# Result Graph Summary

Hun

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```
library(kableExtra)
```

Jimmy needs to give me the right esitmate 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
```

| 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 |

```
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))
```

```
all_result_continuous %>%
  kbl() %>%
  kable_classic("striped", full_width = F , html_font = "Cambria") %>%
```

| 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 |

```
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))
```