

Plotting_Betas

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```
load("../Rdata_Files/Completed_df.Rda")
load("../Completed_df_2.Rda")
Completed_df_New <- Completed_df %>% full_join(Completed_df_2) %>% mutate(`Random Effects` = replace(`Random Effects`, is.na(`Random Effects`), "High"))

## Joining, by = c("simulation", "Limit fraction", "Slope", "Std", "Method", "Intercept", "Beta", "Intercept")

save(Completed_df_New, file = "../Rdata_Files/Completed_df_New.Rda")

betas <- Completed_df_New %>% filter(Method != "True") %>% mutate(Slope_Perc = ifelse(Slope < 0.01, "1%", "5%"))

tobit_betas_high <- betas %>%
  filter(Method == "Tobit") %>%
  select(-(Method)) %>%
  filter(Std == 1.4) %>%
  filter(`Random Effects` == "High")

museum_betas_high <- betas %>%
  filter(Method == "Museum") %>%
  select(-(Method)) %>%
  filter(Std == 1.4) %>%
  filter(`Random Effects` == "High")

betas_spread_high <- tobit_betas_high %>%
  mutate(Museum_Beta = museum_betas_high$Beta)

Plot_High_Variance <- betas_spread_high %>% ggplot(aes(x=Beta, y=Museum_Beta)) +
  facet_grid(Slope_Perc ~ `Limit fraction`) +
  geom_point() +
  geom_hline(data = data.frame(Slope_Perc="1%", y=log(1.01)), mapping=aes(yintercept=y)) +
  geom_vline(data = data.frame(Slope_Perc="1%", x=log(1.01)), mapping=aes(xintercept=x)) +
  geom_hline(data = data.frame(Slope_Perc="5%", y=log(1.05)), mapping=aes(yintercept=y)) +
  geom_vline(data = data.frame(Slope_Perc="5%", x=log(1.05)), mapping=aes(xintercept=x)) +
  labs(caption = "Figure 2: Plotting the estimated slopes for the Museum model and Tobit model against the Limit fraction, having the variance of both error terms set to high.")

save(Plot_High_Variance, file = "Plot_High_Variance.Rda")

tobit_betas_low <- betas %>%
  filter(Method == "Tobit") %>%
  select(-(Method)) %>%
  filter(Std == 0.05) %>%
```

```

filter(`Random Effects` == "Low")

museum_betas_low <- betas %>%
  filter(Method == "Museum") %>%
  select(-(Method)) %>%
  filter(Std == 0.05) %>%
  filter(`Random Effects` == "Low")

betas_spread_low <- tobit_betas_low %>%
  mutate(Museum_Beta = museum_betas_low$Beta)

Plot_low_Variance <- betas_spread_low %>% ggplot(aes(x=Beta, y=Museum_Beta)) +
  facet_grid(Slope_Perc ~ `Limit fraction`) +
  geom_point() +
  geom_hline(data = data.frame(Slope_Perc="1%", y=log(1.01)), mapping=aes(yintercept=y)) +
  geom_vline(data = data.frame(Slope_Perc="1%", x=log(1.01)), mapping=aes(xintercept=x)) +
  geom_hline(data = data.frame(Slope_Perc="5%", y=log(1.05)), mapping=aes(yintercept=y)) +
  geom_vline(data = data.frame(Slope_Perc="5%", x=log(1.05)), mapping=aes(xintercept=x)) +
  labs(caption = "Figure 3: Plotting the estimated slopes for the Museum model and Tobit model against c
having the variance of both error terms set to low.")

save(Plot_low_Variance, file = "Plot_low_Variance.Rda")

Plot_low_Variance

```

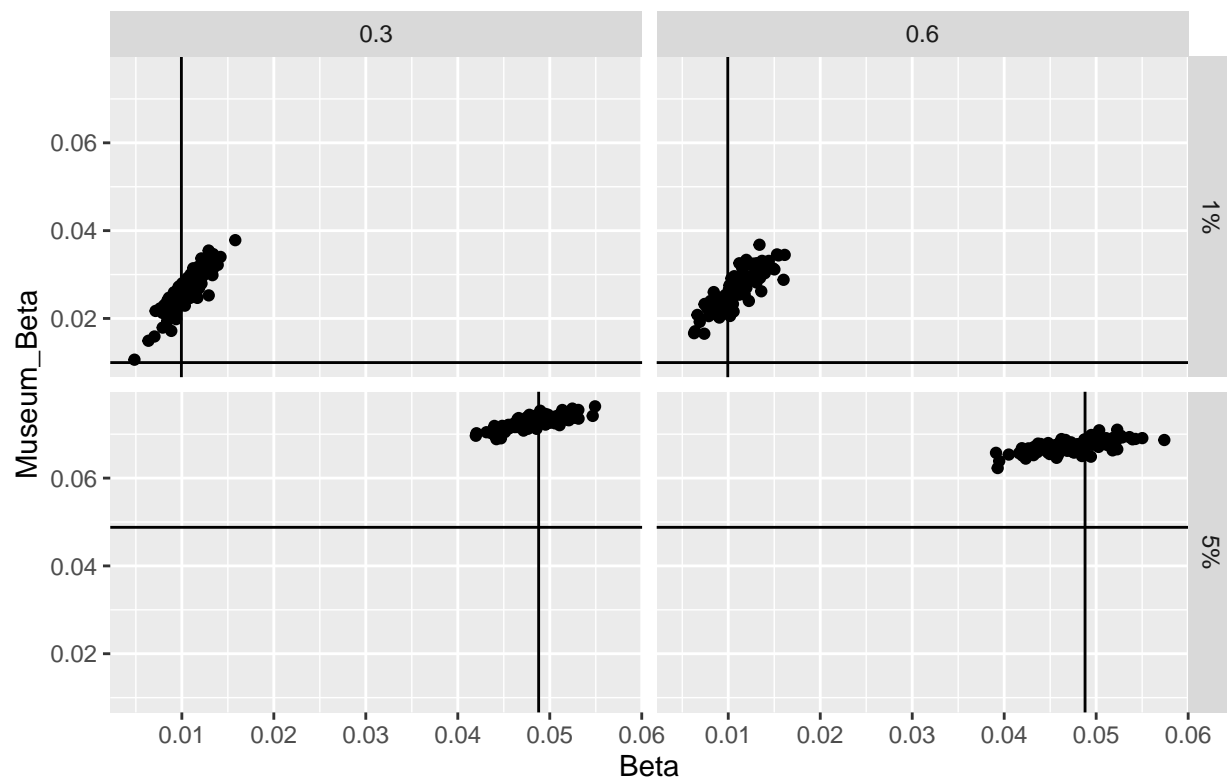


Figure 3: Plotting the estimated slopes for the Museum model and Tobit model against eachother having the variance of both error terms set to low.

Plot_High_Variance

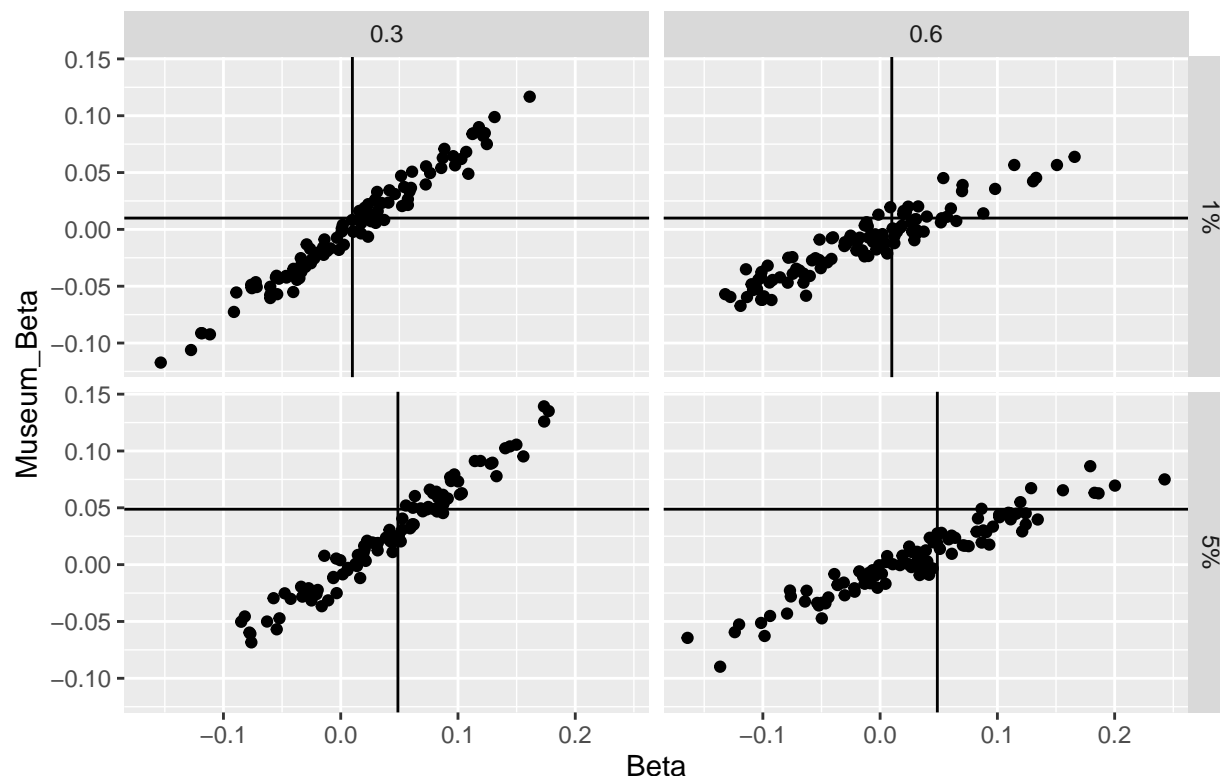


Figure 2: Plotting the estimated slopes for the Museum model and Tobit model against each other having the variance of both error terms set to high.

```
tobit_betas_individual_high <- betas %>%
  filter(Method == "Tobit") %>%
  select(-(Method)) %>%
  filter(Std == 1.4)

museum_betas_individual_high <- betas %>%
  filter(Method == "Museum") %>%
  select(-(Method)) %>%
  filter(Std == 1.4)

betas_spread_individual_high <- tobit_betas_individual_high %>%
  mutate(Museum_Beta = museum_betas_individual_high$Beta)

Plot_High_Individual_Variance <- betas_spread_individual_high %>% ggplot(aes(x=Beta, y=Museum_Beta, col =
  facet_grid(Slope_Perc ~ `Limit fraction`) +
  geom_point(alpha = 0.35) +
  geom_hline(data = data.frame(Slope_Perc="1%", y=log(1.01)), mapping=aes(yintercept=y)) +
  geom_vline(data = data.frame(Slope_Perc="1%", x=log(1.01)), mapping=aes(xintercept=x)) +
  geom_hline(data = data.frame(Slope_Perc="5%", y=log(1.05)), mapping=aes(yintercept=y)) +
  geom_vline(data = data.frame(Slope_Perc="5%", x=log(1.05)), mapping=aes(xintercept=x)) +
  labs(caption = "Figure 3: Plotting the estimated slopes for the Museum model
  and Tobit model against each other having the variance of individual specimens set to high.
  The vertical and horizontal lines correspond to the true value of the slope.")
```

```

save(Plot_High_Individual_Variance, file = "../Rdata_Files/Plot_High_Individual_Variance.Rda")

tobit_betas_individual_low <- betas %>%
  filter(Method == "Tobit") %>%
  select(-(Method)) %>%
  filter(Std == 0.05)

museum_betas_individual_low <- betas %>%
  filter(Method == "Museum") %>%
  select(-(Method)) %>%
  filter(Std == 0.05)

betas_spread_individual_low <- tobit_betas_individual_low %>%
  mutate(Museum_Beta = museum_betas_individual_low$Beta)

Plot_Low_Individual_Variance <- betas_spread_individual_low %>% ggplot(aes(x=Beta, y=Museum_Beta, col =
  facet_grid(Slope_Perc ~ `Limit fraction`) +
  geom_point(alpha = 0.35) +
  geom_hline(data = data.frame(Slope_Perc="1%", y=log(1.01)), mapping=aes(yintercept=y)) +
  geom_vline(data = data.frame(Slope_Perc="1%", x=log(1.01)), mapping=aes(xintercept=x)) +
  geom_hline(data = data.frame(Slope_Perc="5%", y=log(1.05)), mapping=aes(yintercept=y)) +
  geom_vline(data = data.frame(Slope_Perc="5%", x=log(1.05)), mapping=aes(xintercept=x)) +
  labs(caption = "Figure 2: Plotting the estimated slopes for the Museum model
  and Tobit model against eachother having the variance of individual specimens set to low.
  The vertical and horizontal lines correspond to the true value of the slope.")

save(Plot_Low_Individual_Variance, file = "../Rdata_Files/Plot_Low_Individual_Variance.Rda")

tobit_betas_individual_medium <- betas %>%
  filter(Method == "Tobit") %>%
  select(-(Method)) %>%
  filter(Std == 0.5)

museum_betas_individual_medium <- betas %>%
  filter(Method == "Museum") %>%
  select(-(Method)) %>%
  filter(Std == 0.5)

betas_spread_individual_medium <- tobit_betas_individual_medium %>%
  mutate(Museum_Beta = museum_betas_individual_medium$Beta)

Plot_Medium_Individual_Variance <- betas_spread_individual_medium %>% ggplot(aes(x=Beta, y=Museum_Beta,

```

```

facet_grid(Slope_Perc ~ `Limit fraction`) +
geom_point(alpha = 0.35) +
  geom_hline(data = data.frame(Slope_Perc="1%", y=log(1.01)), mapping=aes(yintercept=y)) +
  geom_vline(data = data.frame(Slope_Perc="1%", x=log(1.01)), mapping=aes(xintercept=x)) +
  geom_hline(data = data.frame(Slope_Perc="5%", y=log(1.05)), mapping=aes(yintercept=y))+
  geom_vline(data = data.frame(Slope_Perc="5%", x=log(1.05)), mapping=aes(xintercept=x)) +
labs(caption = "Figure 3: Plotting the estimated slopes for the Museum model
and Tobit model against eachother having the variance of individual specimens set to medium.
The vertical and horizontal lines correspond to the true value of the slope.")

save(Plot_Medium_Individual_Variance, file = "../Rdata_Files/Plot_Medium_Individual_Variance.Rda")

```