

Result Graph Summary

Hun

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```
library(kableExtra)
```

Jimmy needs to give me the right estimate of effect right now here is what I am using

```
smaller_true_ATE <- 0.15  
bigger_true_ATE <- 0.3  
  
pos_beta <- 1  
neg_beta <- -1
```

```
view(binary_scen_1)
```

Compiling Binary Data

Get all the odd numbers $\beta_1 = 0.767$

```
binary_final_odd <-  
  binary_scen_1 %>% mutate(n_sample = 1000, beta1 = 0.767, desired_prop = 0.1) %>%  
  bind_rows(binary_scen_3 %>% mutate(n_sample = 1000, beta1 = 0.767, desired_prop = 0.2)) %>%  
  bind_rows(binary_scen_5 %>% mutate(n_sample = 1000, beta1 = 0.767, desired_prop = 0.3)) %>%  
  bind_rows(binary_scen_13 %>% mutate(n_sample = 100, beta1 = 0.767, desired_prop = 0.1)) %>%  
  bind_rows(binary_scen_15 %>% mutate(n_sample = 100, beta1 = 0.767, desired_prop = 0.2)) %>%  
  bind_rows(binary_scen_17 %>% mutate(n_sample = 100, beta1 = 0.767, desired_prop = 0.3))  
  
binary_final_odd <- binary_final_odd %>%  
  mutate(  
    ATE_bias = ATE - smaller_true_ATE,  
    empirical_bias = empirical_mean - smaller_true_ATE,  
    boot_type = ifelse(boot_type == 0, "Simple", "Complex")  
  )  
  
rm(binary_scen_1, binary_scen_3, binary_scen_5, binary_scen_13, binary_scen_15, binary_scen_17)
```

Get all the even numbers $\beta_1 = 1.587$

```
binary_final_even <-  
  binary_scen_2 %>% mutate(n_sample = 1000, beta1 = 1.587, desired_prop = 0.1) %>%  
  bind_rows(binary_scen_4 %>% mutate(n_sample = 1000, beta1 = 1.587, desired_prop = 0.2)) %>%  
  bind_rows(binary_scen_6 %>% mutate(n_sample = 1000, beta1 = 1.587, desired_prop = 0.3)) %>%
```

```

bind_rows(binary_scen_14 %>% mutate(n_sample = 100, beta1 = 1.587, desired_prop = 0.1)) %>%
bind_rows(binary_scen_16 %>% mutate(n_sample = 100, beta1 = 1.587, desired_prop = 0.2)) %>%
bind_rows(binary_scen_18 %>% mutate(n_sample = 100, beta1 = 1.587, desired_prop = 0.3))

binary_final_even <- binary_final_even %>%
  mutate(
    ATE_bias = ATE - bigger_true_ATE,
    empirical_bias = empirical_mean - bigger_true_ATE,
    boot_type = ifelse(boot_type == 0, "Simple", "Complex")
  )

rm(binary_scen_2, binary_scen_4, binary_scen_6, binary_scen_14, binary_scen_16, binary_scen_18)

binary_final <- binary_final_even %>% bind_rows(binary_final_odd)

binary_final %>% group_by(scenario) %>%
  summarise(E_Bias = mean(empirical_bias),
            E_se = mean(empirical_se))

```

Compiling Continuous Data

```

continuous_final_odd <-
  cont_df_scen_1 %>% mutate(n_sample = 1000, beta1 = pos_beta, desired_prop = 0.1) %>%
  bind_rows(cont_df_scen_3 %>% mutate(n_sample = 1000, beta1 = pos_beta, desired_prop = 0.2)) %>%
  bind_rows(cont_df_scen_5 %>% mutate(n_sample = 1000, beta1 = pos_beta, desired_prop = 0.3)) %>%
  bind_rows(cont_df_scen_13 %>% mutate(n_sample = 100, beta1 = pos_beta, desired_prop = 0.1)) %>%
  bind_rows(cont_df_scen_15 %>% mutate(n_sample = 100, beta1 = pos_beta, desired_prop = 0.2)) %>%
  bind_rows(cont_df_scen_17 %>% mutate(n_sample = 100, beta1 = pos_beta, desired_prop = 0.3)) %>%
  mutate(
    ATE_bias = ATE - pos_beta,
    empirical_bias = empirical_mean - pos_beta,
    boot_type = ifelse(boot_type == 0, "Simple", "Complex")
  )

rm(cont_df_scen_1, cont_df_scen_3, cont_df_scen_5, cont_df_scen_13, cont_df_scen_15, cont_df_scen_17)

continuous_final_even <-
  cont_df_scen_2 %>% mutate(n_sample = 1000, beta1 = neg_beta, desired_prop = 0.1) %>%
  bind_rows(cont_df_scen_4 %>% mutate(n_sample = 1000, beta1 = neg_beta, desired_prop = 0.2)) %>%
  bind_rows(cont_df_scen_6 %>% mutate(n_sample = 1000, beta1 = neg_beta, desired_prop = 0.3)) %>%
  bind_rows(cont_df_scen_14 %>% mutate(n_sample = 100, beta1 = neg_beta, desired_prop = 0.1)) %>%
  bind_rows(cont_df_scen_16 %>% mutate(n_sample = 100, beta1 = neg_beta, desired_prop = 0.2)) %>%
  bind_rows(cont_df_scen_18 %>% mutate(n_sample = 100, beta1 = neg_beta, desired_prop = 0.3)) %>%
  mutate(
    ATE_bias = ATE - neg_beta,
    empirical_bias = empirical_mean - neg_beta,
    boot_type = ifelse(boot_type == 0, "Simple", "Complex")
  )

rm(cont_df_scen_2, cont_df_scen_4, cont_df_scen_6, cont_df_scen_14, cont_df_scen_16, cont_df_scen_18)

```

```
continuous_final <-
  continuous_final_odd %>%
  bind_rows(continuous_final_even) %>%
  rename(scenario = scenario_id)

rm(continuous_final_even, continuous_final_odd)
```

Creating Dataframes

```
cr_df_binary <-
  binary_final %>%
  group_by(scenario, boot_type) %>%
  summarize(cr = (sum(covered) / 100) %>% round(digits = 3)) %>%
  pivot_wider(names_from = boot_type, values_from = cr) %>%
  rename(S_CR = Simple, C_CR = Complex)
```

'summarise()' has grouped output by 'scenario'. You can override using the '.groups' argument.

```
cr_df_continuous <-
  continuous_final %>%
  group_by(scenario, boot_type) %>%
  summarize(cr = (sum(covered) / 100) %>% round(digits = 3)) %>%
  pivot_wider(names_from = boot_type, values_from = cr) %>%
  rename(S_CR = Simple, C_CR = Complex)
```

'summarise()' has grouped output by 'scenario'. You can override using the '.groups' argument.

```
se_df_binary <-
  binary_final %>%
  group_by(scenario, boot_type) %>%
  summarize(se_ATE = sd(ATE) %>% round(digits = 3)) %>%
  pivot_wider(names_from = boot_type, values_from = se_ATE) %>%
  rename(S_SE = Simple, C_SE = Complex)
```

'summarise()' has grouped output by 'scenario'. You can override using the '.groups' argument.

```
se_df_continuous <-
  continuous_final %>%
  group_by(scenario, boot_type) %>%
  summarize(se_ATE = sd(ATE) %>% round(digits = 3)) %>%
  pivot_wider(names_from = boot_type, values_from = se_ATE) %>%
  rename(S_SE = Simple, C_SE = Complex)
```

'summarise()' has grouped output by 'scenario'. You can override using the '.groups' argument.

```
bias_df_binary <-
  binary_final %>%
  group_by(scenario, boot_type) %>%
  summarize(bias = mean(ATE_bias) %>% round(digits = 3)) %>%
  pivot_wider(names_from = boot_type, values_from = bias) %>%
  rename(S_Bias = Simple, C_Bias = Complex)
```

```
## 'summarise()' has grouped output by 'scenario'. You can override using the '.groups' argument.
```

```
bias_df_continuous <-  
  continuous_final %>%  
  group_by(scenario, boot_type) %>%  
  summarize(bias = mean(ATE_bias) %>% round(digits = 3)) %>%  
  pivot_wider(names_from = boot_type, values_from = bias) %>%  
  rename(S_Bias = Simple, C_Bias = Complex)
```

```
## 'summarise()' has grouped output by 'scenario'. You can override using the '.groups' argument.
```

```
all_result_binary <-  
  se_df_binary %>%  
  full_join(bias_df_binary) %>%  
  full_join(cr_df_binary) %>%  
  relocate(starts_with("S")) %>%  
  relocate(scenario) %>%  
  rename(Scenario = scenario)
```

```
## Joining, by = "scenario"  
## Joining, by = "scenario"
```

```
all_result_continuous <-  
  se_df_continuous %>%  
  full_join(bias_df_continuous) %>%  
  full_join(cr_df_continuous) %>%  
  relocate(starts_with("S")) %>%  
  relocate(scenario) %>%  
  rename(Scenario = scenario)
```

```
## Joining, by = "scenario"  
## Joining, by = "scenario"
```

```
all_result_binary
```

```
## # A tibble: 12 x 7  
## # Groups:   Scenario [12]  
##   Scenario  S_SE S_Bias  S_CR   C_SE C_Bias  C_CR  
##   <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>  
## 1      1  0.054 -0.007  0.91  0.036 -0.008  1  
## 2      2  0.053 -0.107  0.69  0.033 -0.11  0.98  
## 3      3  0.043 -0.017  0.83  0.03 -0.015  0.99  
## 4      4  0.039 -0.119  0.67  0.028 -0.116  0.91  
## 5      5  0.033 -0.014  0.88  0.028 -0.013  0.98  
## 6      6  0.032 -0.119  0.63  0.026 -0.119  0.84  
## 7     13  0.194 -0.034  0.8  NA      NA      NA  
## 8     14  0.147 -0.115  0.85 NA      NA      NA  
## 9     15  0.14  0.008  0.86  0.109 -0.007  0.99  
## 10    16  0.113 -0.113  0.82  0.08 -0.117  0.99  
## 11    17  0.115 -0.022  0.81  0.103 -0.013  0.98  
## 12    18  0.096 -0.115  0.81  0.072 -0.115  0.98
```

```
all_result_continuous
```

```
## # A tibble: 12 x 7
## # Groups:   Scenario [12]
##   Scenario S_SE S_Bias S_CR C_SE C_Bias C_CR
##   <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
## 1      1  0.114 -0.028  0.94  0.054 -0.014  1
## 2      2  0.114 -0.028  0.92  0.054 -0.014  0.93
## 3      3  0.071  0.003  0.95  0.041 -0.01  0.95
## 4      4  0.071  0.003  0.95  0.041 -0.01  0.95
## 5      5  0.052 -0.01  0.92  0.034 -0.013  0.96
## 6      6  0.052 -0.01  0.92  0.034 -0.013  0.96
## 7     13  0.367  0.002  0.95 NA      NA      NA
## 8     14  0.367  0.002  0.95 NA      NA      NA
## 9     15  0.302 -0.037  0.96  0.138 -0.03  0.96
## 10    16  0.302 -0.037  0.96  0.138 -0.03  0.96
## 11    17  0.218 -0.006  0.95  0.115 -0.012  0.96
## 12    18  0.218 -0.006  0.95  0.115 -0.012  0.96
```

```
all_result_binary["Scenario"] <-
  c("Large Sample, ATE = 1, p = 0.1",
    "Large Sample, ATE = -1, p = 0.1",
    "Large Sample, ATE = 1, p = 0.2",
    "Large Sample, ATE = -1, p = 0.2",
    "Large Sample, ATE = 1, p = 0.3",
    "Large Sample, ATE = -1, p = 0.3",
    "Small Sample, ATE = 1, p = 0.1",
    "Small Sample, ATE = -1, p = 0.1",
    "Small Sample, ATE = 1, p = 0.2",
    "Small Sample, ATE = -1, p = 0.2",
    "Small Sample, ATE = 1, p = 0.3",
    "Small Sample, ATE = -1, p = 0.3")
```

```
all_result_continuous["Scenario"] <-
  c("Large Sample, ATE = 0.15, p = 0.1",
    "Large Sample, ATE = 0.30, p = 0.1",
    "Large Sample, ATE = 0.15, p = 0.2",
    "Large Sample, ATE = 0.30, p = 0.2",
    "Large Sample, ATE = 0.15, p = 0.3",
    "Large Sample, ATE = 0.30, p = 0.3",
    "Small Sample, ATE = 0.15, p = 0.1",
    "Small Sample, ATE = 0.30, p = 0.1",
    "Small Sample, ATE = 0.15, p = 0.2",
    "Small Sample, ATE = 0.30, p = 0.2",
    "Small Sample, ATE = 0.15, p = 0.3",
    "Small Sample, ATE = 0.30, p = 0.3")
```

```
all_result_binary %>%
  kbl() %>%
  kable_classic("striped", full_width = F, html_font = "Cambria") %>%
  column_spec(5, width = "5cm") %>%
  column_spec(1:7, border_left = T, border_right = T) %>%
  add_header_above(c("Binary Outcome" = 1, "Simple" = 2, "Empirical(no boot)" = 2, "Complex" = 2))
```

Binary Outcome	Simple		Empirical(no boot)		Complex	
Scenario	S_SE	S_Bias	S_CR	C_SE	C_Bias	C_CR
Large Sample, ATE = 1, p = 0.1	0.054	-0.007	0.91	0.036	-0.008	1.00
Large Sample, ATE = -1, p = 0.1	0.053	-0.107	0.69	0.033	-0.110	0.98
Large Sample, ATE = 1, p = 0.2	0.043	-0.017	0.83	0.030	-0.015	0.99
Large Sample, ATE = -1, p = 0.2	0.039	-0.119	0.67	0.028	-0.116	0.91
Large Sample, ATE = 1, p = 0.3	0.033	-0.014	0.88	0.028	-0.013	0.98
Large Sample, ATE = -1, p = 0.3	0.032	-0.119	0.63	0.026	-0.119	0.84
Small Sample, ATE = 1, p = 0.1	0.194	-0.034	0.80	NA	NA	NA
Small Sample, ATE = -1, p = 0.1	0.147	-0.115	0.85	NA	NA	NA
Small Sample, ATE = 1, p = 0.2	0.140	0.008	0.86	0.109	-0.007	0.99
Small Sample, ATE = -1, p = 0.2	0.113	-0.113	0.82	0.080	-0.117	0.99
Small Sample, ATE = 1, p = 0.3	0.115	-0.022	0.81	0.103	-0.013	0.98
Small Sample, ATE = -1, p = 0.3	0.096	-0.115	0.81	0.072	-0.115	0.98

Continuous Outcome	Simple		Empirical(no boot)		Complex	
Scenario	S_SE	S_Bias	S_CR	C_SE	C_Bias	C_CR
Large Sample, ATE = 0.15, p = 0.1	0.114	-0.028	0.94	0.054	-0.014	1.00
Large Sample, ATE = 0.30, p = 0.1	0.114	-0.028	0.92	0.054	-0.014	0.93
Large Sample, ATE = 0.15, p = 0.2	0.071	0.003	0.95	0.041	-0.010	0.95
Large Sample, ATE = 0.30, p = 0.2	0.071	0.003	0.95	0.041	-0.010	0.95
Large Sample, ATE = 0.15, p = 0.3	0.052	-0.010	0.92	0.034	-0.013	0.96
Large Sample, ATE = 0.30, p = 0.3	0.052	-0.010	0.92	0.034	-0.013	0.96
Small Sample, ATE = 0.15, p = 0.1	0.367	0.002	0.95	NA	NA	NA
Small Sample, ATE = 0.30, p = 0.1	0.367	0.002	0.95	NA	NA	NA
Small Sample, ATE = 0.15, p = 0.2	0.302	-0.037	0.96	0.138	-0.030	0.96
Small Sample, ATE = 0.30, p = 0.2	0.302	-0.037	0.96	0.138	-0.030	0.96
Small Sample, ATE = 0.15, p = 0.3	0.218	-0.006	0.95	0.115	-0.012	0.96
Small Sample, ATE = 0.30, p = 0.3	0.218	-0.006	0.95	0.115	-0.012	0.96

```

all_result_continuous %>%
  kbl() %>%
  kable_classic("striped", full_width = F , html_font = "Cambria") %>%
  column_spec(5, width = "5cm") %>%
  column_spec(1:7, border_left = T, border_right = T) %>%
  add_header_above(c("Continuous Outcome" = 1, "Simple" = 2, "Empirical(no boot)" = 2, "Complex" = 2))

```