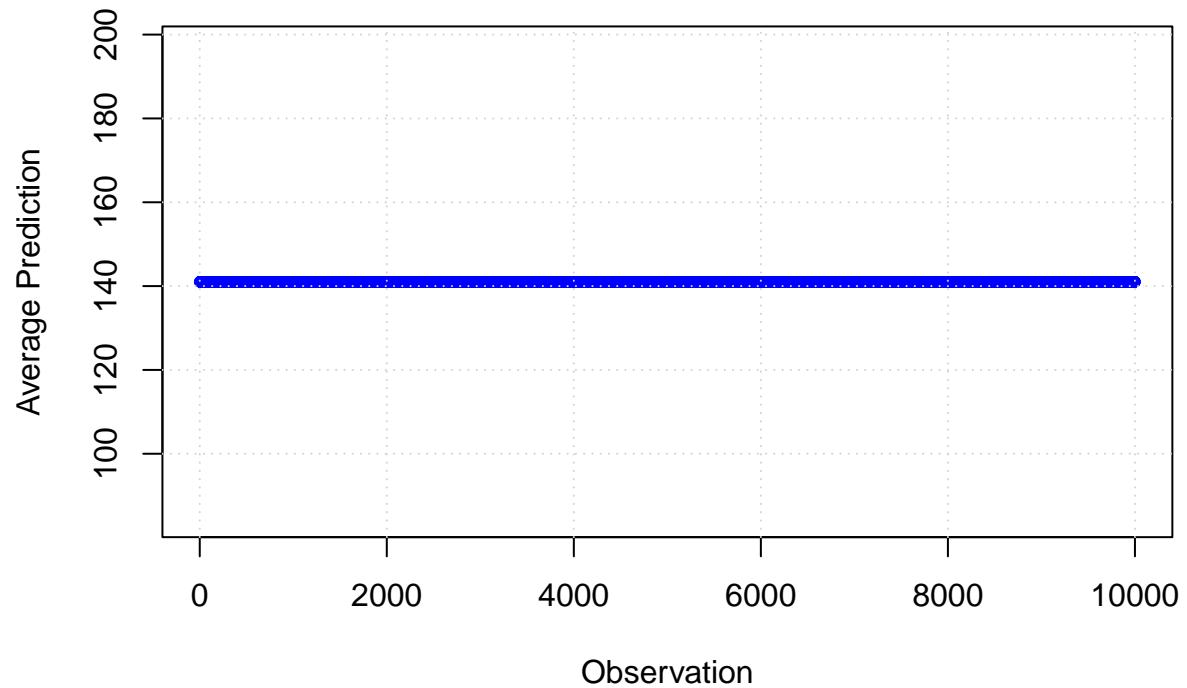
Average Predictions for CF LC Across 100 Simulation Runs



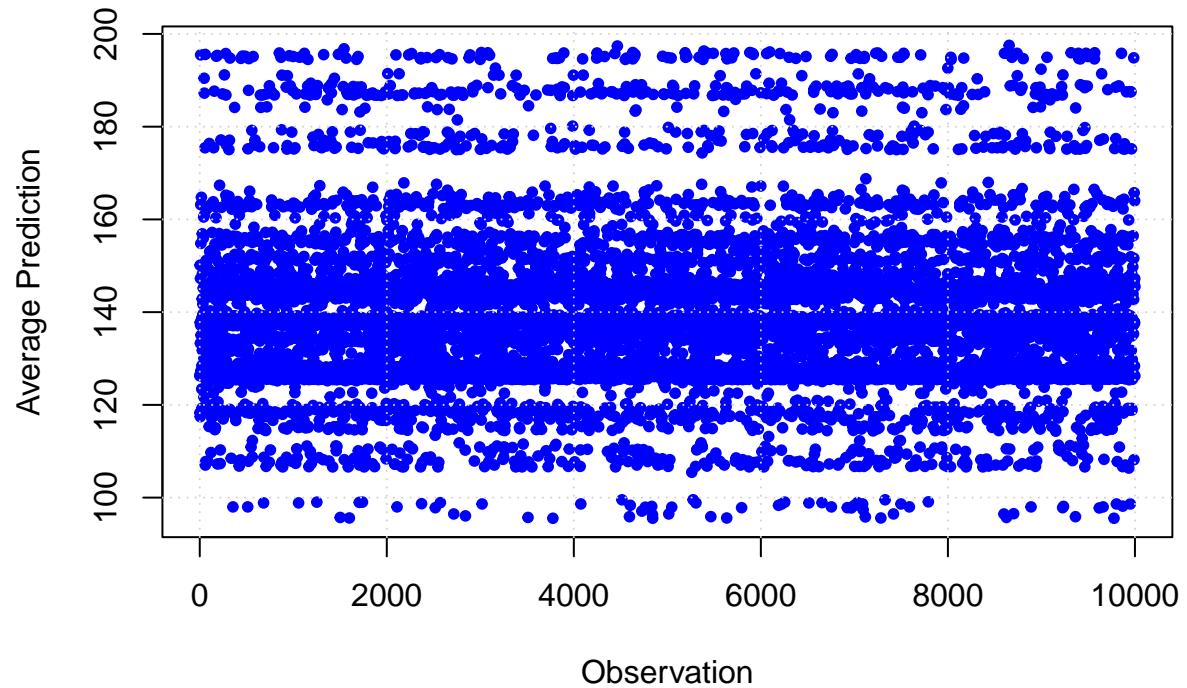
Average Predictions for CDML Across 100 Simulation Runs



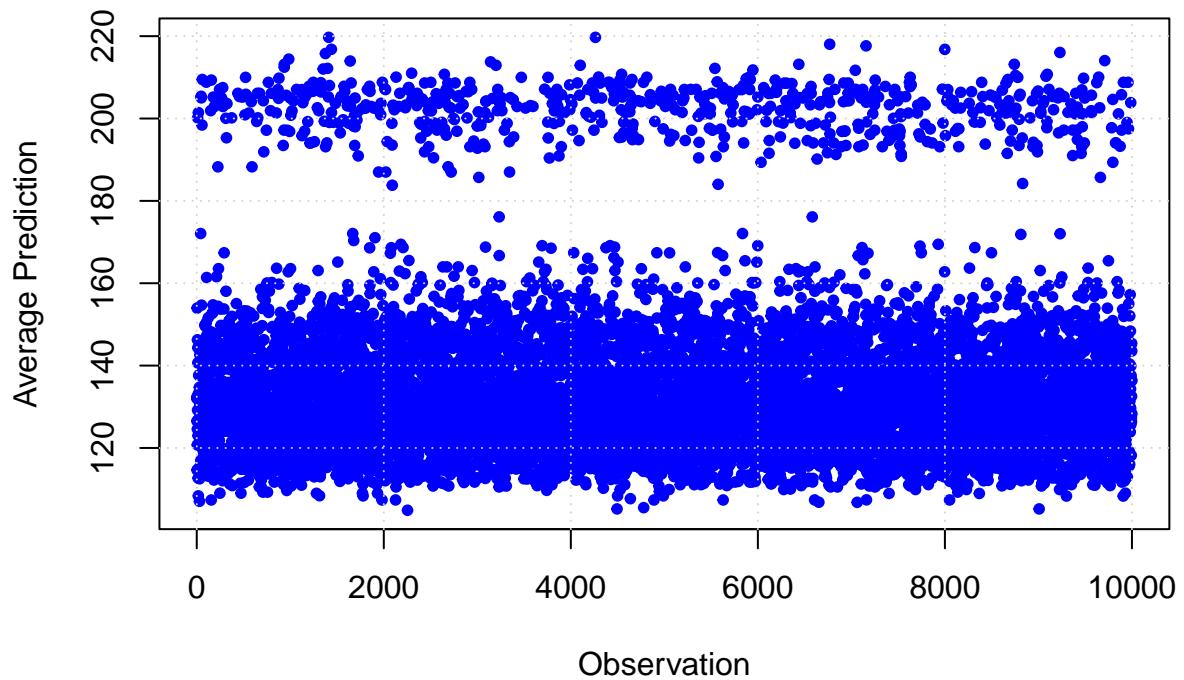
Average Predictions for LASSO INF Across 100 Simulation Runs



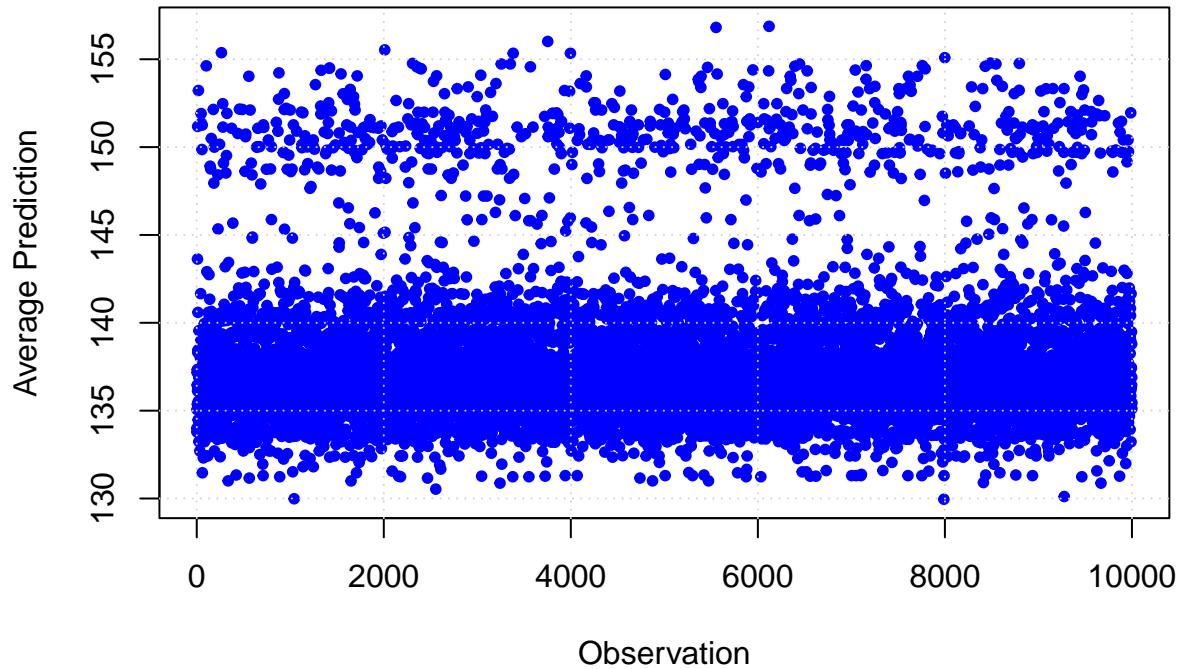
Average Predictions for LASSO T Across 100 Simulation Runs



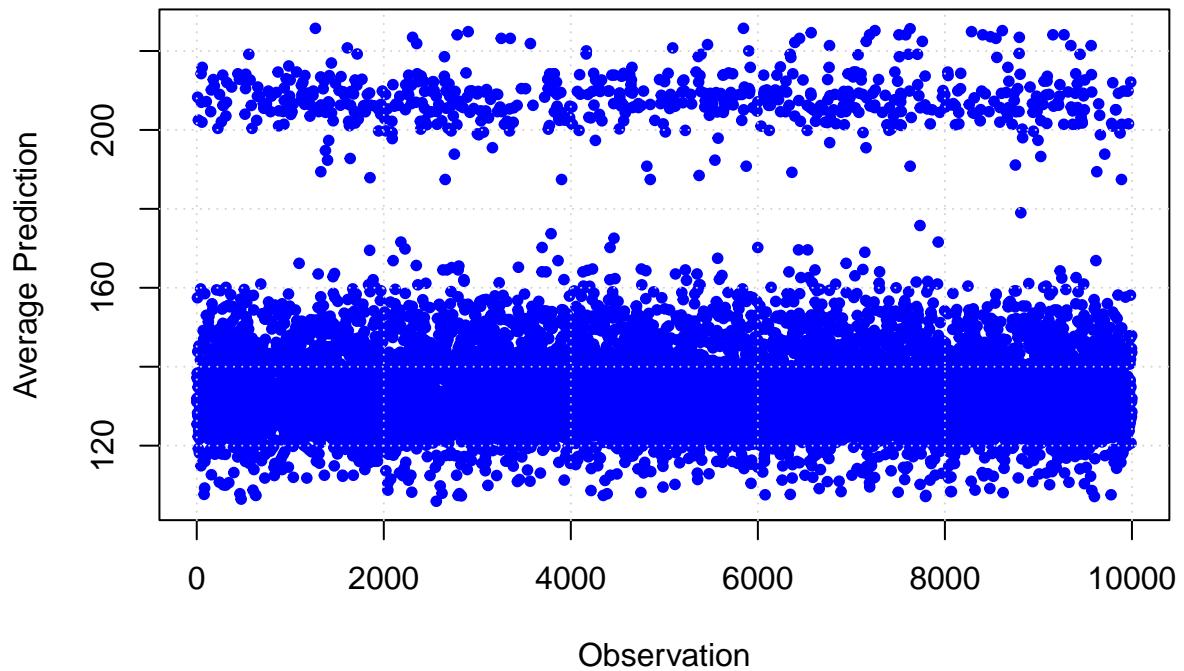
Average Predictions for LASSO MOM IPW Across 100 Simulation Runs



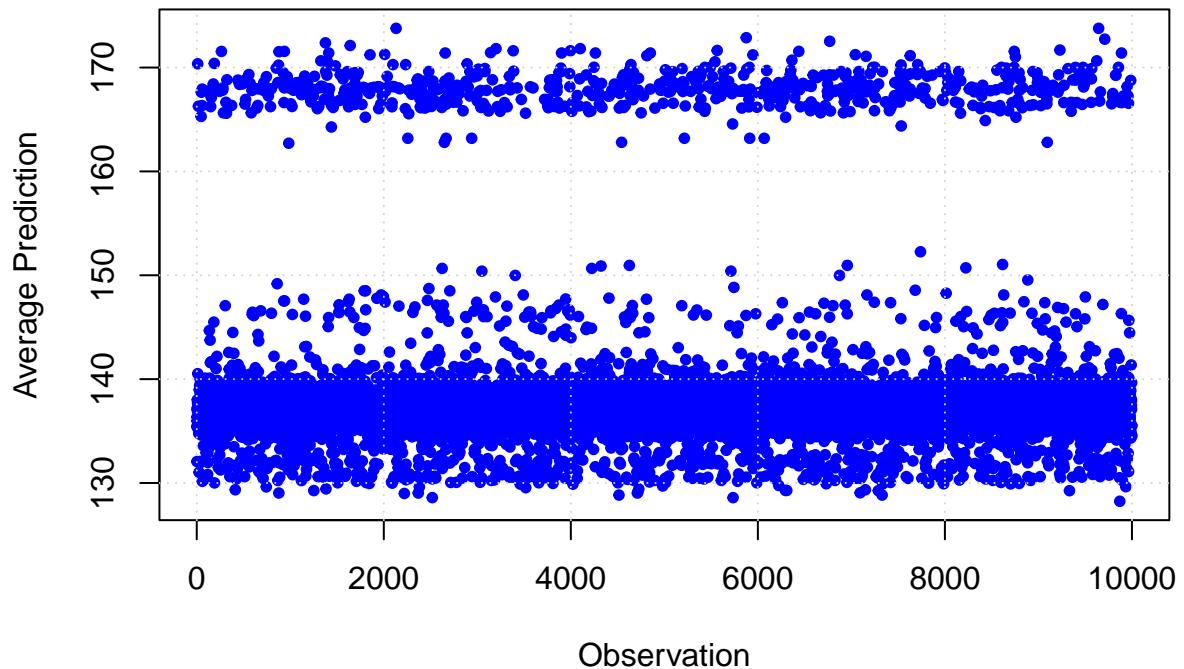
Average Predictions for LASSO MOM DR Across 100 Simulation Runs



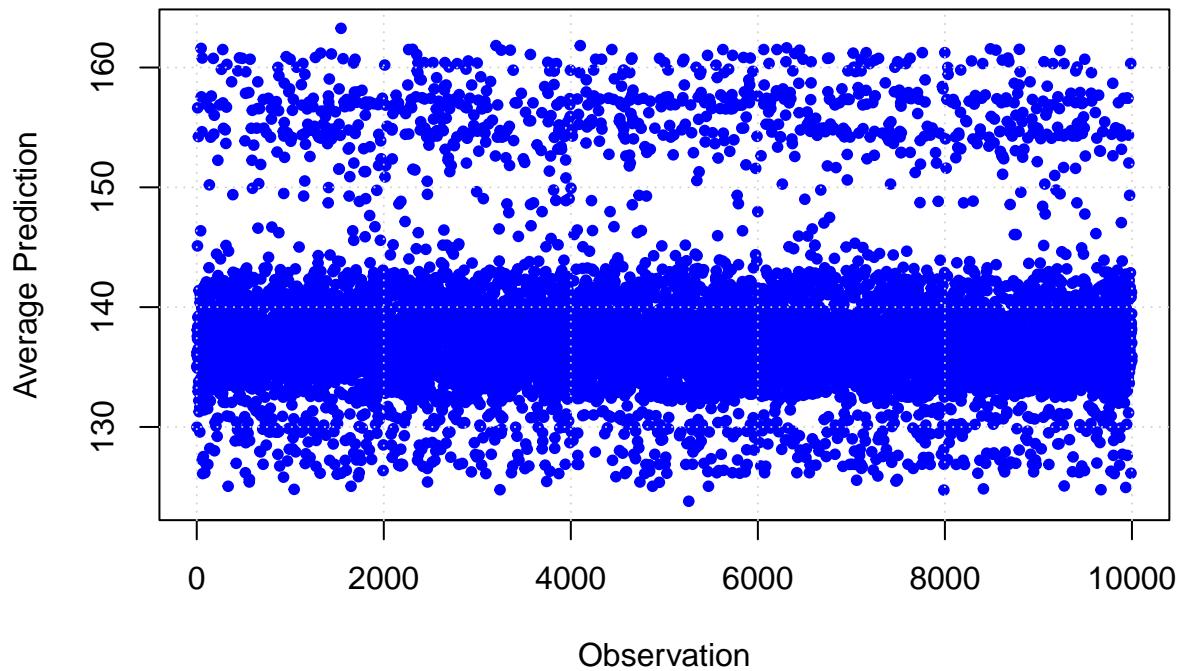
Average Predictions for LASSO MCM Across 100 Simulation Runs



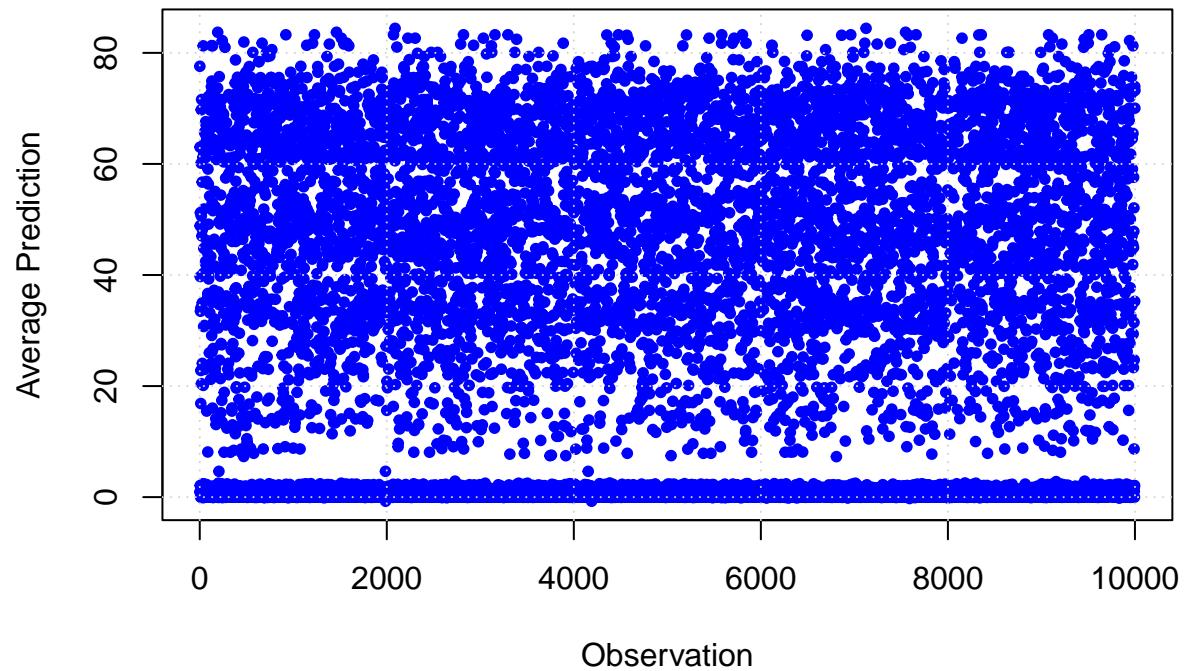
Average Predictions for LASSO MCM EA Across 100 Simulation Runs



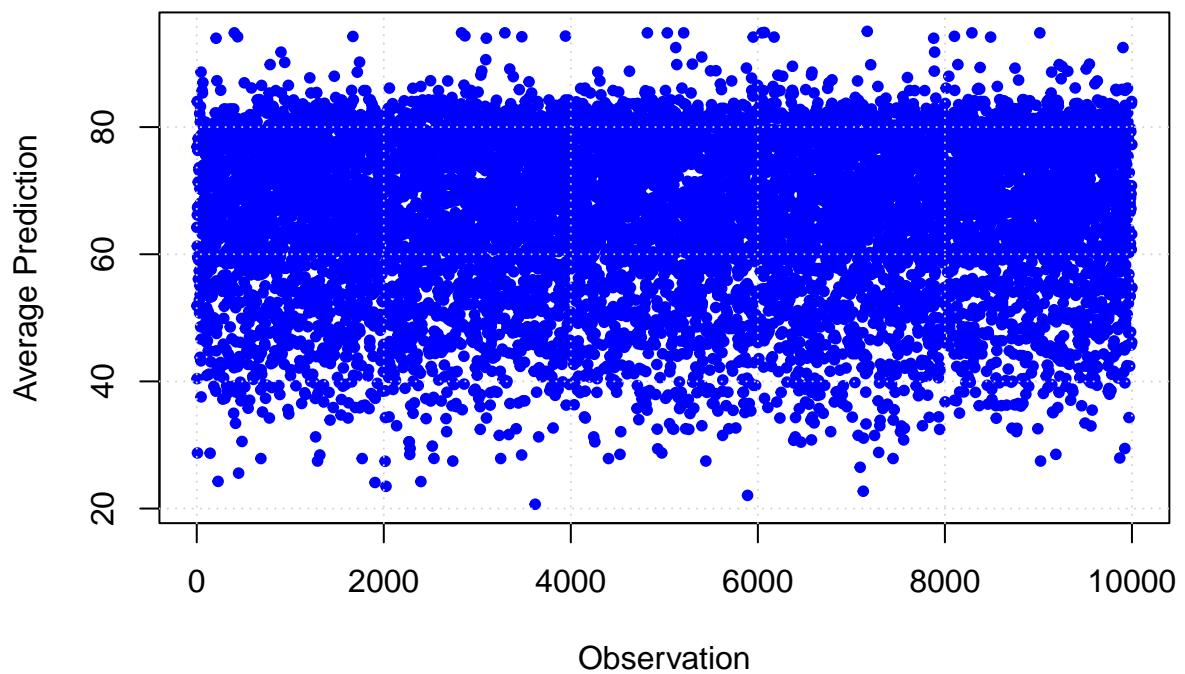
Average Predictions for LASSO R Across 100 Simulation Runs



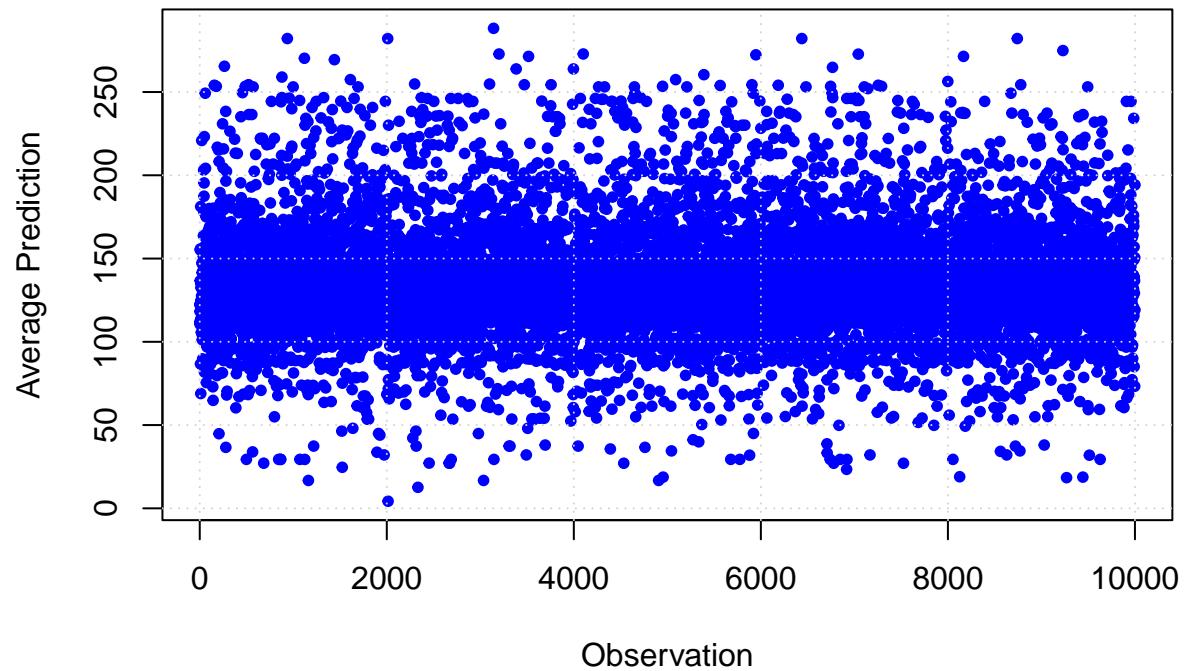
Average Predictions for XGBOOST S Across 100 Simulation Runs



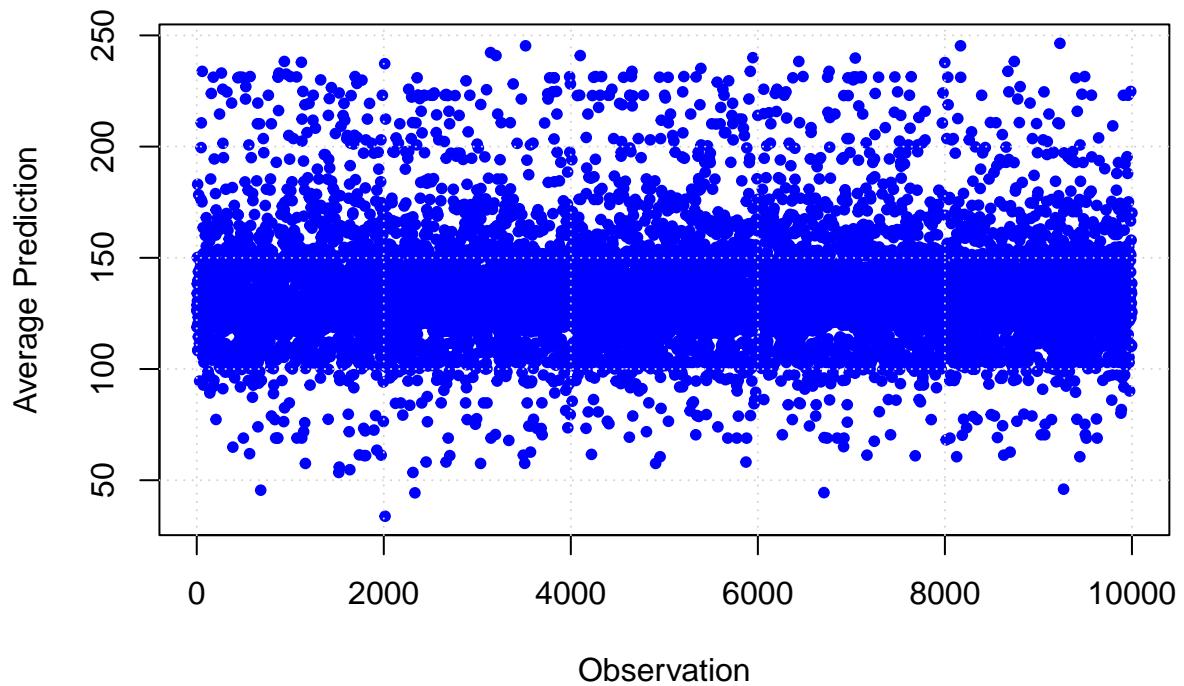
Average Predictions for XGBOOST R Across 100 Simulation Runs



Average Predictions for BART T Across 100 Simulation Runs



Average Predictions for BART S Across 100 Simulation Runs



XGBOOSTs are low? They are predicting 0s and up to 80 while OLS 100 to 200? ATE and INF are at 140 which makes sense. Some lassos are interesting too, they have two distinct lines.