Causal Project

Describing the Data and Methodology

Performing the Anlysis

```
############################## rape
attrape_pc <- att_gt(yname = "rape_pc", # LHS variable
               tname = "year", # time variable
               idname = "statefip", # id variable
               gname = "First.Treat", # first treatment period variable
               data = CleanUPWork, # data
               xformla = NULL, # no covariates
               est_method = "dr", # "dr" is doubly robust. "ipw" is inverse probability weighting. "reg
               control_group = "nevertreated", # set the comparison group which is either "nevertreated
               bstrap = TRUE, # if TRUE compute bootstrapped SE
               biters = 1000, # number of bootstrap iterations
               print_details = FALSE,
               clustervars = "statefip", # cluster level
               panel = TRUE) # whether the data is panel or repeated cross-sectional
```

```
## Warning in pre_process_did(yname = yname, tname = tname, idname = idname, : Be aware that there are s
##   Check groups: 2004,2005,2006.
```

```
## Warning in att_gt(yname = "rape_pc", tname = "year", idname = "statefip", : Not
## returning pre-test Wald statistic due to singular covariance matrix
```

```
# Aggregate ATT
agg_effects <- aggte(attrape_pc, type = "group")
summary(agg_effects)
```

```
##
## Call:
## aggte(MP = attrape_pc, type = "group")
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
##
## Overall ATT:
##      ATT Std. Error     [95%  Conf. Int.]
##  -5.7036     5.4495  -16.3844      4.9773
##
##
## Group Effects:
##  group      ATT Std. Error [95% Simult.  Conf. Band]
```

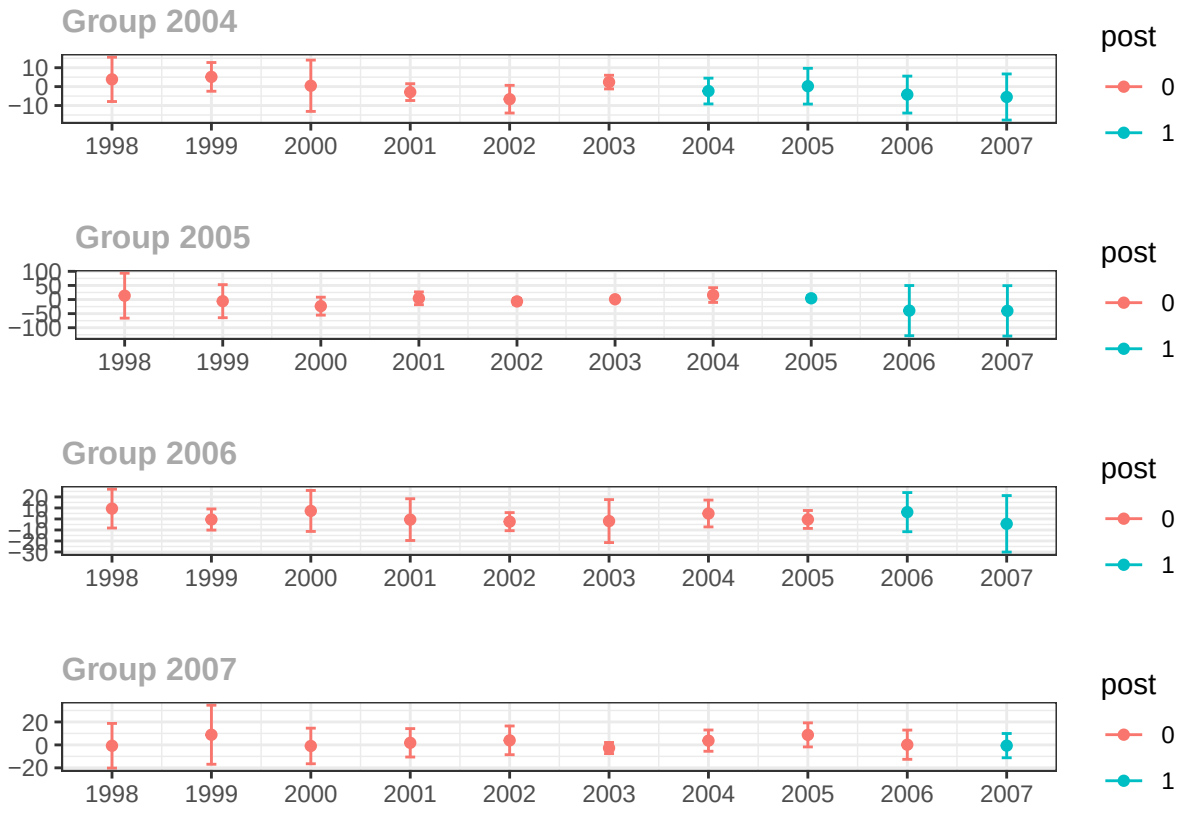
```
##   2004  -2.9546     3.3035       -9.3518      3.4425
##   2005 -25.0432    23.5835      -70.7127     20.6263
##   2006   0.8789     8.0267      -14.6649     16.4227
##   2007  -0.6289     4.4093       -9.1676      7.9097
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Group-time ATTs
summary(attrape_pc)
```

```
##
## Call:
## att_gt(yname = "rape_pc", tname = "year", idname = "statefip",
##     gname = "First.Treat", xformla = NULL, data = CleanUPWork,
##     panel = TRUE, control_group = "nevertreated", bstrap = TRUE,
##     biters = 1000, clustervars = "statefip", est_method = "dr",
##     print_details = FALSE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
## Group-Time Average Treatment Effects:
##  Group Time ATT(g,t) Std. Error [95% Simult.  Conf. Band]
##   2004 1998   3.8269     4.6551       -7.8881     15.5420
##   2004 1999   5.1542     3.0155       -2.4346     12.7430
##   2004 2000   0.4614     5.3883      -13.0989     14.0217
##   2004 2001  -2.9017     1.7650       -7.3435      1.5401
##   2004 2002  -6.6432     2.9061      -13.9567      0.6704
##   2004 2003   2.3849     1.4368       -1.2311      6.0008
##   2004 2004  -2.3386     2.7044       -9.1446      4.4674
##   2004 2005   0.2285     3.7583       -9.2296      9.6867
##   2004 2006  -4.2107     3.8785      -13.9714      5.5500
##   2004 2007  -5.4978     4.8473      -17.6966      6.7010
##   2005 1998  13.6613    31.6770      -66.0578     93.3803
##   2005 1999  -5.8330    23.3075      -64.4892     52.8232
##   2005 2000 -23.4773    12.6345      -55.2736      8.3190
##   2005 2001   4.3749     9.0174      -18.3185     27.0682
##   2005 2002  -6.5981     4.2104      -17.1941      3.9978
##   2005 2003   1.0420     1.5866       -2.9510      5.0350
##   2005 2004  15.8601    10.3851      -10.2752     41.9954
##   2005 2005   4.4094     3.6304       -4.7268     13.5456
##   2005 2006 -39.2879    35.3772     -128.3190     49.7432
##   2005 2007 -40.2510    35.5475     -129.7107     49.2086
##   2006 1998   9.3976     6.9968       -8.2108     27.0060
##   2006 1999  -0.5145     3.8134      -10.1115      9.0825
##   2006 2000   7.2814     7.3876      -11.3104     25.8731
##   2006 2001  -0.5939     7.5305      -19.5453     18.3575
##   2006 2002  -2.4489     3.2613      -10.6564      5.7586
##   2006 2003  -1.9310     7.7488      -21.4318     17.5698
##   2006 2004   4.9478     4.8425       -7.2389     17.1346
##   2006 2005  -0.4428     3.2312       -8.5745      7.6889
##   2006 2006   6.1950     7.0634      -11.5810     23.9710
```

```
##   2006 2007  -4.4373    10.1946      -30.0932     21.2187
##   2007 1998  -0.7351     7.7361      -20.2039     18.7338
##   2007 1999   8.8657    10.2210      -16.8568     34.5882
##   2007 2000  -0.9161     6.1631      -16.4262     14.5940
##   2007 2001   1.8186     4.9210      -10.5657     14.2030
##   2007 2002   3.9741     4.9708       -8.5355     16.4837
##   2007 2003  -2.7141     1.9304       -7.5720      2.1439
##   2007 2004   3.7246     3.6789       -5.5338     12.9830
##   2007 2005   8.7221     4.1644       -1.7580     19.2022
##   2007 2006   0.1799     5.0623      -12.5601     12.9199
##   2007 2007  -0.6289     4.2045      -11.2100      9.9522
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```r
# Plot group-time ATTs
ggdid(attrape_pc)
```

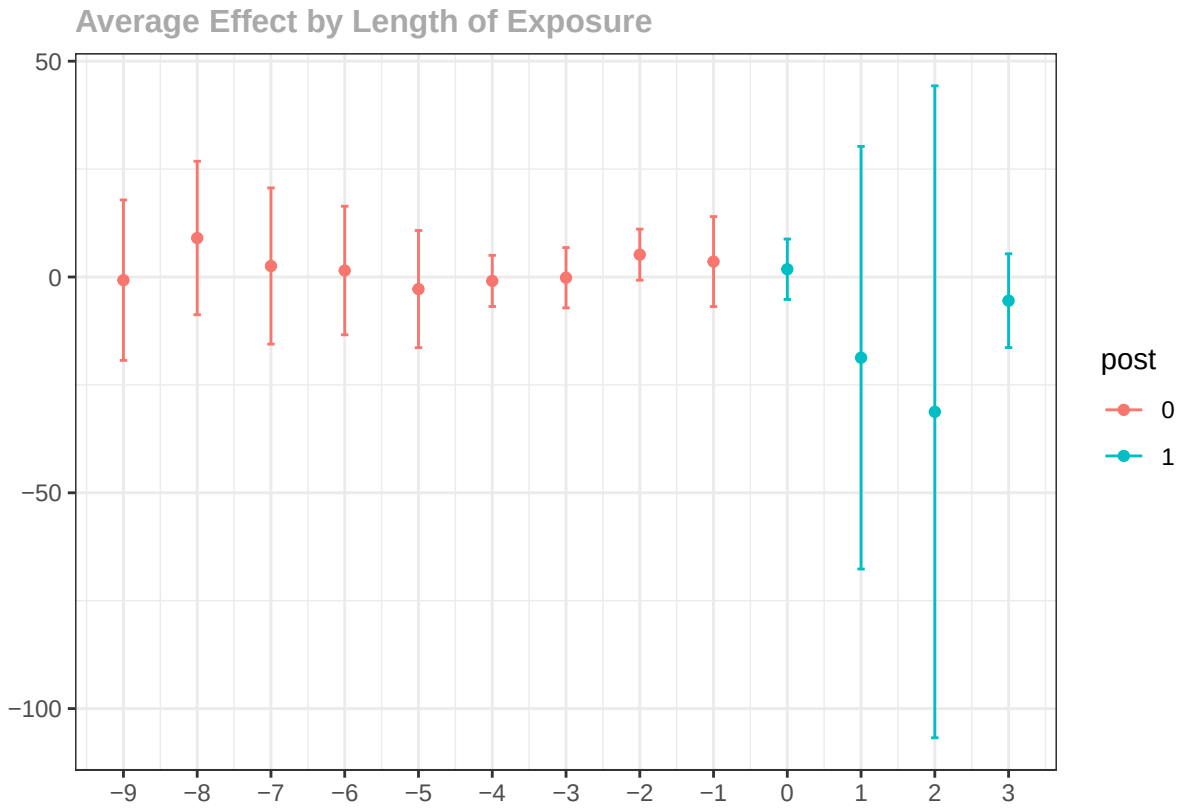



```r
# Event-study
agg_effects_es <- aggte(attrape_pc, type = "dynamic", na.rm = TRUE)
summary(agg_effects_es)
```

```
##
```

```
## Call:
## aggte(MP = attrape_pc, type = "dynamic", na.rm = TRUE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
##
## Overall ATT:
##       ATT Std. Error     [95%  Conf. Int.]
##  -13.4136      12.56  -38.0309     11.2036
##
##
## Dynamic Effects:
##  event time      ATT Std. Error [95% Simult.  Conf. Band]
##          -9  -0.7351     7.6827      -19.3194     17.8493
##          -8   9.0253     7.3494       -8.7528     26.8034
##          -7   2.5406     7.4790      -15.5508     20.6320
##          -6   1.4930     6.1578      -13.4026     16.3886
##          -5  -2.8029     5.6094      -16.3718     10.7660
##          -4  -0.9114     2.4481       -6.8333      5.0106
##          -3  -0.1727     2.8877       -7.1580      6.8127
##          -2   5.1701     2.4450       -0.7443     11.0844
##          -1   3.5640     4.3076       -6.8559     13.9839
##           0   1.7909     2.8904       -5.2008      8.7826
##           1 -18.7067    20.2375      -67.6607     30.2473
##           2 -31.2410    31.2224     -106.7672     44.2853
##           3  -5.4978     4.4908      -16.3610      5.3654
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
rape <- cbind(c(round(agg_effects_es$overall.att, digits = 3), "(-9.37, 2.67)"))
# Plot event-study coefficients
ggdid(agg_effects_es)
```




```
############################## larceny
attlarceny_pc <- att_gt(yname = "larceny_pc", # LHS variable
                  tname = "year", # time variable
                  idname = "statefip", # id variable
                  gname = "First.Treat", # first treatment period variable
                  data = CleanUPWork, # data
                  xformla = NULL, # no covariates
                  #xformla = ~ l_police, # with covariates
                  est_method = "dr", # "dr" is doubly robust. "ipw" is inverse probability weighting. "
                  control_group = "nevertreated", # set the comparison group which is either "nevertrea
                  bstrap = TRUE, # if TRUE compute bootstrapped SE
                  biters = 1000, # number of bootstrap iterations
                  print_details = FALSE,
                  clustervars = "statefip", # cluster level
                  panel = TRUE) # whether the data is panel or repeated cross-sectional
```

```
## Warning in pre_process_did(yname = yname, tname = tname, idname = idname, : Be aware that there are s
##   Check groups: 2004,2005,2006.
```

```
## Warning in att_gt(yname = "larceny_pc", tname = "year", idname = "statefip", :
## Not returning pre-test Wald statistic due to singular covariance matrix
```

```
agg_effects1 <- aggte(attlarceny_pc, type = "group")
summary(agg_effects1)
```

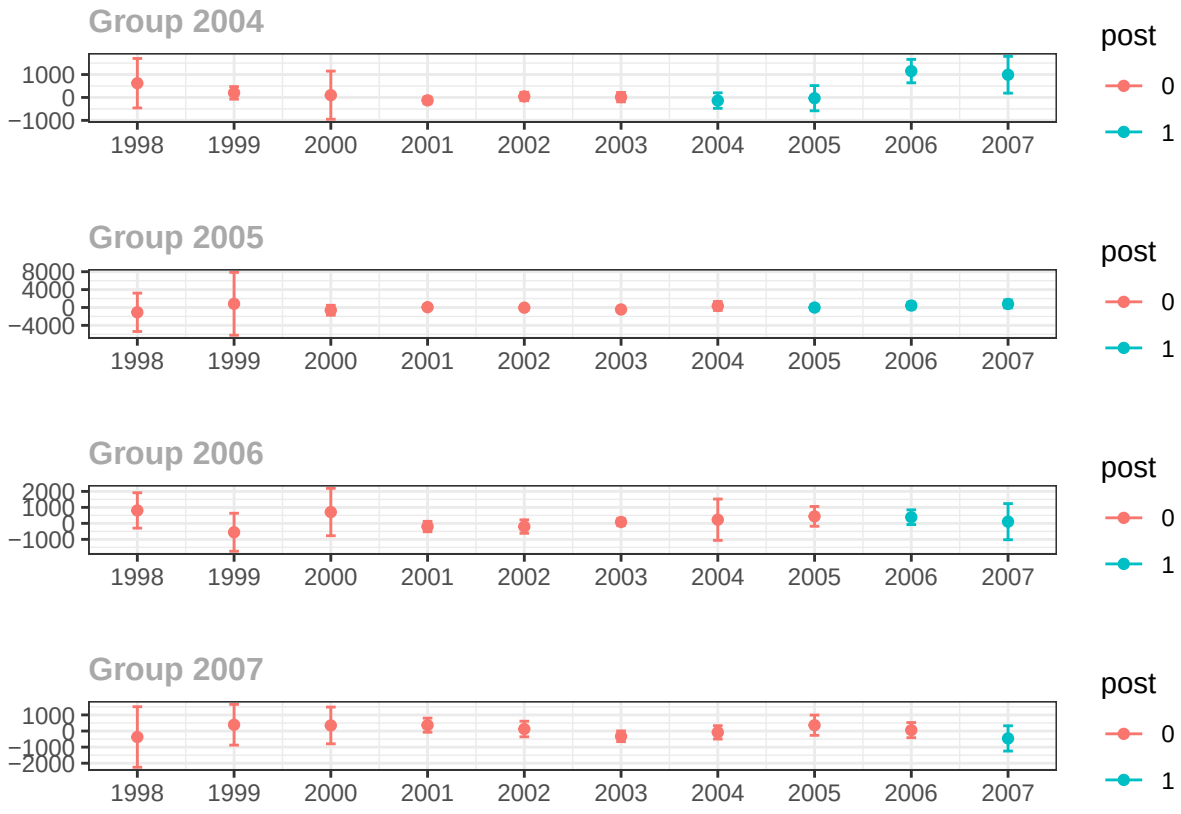
```
##
## Call:
## aggte(MP = attlarceny_pc, type = "group")
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
##
## Overall ATT:
##      ATT Std. Error     [95%  Conf. Int.]
##  -55.788    241.679 -529.4702    417.8942
##
##
## Group Effects:
##  group       ATT Std. Error [95% Simult.  Conf. Band]
##   2004  492.4946   153.0460      170.5140    814.4752 *
##   2005  399.4406   180.7793       19.1142    779.7670 *
##   2006  246.8456   275.2421     -332.2129    825.9042
##   2007 -458.9122   326.7264    -1146.2842    228.4599
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Group-time ATTs you want this
summary(attlarceny_pc)
```

```
##
## Call:
## att_gt(yname = "larceny_pc", tname = "year", idname = "statefip",
##     gname = "First.Treat", xformla = NULL, data = CleanUPWork,
##     panel = TRUE, control_group = "nevertreated", bstrap = TRUE,
##     biters = 1000, clustervars = "statefip", est_method = "dr",
##     print_details = FALSE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
## Group-Time Average Treatment Effects:
##  Group Time   ATT(g,t) Std. Error [95% Simult.  Conf. Band]
##   2004 1998   621.2352   430.9979     -458.0994   1700.5698
##   2004 1999   199.2324   109.6334      -75.3192    473.7840
##   2004 2000    99.6121   419.7231     -951.4873   1150.7114
##   2004 2001  -126.6919    58.5320     -273.2716     19.8879
##   2004 2002    42.8971    73.0222     -139.9701    225.7643
##   2004 2003    14.3337    81.5692     -189.9374    218.6049
##   2004 2004  -136.7460   134.7790     -474.2687    200.7767
##   2004 2005   -32.8089   219.6118     -582.7758    517.1580
##   2004 2006  1149.6904   203.5397      639.9723   1659.4085 *
##   2004 2007   989.8429   320.3707      187.5488   1792.1371 *
##   2005 1998 -1079.8782  1712.7604    -5369.0901   3209.3338
##   2005 1999   818.6073  2807.7143    -6212.6633   7849.8778
##   2005 2000  -616.4716   439.7394    -1717.6972    484.7540
##   2005 2001    67.2783   165.0924     -346.1575    480.7141
##   2005 2002   -42.4155   108.2759     -313.5675    228.7365
```

```
##   2005 2003  -446.0302   201.2138     -949.9237     57.8633
##   2005 2004   336.1252   395.4949     -654.3002   1326.5506
##   2005 2005   -15.0639   226.7951     -583.0197    552.8918
##   2005 2006   428.2542   293.9537     -307.8849   1164.3933
##   2005 2007   785.1315   346.7483      -83.2193   1653.4824
##   2006 1998   809.6353   442.0727     -297.4333   1916.7040
##   2006 1999  -555.2619   475.0978    -1745.0345    634.5106
##   2006 2000   707.6768   591.6327     -773.9303   2189.2839
##   2006 2001  -198.6659   130.4415     -525.3265    127.9947
##   2006 2002  -200.2328   168.3196     -621.7502    221.2847
##   2006 2003    88.0294    83.2348     -120.4129    296.4717
##   2006 2004   229.4040   516.1020    -1063.0539   1521.8619
##   2006 2005   438.2811   247.1866     -180.7406   1057.3028
##   2006 2006   386.9633   183.8308      -73.3983    847.3250
##   2006 2007   106.7279   451.3895    -1023.6725   1237.1284
##   2007 1998  -370.6882   750.6626    -2250.5490   1509.1726
##   2007 1999   390.1710   505.4214     -875.5399   1655.8820
##   2007 2000   348.8261   455.3171     -791.4104   1489.0625
##   2007 2001   364.5320   174.6189      -72.7606    801.8246
##   2007 2002   126.0819   193.7002     -358.9956    611.1593
##   2007 2003  -324.5134   132.8377     -657.1746      8.1478
##   2007 2004   -82.7284   165.2573     -496.5770    331.1202
##   2007 2005   361.8597   251.0516     -266.8409    990.5603
##   2007 2006    57.2129   187.9427     -413.4461    527.8719
##   2007 2007  -458.9122   313.4087    -1243.7717    325.9474
## ---
## Signif. codes: `*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Plot group-time ATTs
ggdid(attlarceny_pc)
```

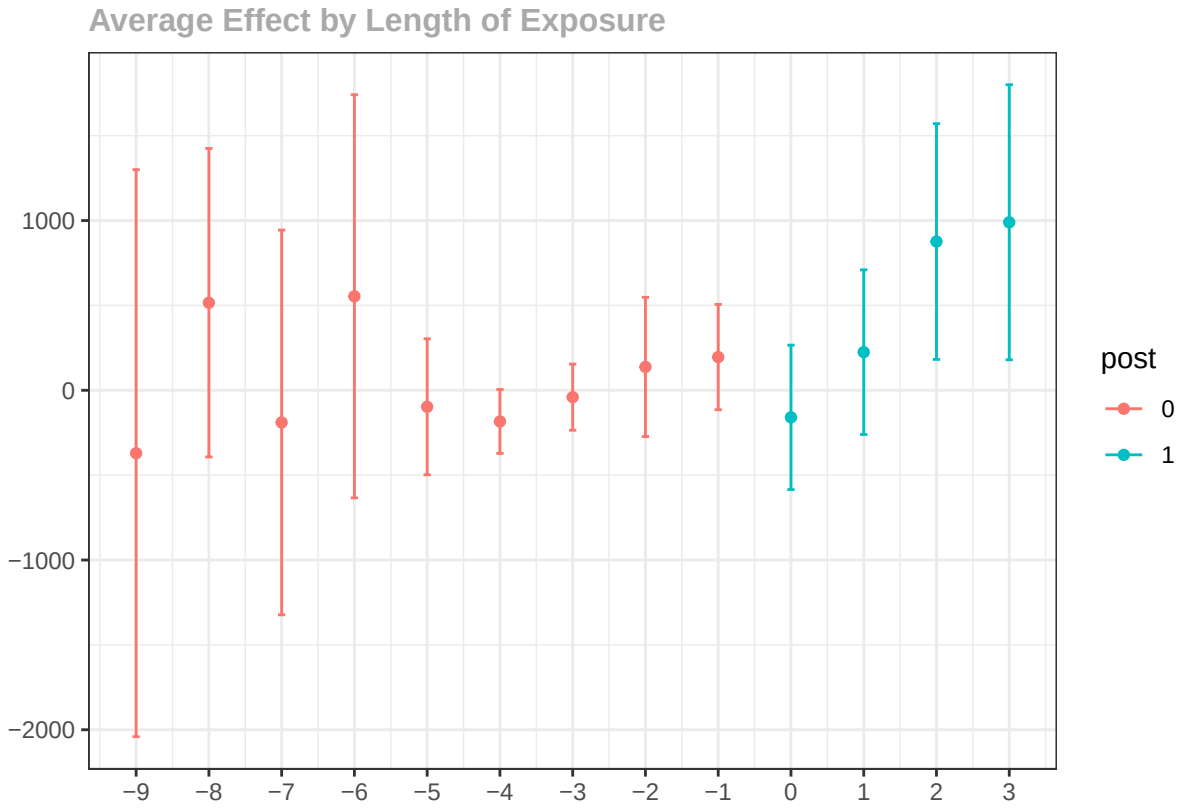



```
# Event-study you want this
agg_effects_es1 <- aggte(attlarceny_pc, type = "dynamic", na.rm = TRUE)
summary(agg_effects_es1)
```

```
##
## Call:
## aggte(MP = attlarceny_pc, type = "dynamic", na.rm = TRUE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Tim
##
##
## Overall ATT:
##       ATT Std. Error     [95%  Conf. Int.]
##  482.7936   218.4659   54.6082    910.9789 *
##
##
## Dynamic Effects:
##  event time       ATT Std. Error [95% Simult.  Conf. Band]
##          -9 -370.6882   698.6274    -2041.0062   1299.6299
##          -8  516.0103   380.0590     -392.6565   1424.6771
##          -7 -189.5106   473.9831    -1322.7363    943.7151
##          -6  553.7008   496.7380     -633.9287   1741.3303
##          -5  -97.4005   167.6055     -498.1213    303.3203
##          -4 -183.6318    78.6811     -371.7470      4.4835
##          -3  -40.6392    81.4884     -235.4663    154.1879
##          -2  137.5740   171.5654     -272.6142    547.7623
```

```
##          -1  195.5745   129.8084     -114.7787    505.9277
##           0 -159.5309   177.8981     -584.8598    265.7979
##           1  224.5911   202.8423     -260.3757    709.5579
##           2  876.2712   290.4533      181.8390   1570.7035 *
##           3  989.8429   338.8955      179.5924   1800.0935 *
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
larceny <- cbind(c(round(agg_effects_es1$overall.att, digits = 3), "(14.11, 227.28)*"))
# Plot event-study coefficients
ggdid(agg_effects_es1)
```




```
# Create table of estimates, particular outcomes, row = estimated att
# table violent, table table non-violent
# what do they recommend for the group specifc att
# work in terms of _pc

################################ vehicle
attvehicle_pc <- att_gt(yname = "vehicle_pc", # LHS variable
                        tname = "year", # time variable
                        idname = "statefip", # id variable
                        gname = "First.Treat", # first treatment period variable
```

```
                        data = CleanUPWork, # data
                        xformla = NULL, # no covariates
                        #xformla = ~ l_police, # with covariates
                        est_method = "dr", # "dr" is doubly robust. "ipw" is inverse probability weight
                        control_group = "nevertreated", # set the comparison group which is either "nev
                        bstrap = TRUE, # if TRUE compute bootstrapped SE
                        biters = 1000, # number of bootstrap iterations
                        print_details = FALSE,
                        clustervars = "statefip", # cluster level
                        panel = TRUE) # whether the data is panel or repeated cross-sectional
```

```
## Warning in pre_process_did(yname = yname, tname = tname, idname = idname, : Be aware that there are s
##   Check groups: 2004,2005,2006.
```

```
## Warning in att_gt(yname = "vehicle_pc", tname = "year", idname = "statefip", :
## Not returning pre-test Wald statistic due to singular covariance matrix
```

```
agg_effects2 <- aggte(attvehicle_pc, type = "group")
summary(agg_effects2)
```

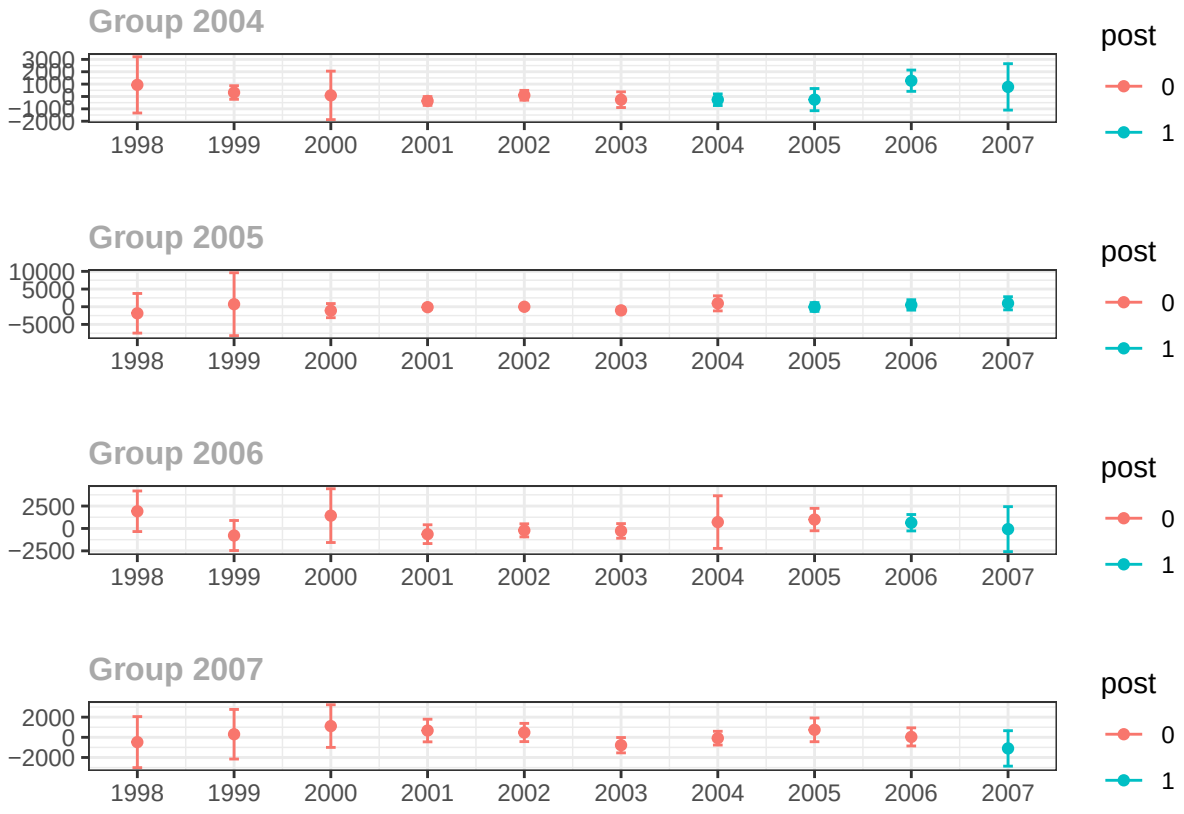
```
##
## Call:
## aggte(MP = attvehicle_pc, type = "group")
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
##
## Overall ATT:
##        ATT Std. Error     [95%  Conf. Int.]
##  -362.8026   518.1557 -1378.369    652.7639
##
##
## Group Effects:
##  group        ATT Std. Error [95% Simult.  Conf. Band]
##   2004   383.3749   290.3801     -220.5129    987.2626
##   2005   466.4450   347.7797     -256.8135   1189.7036
##   2006   282.0693   655.8051    -1081.7732   1645.9117
##   2007 -1101.1649   690.9537    -2538.1039    335.7740
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Group-time ATTs you want this
summary(attvehicle_pc)
```

```
##
## Call:
## att_gt(yname = "vehicle_pc", tname = "year", idname = "statefip",
##     gname = "First.Treat", xformla = NULL, data = CleanUPWork,
```

```
##     panel = TRUE, control_group = "nevertreated", bstrap = TRUE,
##     biters = 1000, clustervars = "statefip", est_method = "dr",
##     print_details = FALSE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
## Group-Time Average Treatment Effects:
##  Group Time   ATT(g,t) Std. Error [95% Simult.  Conf. Band]
##   2004 1998   938.3932   916.4889    -1335.0902   3211.8767
##   2004 1999   320.3350   221.8732     -230.0538    870.7237
##   2004 2000    88.3756   790.9027    -1873.5732   2050.3245
##   2004 2001  -363.9517   143.4938     -719.9088     -7.9946 *
##   2004 2002    96.5376   159.7472     -299.7385    492.8138
##   2004 2003  -259.3258   255.5534     -893.2632    374.6116
##   2004 2004  -262.4111   188.9513     -731.1323    206.3101
##   2004 2005  -253.8535   361.6735    -1151.0369    643.3300
##   2004 2006  1274.8873   346.8933      414.3681   2135.4065 *
##   2004 2007   774.8767   756.4066    -1101.4994   2651.2528
##   2005 1998 -1857.4579  2260.2678    -7464.3797   3749.4639
##   2005 1999   712.1704  3584.6084    -8179.9702   9604.3110
##   2005 2000 -1102.1523   806.1224    -3101.8557    897.5510
##   2005 2001  -123.1833   244.4140     -729.4875    483.1210
##   2005 2002   -16.7507   236.4096     -603.1989    569.6974
##   2005 2003 -1028.2411   314.1744    -1807.5962   -248.8860 *
##   2005 2004   950.9322   859.9615    -1182.3269   3084.1914
##   2005 2005   -77.2136   497.4313    -1311.1641   1156.7369
##   2005 2006   510.1732   591.5988     -957.3734   1977.7198
##   2005 2007   966.3755   750.5392     -895.4458   2828.1968
##   2006 1998  1917.9823   912.5548     -345.7421   4181.7067
##   2006 1999  -787.3771   675.5496    -2463.1757    888.4215
##   2006 2000  1430.0247  1208.4817    -1567.7894   4427.8388
##   2006 2001  -638.6061   422.2473    -1686.0517    408.8395
##   2006 2002  -214.3172   294.1412     -943.9770    515.3427
##   2006 2003  -274.6031   329.1090    -1091.0056    541.7994
##   2006 2004   709.1924  1183.6976    -2227.1411   3645.5259
##   2006 2005   994.2943   504.8213     -257.9880   2246.5766
##   2006 2006   641.1677   368.7931     -273.6770   1556.0124
##   2006 2007   -77.0292  1011.9072    -2587.2117   2433.1533
##   2007 1998  -476.5603  1020.0464    -3006.9333   2053.8127
##   2007 1999   306.3847   991.6128    -2153.4545   2766.2239
##   2007 2000  1114.0146   852.2467    -1000.1069   3228.1360
##   2007 2001   673.8871   452.7602     -449.2503   1797.0245
##   2007 2002   479.7150   364.4834     -424.4389   1383.8690
##   2007 2003  -780.4019   306.4819    -1540.6747    -20.1290 *
##   2007 2004   -83.7469   275.3043     -766.6792    599.1854
##   2007 2005   741.1353   474.2815     -435.3886   1917.6593
##   2007 2006    41.4850   361.4920     -855.2484    938.2184
##   2007 2007 -1101.1649   708.2893    -2858.1792    655.8493
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```r
# Plot group-time ATTs
ggdid(attvehicle_pc)
```

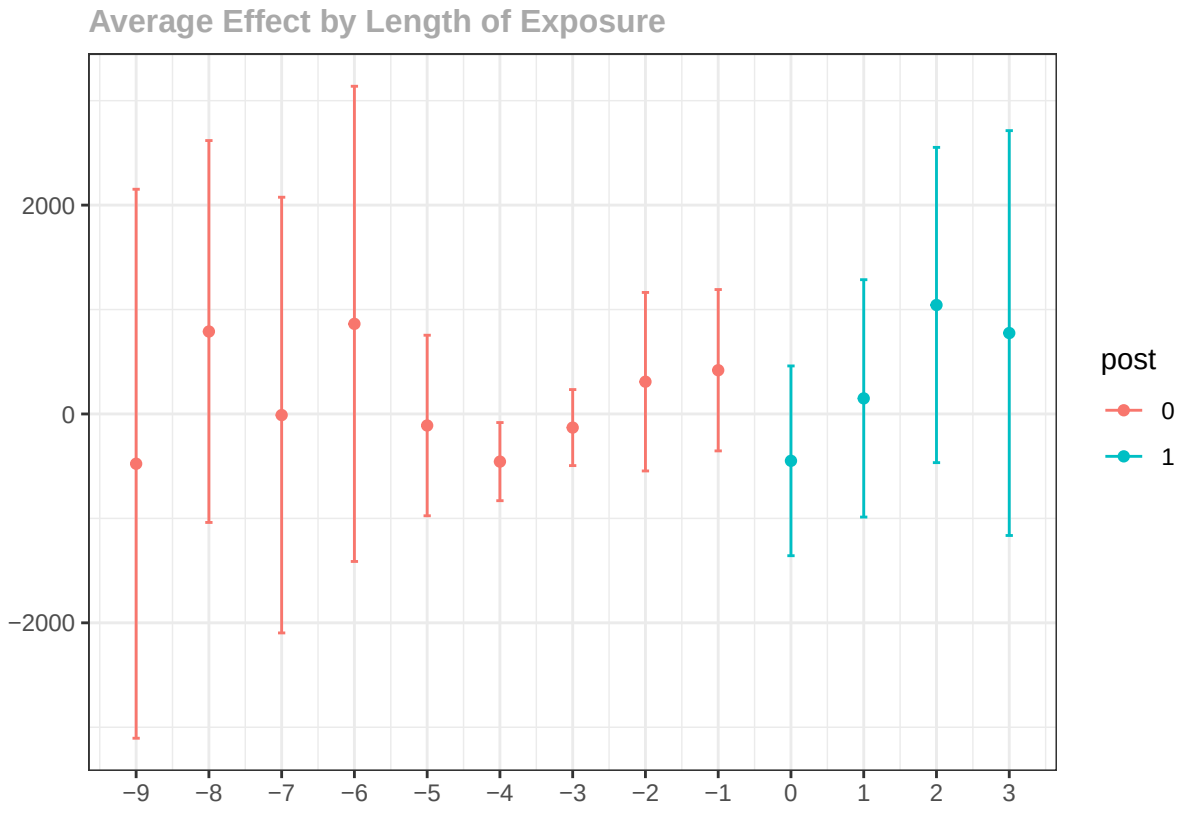



```r
# Event-study you want this
agg_effects_es2 <- aggte(attvehicle_pc, type = "dynamic", na.rm = TRUE)
summary(agg_effects_es2)
```

```
##
## Call:
## aggte(MP = attvehicle_pc, type = "dynamic", na.rm = TRUE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Tim
##
##
## Overall ATT:
##       ATT Std. Error     [95%  Conf. Int.]
##  379.8174   532.2074 -663.2899    1422.925
##
##
## Dynamic Effects:
##  event time       ATT Std. Error [95% Simult.  Conf. Band]
##          -9 -476.5603  1052.0889    -3105.0608   2151.9403
##          -8  789.8640   731.8962    -1038.6787   2618.4066
##          -7  -10.4925   835.0661    -2096.7911   2075.8061
##          -6  863.0134   910.7040    -1412.2562   3138.2831
```

```
##          -5 -110.2811   346.0195     -974.7634    754.2013
##          -4 -456.2099   149.7540     -830.3498    -82.0700 *
##          -3 -130.3030   145.7163     -494.3553    233.7494
##          -2  309.0956   342.0618     -545.4991   1163.6904
##          -1  419.0535   309.2743     -353.6261   1191.7331
##           0 -448.4788   363.6769    -1357.0758    460.1182
##           1  149.3684   454.8759     -987.0769   1285.8136
##           2 1043.5034   604.1386     -465.8544   2552.8612
##           3  774.8767   775.9090    -1163.6260   2713.3794
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
vehicle <- cbind(c(round(agg_effects_es2$overall.att, digits = 3), "(-165.03, 354.94)"))
# Plot event-study coefficients
ggdid(agg_effects_es2)
```




```
############################## burglary
attburglary_pc <- att_gt(yname = "burglary_pc", # LHS variable
                         tname = "year", # time variable
                         idname = "statefip", # id variable
                         gname = "First.Treat", # first treatment period variable
                         data = CleanUPWork, # data
```

```
                        xformla = NULL, # no covariates
                        #xformla = ~ l_police, # with covariates
                        est_method = "dr", # "dr" is doubly robust. "ipw" is inverse probability weight
                        control_group = "nevertreated", # set the comparison group which is either "nev
                        bstrap = TRUE, # if TRUE compute bootstrapped SE
                        biters = 1000, # number of bootstrap iterations
                        print_details = FALSE,
                        clustervars = "statefip", # cluster level
                        panel = TRUE) # whether the data is panel or repeated cross-sectional
```

```
## Warning in pre_process_did(yname = yname, tname = tname, idname = idname, : Be aware that there are s
##   Check groups: 2004,2005,2006.
```

```
## Warning in att_gt(yname = "burglary_pc", tname = "year", idname = "statefip", :
## Not returning pre-test Wald statistic due to singular covariance matrix
```

```
agg_effects3 <- aggte(attburglary_pc, type = "group")
summary(agg_effects3)
```

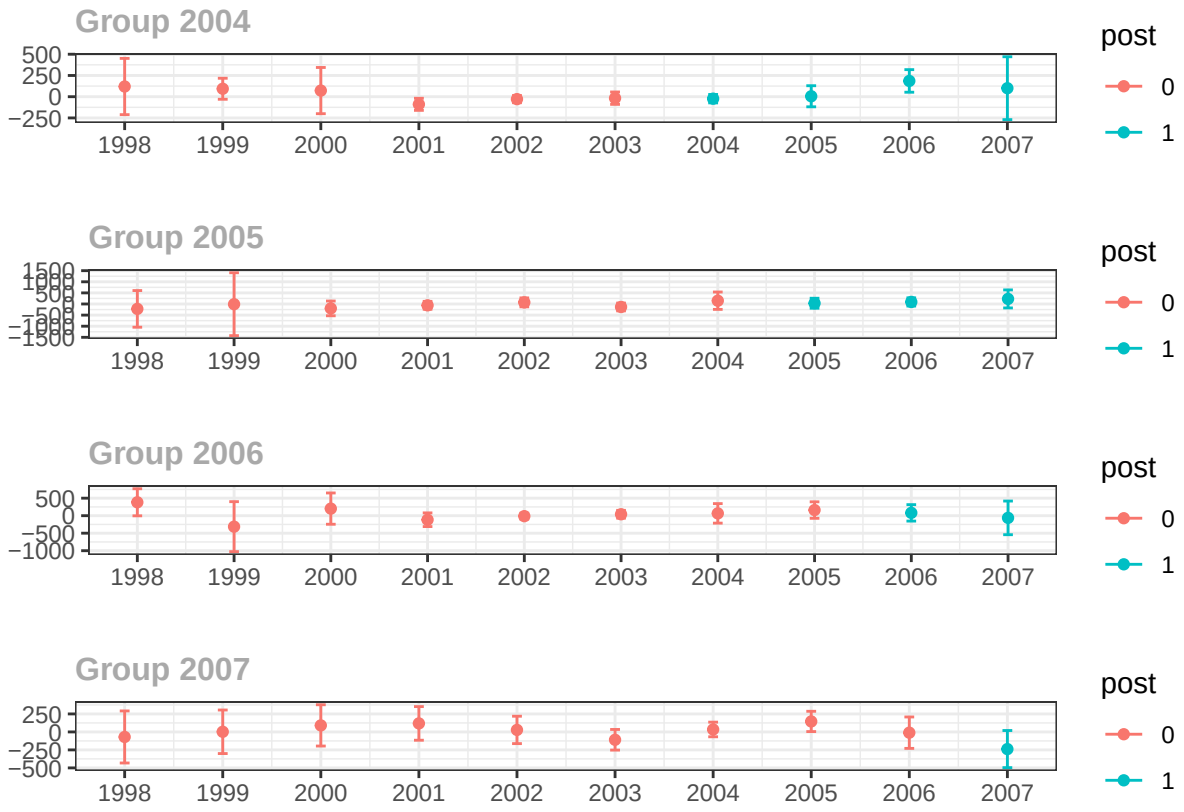
```
##
## Call:
## aggte(MP = attburglary_pc, type = "group")
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
##
## Overall ATT:
##       ATT Std. Error     [95%  Conf. Int.]
##  -87.1376    98.0568 -279.3254    105.0501
##
##
## Group Effects:
##  group       ATT Std. Error [95% Simult.  Conf. Band]
##   2004   66.8820    42.2199      -14.5571    148.3210
##   2005  118.5800    51.5182       19.2053    217.9547 *
##   2006    9.1159   143.7748     -268.2152    286.4469
##   2007 -238.5567   111.4566     -453.5483    -23.5650 *
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Group-time ATTs you want this
summary(attburglary_pc)
```

```
##
## Call:
## att_gt(yname = "burglary_pc", tname = "year", idname = "statefip",
##     gname = "First.Treat", xformla = NULL, data = CleanUPWork,
##     panel = TRUE, control_group = "nevertreated", bstrap = TRUE,
```

```
##     biters = 1000, clustervars = "statefip", est_method = "dr",
##     print_details = FALSE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
## Group-Time Average Treatment Effects:
##  Group Time  ATT(g,t) Std. Error [95% Simult.  Conf. Band]
##   2004 1998  119.9036   132.5863     -211.2794    451.0867
##   2004 1999   93.4513    49.4887      -30.1650    217.0676
##   2004 2000   71.9991   108.8877     -199.9879    343.9862
##   2004 2001  -89.6640    28.5150     -160.8908    -18.4372 *
##   2004 2002  -28.3058    16.9640      -70.6797     14.0682
##   2004 2003  -17.2737    29.1342      -90.0470     55.4996
##   2004 2004  -23.2527    19.8541      -72.8456     26.3401
##   2004 2005    5.1732    49.7294     -119.0443    129.3908
##   2004 2006  185.5939    53.2102       52.6819    318.5059 *
##   2004 2007  100.0135   148.1749     -270.1077    470.1346
##   2005 1998 -220.6921   330.2914    -1045.7163    604.3321
##   2005 1999   -9.5317   566.7487    -1425.1947   1406.1314
##   2005 2000 -197.9289   133.0103     -530.1710    134.3132
##   2005 2001  -59.7164    71.1339     -237.3995    117.9667
##   2005 2002   73.5062    80.5103     -127.5978    274.6102
##   2005 2003 -134.0334    70.2289     -309.4559     41.3891
##   2005 2004  147.9181   156.7594     -243.6461    539.4823
##   2005 2005   34.4918    89.7406     -189.6682    258.6518
##   2005 2006   92.3343    73.7975      -92.0020    276.6706
##   2005 2007  228.9138   162.5121     -177.0197    634.8474
##   2006 1998  382.4172   154.6240       -3.8130    768.6474
##   2006 1999 -313.2271   285.6736    -1026.8018    400.3475
##   2006 2000  201.8716   178.7027     -244.5040    648.2471
##   2006 2001 -115.7117    78.1811     -310.9978     79.5744
##   2006 2002  -13.3778    34.3310      -99.1321     72.3765
##   2006 2003   40.8332    44.4618      -70.2266    151.8929
##   2006 2004   66.0709   111.5507     -212.5681    344.7098
##   2006 2005  160.5395    94.3011      -75.0122    396.0913
##   2006 2006   80.7600    93.8530     -153.6722    315.1923
##   2006 2007  -62.5283   192.4056     -543.1320    418.0755
##   2007 1998  -70.0231   144.8310     -431.7919    291.7456
##   2007 1999    1.9346   121.1753     -300.7453    304.6146
##   2007 2000   90.6205   114.8319     -196.2144    377.4554
##   2007 2001  118.2044    93.5389     -115.4433    351.8522
##   2007 2002   27.8941    76.2029     -162.4506    218.2388
##   2007 2003 -109.1283    57.3794     -252.4543     34.1978
##   2007 2004   34.1493    40.7986      -67.7603    136.0589
##   2007 2005  145.7301    56.5192        4.5526    286.9076 *
##   2007 2006  -10.3690    87.4169     -228.7248    207.9868
##   2007 2007 -238.5567   103.2794     -496.5348     19.4215
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Plot group-time ATTs
ggdid(attburglary_pc)
```

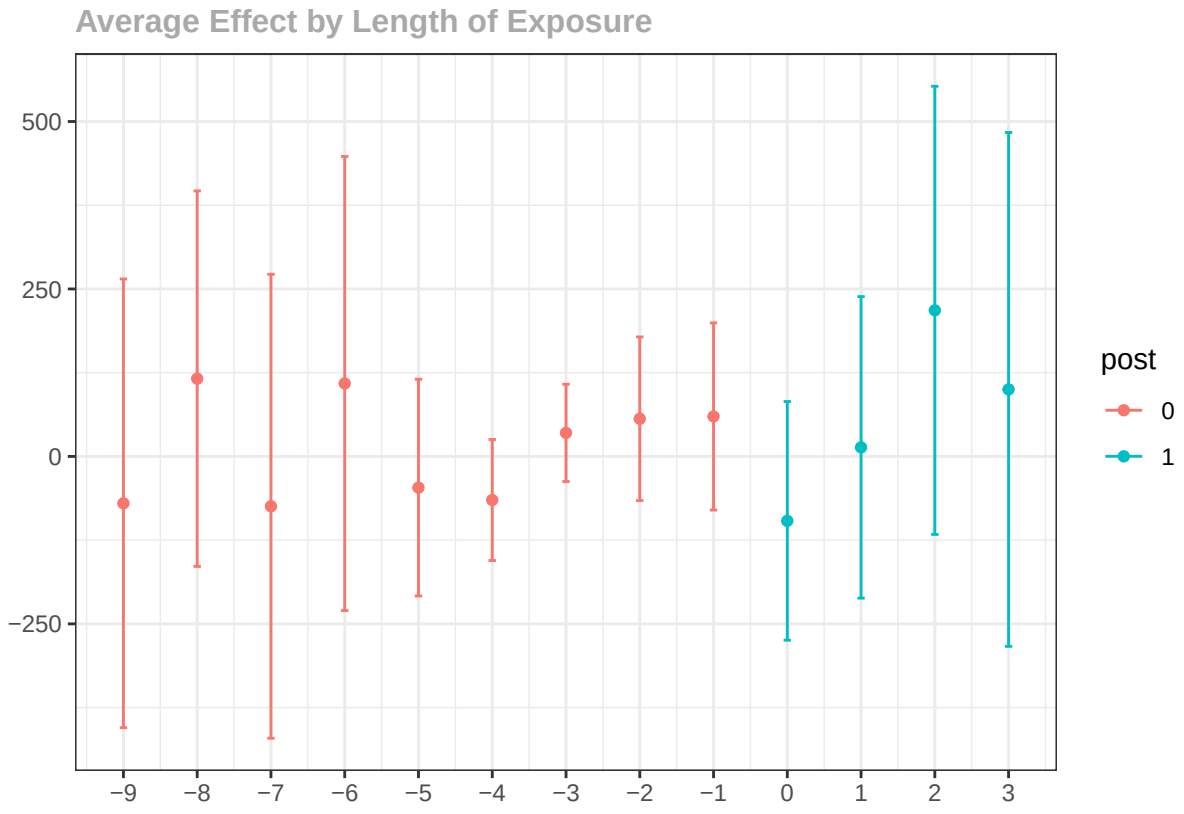



```
# Event-study you want this
agg_effects_es3 <- aggte(attburglary_pc, type = "dynamic", na.rm = TRUE)
summary(agg_effects_es3)
```

```
##
## Call:
## aggte(MP = attburglary_pc, type = "dynamic", na.rm = TRUE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Tim
##
##
## Overall ATT:
##     ATT Std. Error     [95%  Conf. Int.]
##  58.842   104.6027 -146.1756    263.8596
##
##
## Dynamic Effects:
##  event time      ATT Std. Error [95% Simult.  Conf. Band]
##          -9 -70.0231   133.4129     -404.9504    264.9041
##          -8 116.0794   111.6548     -164.2252    396.3839
##          -7 -74.4165   137.9474     -420.7274    271.8945
##          -6 108.8824   135.0260     -230.0944    447.8593
```

```
##          -5 -46.5866    64.4305     -208.3365    115.1634
##          -4 -65.0844    35.9925     -155.4421     25.2733
##          -3  35.1714    28.9173      -37.4241    107.7669
##          -2  56.2798    48.6453      -65.8421    178.4017
##          -1  59.6797    55.6139      -79.9365    199.2960
##           0 -96.2424    70.9649     -274.3968     81.9119
##           1  13.5131    89.6597     -211.5736    238.5997
##           2 218.0839   133.2603     -116.4601    552.6278
##           3 100.0135   152.8003     -283.5850    483.6119
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```r
burglary <- cbind(c(round(agg_effects_es3$overall.att, digits = 3), "(-37.72, 67.14)"))
# Plot event-study coefficients
ggdid(agg_effects_es3)
```




```r
############################## manslaughter
attmanslaughter_pc <- att_gt(yname = "manslaughter_pc", # LHS variable
                         tname = "year", # time variable
                         idname = "statefip", # id variable
                         gname = "First.Treat", # first treatment period variable
                         data = CleanUPWork, # data
```

```
                          xformla = NULL, # no covariates
                          #xformla = ~ l_police, # with covariates
                          est_method = "dr", # "dr" is doubly robust. "ipw" is inverse probability weigh
                          control_group = "nevertreated", # set the comparison group which is either "ne
                          bstrap = TRUE, # if TRUE compute bootstrapped SE
                          biters = 1000, # number of bootstrap iterations
                          print_details = FALSE,
                          clustervars = "statefip", # cluster level
                          panel = TRUE) # whether the data is panel or repeated cross-sectional
```

```
## Warning in pre_process_did(yname = yname, tname = tname, idname = idname, : Be aware that there are s
##   Check groups: 2004,2005,2006.
```

```
## Warning in att_gt(yname = "manslaughter_pc", tname = "year", idname =
## "statefip", : Not returning pre-test Wald statistic due to singular covariance
## matrix
```

```
agg_effects4 <- aggte(attmanslaughter_pc, type = "group")
summary(agg_effects4)
```

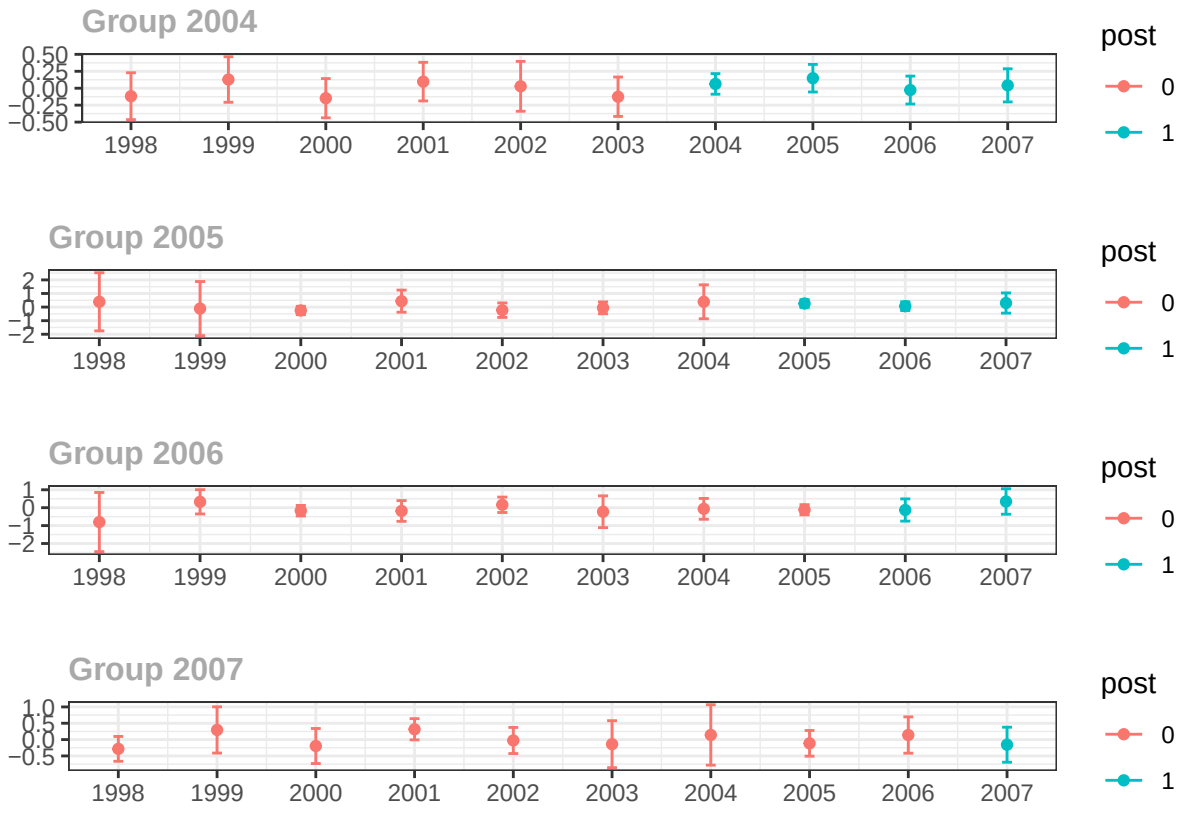
```
##
## Call:
## aggte(MP = attmanslaughter_pc, type = "group")
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
##
## Overall ATT:
##      ATT Std. Error     [95%  Conf. Int.]
##  -0.0062      0.122   -0.2454      0.2329
##
##
## Group Effects:
##  group     ATT Std. Error [95% Simult.  Conf. Band]
##   2004  0.0566     0.0497       -0.0483      0.1615
##   2005  0.2090     0.1621       -0.1332      0.5511
##   2006  0.1086     0.1905       -0.2934      0.5106
##   2007 -0.1566     0.1941       -0.5663      0.2531
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Group-time ATTs you want this
summary(attmanslaughter_pc)
```

```
##
## Call:
## att_gt(yname = "manslaughter_pc", tname = "year", idname = "statefip",
##     gname = "First.Treat", xformla = NULL, data = CleanUPWork,
```

```
##     panel = TRUE, control_group = "nevertreated", bstrap = TRUE,
##     biters = 1000, clustervars = "statefip", est_method = "dr",
##     print_details = FALSE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
## Group-Time Average Treatment Effects:
##  Group Time ATT(g,t) Std. Error [95% Simult.  Conf. Band]
##   2004 1998  -0.1176     0.1343       -0.4638      0.2286
##   2004 1999   0.1284     0.1303       -0.2075      0.4642
##   2004 2000  -0.1475     0.1123       -0.4369      0.1419
##   2004 2001   0.0971     0.1106       -0.1879      0.3821
##   2004 2002   0.0280     0.1428       -0.3401      0.3961
##   2004 2003  -0.1257     0.1129       -0.4167      0.1653
##   2004 2004   0.0636     0.0590       -0.0883      0.2156
##   2004 2005   0.1478     0.0790       -0.0557      0.3514
##   2004 2006  -0.0272     0.0798       -0.2330      0.1786
##   2004 2007   0.0422     0.0947       -0.2019      0.2863
##   2005 1998   0.3873     0.8291       -1.7497      2.5244
##   2005 1999  -0.1110     0.7724       -2.1018      1.8798
##   2005 2000  -0.2502     0.1185       -0.5556      0.0552
##   2005 2001   0.4350     0.3160       -0.3795      1.2494
##   2005 2002  -0.2269     0.2071       -0.7606      0.3069
##   2005 2003  -0.0565     0.1694       -0.4933      0.3802
##   2005 2004   0.3894     0.4846       -0.8596      1.6384
##   2005 2005   0.2622     0.1098       -0.0207      0.5451
##   2005 2006   0.0665     0.1240       -0.2532      0.3861
##   2005 2007   0.2983     0.2884       -0.4450      1.0416
##   2006 1998  -0.8016     0.6410       -2.4537      0.8506
##   2006 1999   0.3279     0.2628       -0.3496      1.0054
##   2006 2000  -0.1681     0.1141       -0.4623      0.1260
##   2006 2001  -0.1821     0.2244       -0.7605      0.3963
##   2006 2002   0.1622     0.1670       -0.2682      0.5925
##   2006 2003  -0.2254     0.3439       -1.1118      0.6611
##   2006 2004  -0.0649     0.2257       -0.6466      0.5168
##   2006 2005  -0.1158     0.1100       -0.3994      0.1678
##   2006 2006  -0.1287     0.2403       -0.7482      0.4908
##   2006 2007   0.3458     0.2756       -0.3646      1.0563
##   2007 1998  -0.2835     0.1475       -0.6638      0.0968
##   2007 1999   0.2955     0.2744       -0.4118      1.0028
##   2007 2000  -0.1962     0.2081       -0.7325      0.3401
##   2007 2001   0.3163     0.1258       -0.0079      0.6405
##   2007 2002  -0.0273     0.1550       -0.4267      0.3721
##   2007 2003  -0.1400     0.2786       -0.8582      0.5782
##   2007 2004   0.1416     0.3584       -0.7823      1.0655
##   2007 2005  -0.1145     0.1525       -0.5075      0.2786
##   2007 2006   0.1398     0.2154       -0.4155      0.6951
##   2007 2007  -0.1566     0.2078       -0.6922      0.3790
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Plot group-time ATTs
ggdid(attmanslaughter_pc)
```

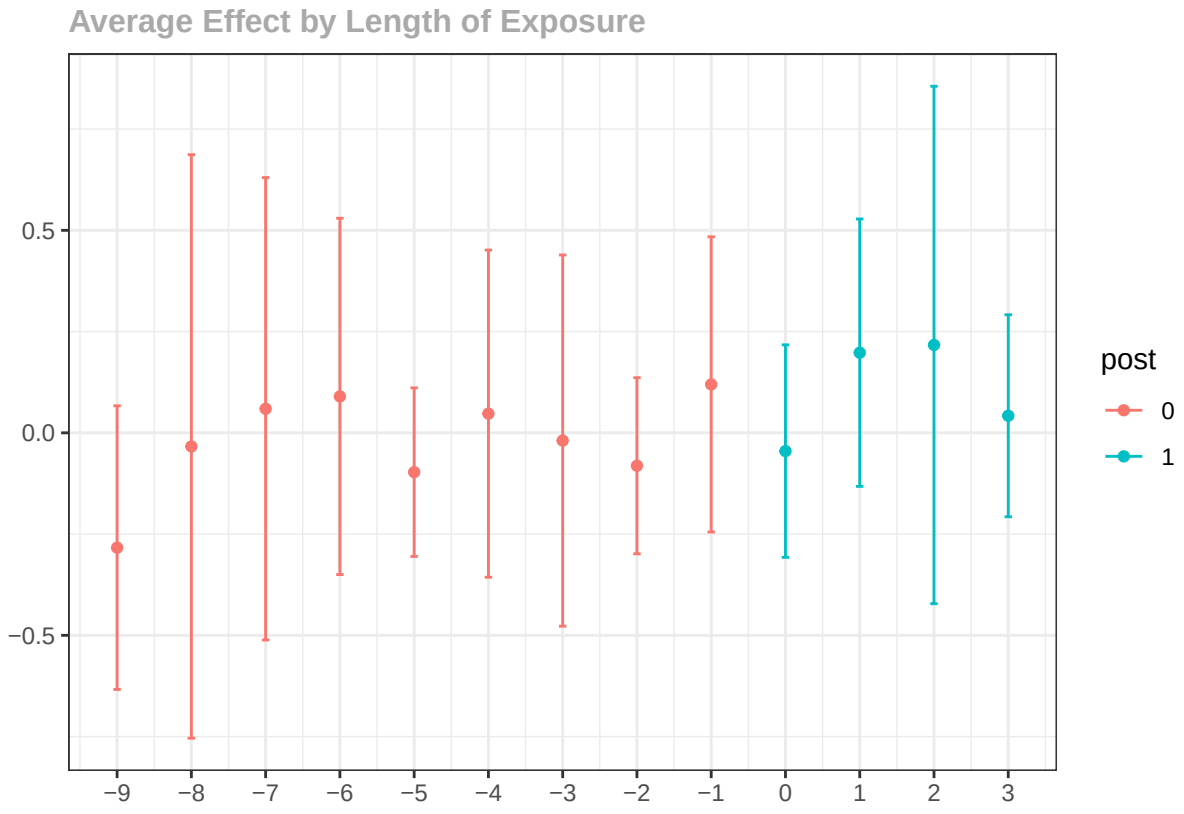



```
# Event-study you want this
agg_effects_es4 <- aggte(attmanslaughter_pc, type = "dynamic", na.rm = TRUE)
summary(agg_effects_es4)
```

```
##
## Call:
## aggte(MP = attmanslaughter_pc, type = "dynamic", na.rm = TRUE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Tim
##
##
## Overall ATT:
##     ATT Std. Error     [95%  Conf. Int.]
##  0.1029     0.0988   -0.0906       0.2965
##
##
## Dynamic Effects:
##  event time     ATT Std. Error [95% Simult.  Conf. Band]
##          -9 -0.2835     0.1440       -0.6337       0.0667
##          -8 -0.0336     0.2963       -0.7540       0.6868
##          -7  0.0594     0.2348       -0.5115       0.6302
##          -6  0.0899     0.1809       -0.3500       0.5298
```

```
##          -5 -0.0971     0.0856       -0.3052      0.1110
##          -4  0.0474     0.1661       -0.3565      0.4513
##          -3 -0.0192     0.1885       -0.4775      0.4391
##          -2 -0.0812     0.0894       -0.2986      0.1361
##          -1  0.1196     0.1499       -0.2449      0.4840
##           0 -0.0451     0.1079       -0.3075      0.2172
##           1  0.1978     0.1358       -0.1323      0.5279
##           2  0.2169     0.2627       -0.4219      0.8557
##           3  0.0422     0.1026       -0.2072      0.2916
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
manslaughter <- cbind(c(round(agg_effects_es4$overall.att, digits = 3), "(-0.024, 0.076)"))
# Plot event-study coefficients
ggdid(agg_effects_es4)
```




```
############################## robbery
attrobbery_pc <- att_gt(yname = "robbery_pc", # LHS variable
                        tname = "year", # time variable
                        idname = "statefip", # id variable
                        gname = "First.Treat", # first treatment period variable
                        data = CleanUPWork, # data
```

```
                              xformla = NULL, # no covariates
                              #xformla = ~ l_police, # with covariates
                              est_method = "dr", # "dr" is doubly robust. "ipw" is inverse probability w
                              control_group = "nevertreated", # set the comparison group which is either
                              bstrap = TRUE, # if TRUE compute bootstrapped SE
                              biters = 1000, # number of bootstrap iterations
                              print_details = FALSE,
                              clustervars = "statefip", # cluster level
                              panel = TRUE) # whether the data is panel or repeated cross-sectional
```

```
## Warning in pre_process_did(yname = yname, tname = tname, idname = idname, : Be aware that there are s
##   Check groups: 2004,2005,2006.
```

```
## Warning in att_gt(yname = "robbery_pc", tname = "year", idname = "statefip", :
## Not returning pre-test Wald statistic due to singular covariance matrix
```

```
agg_effects5 <- aggte(attrobbery_pc, type = "group")
summary(agg_effects5)
```

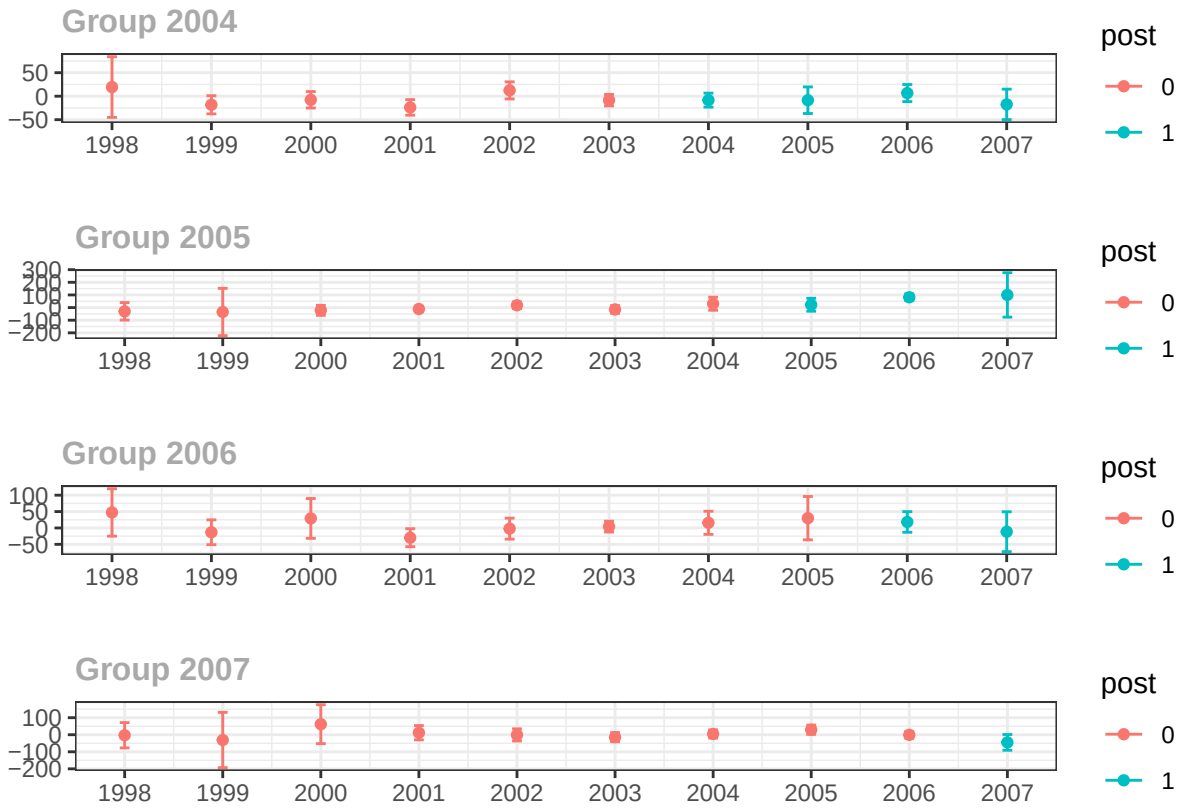
```
##
## Call:
## aggte(MP = attrobbery_pc, type = "group")
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
##
## Overall ATT:
##      ATT Std. Error     [95%  Conf. Int.]
##  -7.6192    12.6667  -32.4454      17.207
##
##
## Group Effects:
##  group      ATT Std. Error [95% Simult.  Conf. Band]
##   2004  -6.9434     4.9161      -17.2973      3.4104
##   2005  67.8988    15.4414       35.3775    100.4201 *
##   2006   3.4081    15.5008      -29.2385     36.0547
##   2007 -44.8065    18.1459      -83.0239     -6.5891 *
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Group-time ATTs you want this
summary(attrobbery_pc)
```

```
##
## Call:
## att_gt(yname = "robbery_pc", tname = "year", idname = "statefip",
##     gname = "First.Treat", xformla = NULL, data = CleanUPWork,
##     panel = TRUE, control_group = "nevertreated", bstrap = TRUE,
```

```
##     biters = 1000, clustervars = "statefip", est_method = "dr",
##     print_details = FALSE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
## Group-Time Average Treatment Effects:
##  Group Time ATT(g,t) Std. Error [95% Simult.  Conf. Band]
##   2004 1998  19.3998    25.4903      -45.1166     83.9161
##   2004 1999 -18.2901     7.6465      -37.6434      1.0632
##   2004 2000  -7.6364     6.9210      -25.1535      9.8806
##   2004 2001 -23.8811     6.5422      -40.4394     -7.3229 *
##   2004 2002  12.3780     7.1743       -5.7802     30.5362
##   2004 2003  -8.4329     4.8298      -20.6571      3.7913
##   2004 2004  -8.3793     5.8893      -23.2851      6.5265
##   2004 2005  -8.5798    11.1983      -36.9229     19.7632
##   2004 2006   6.6695     7.1910      -11.5310     24.8701
##   2004 2007 -17.4840    12.8164      -49.9226     14.9545
##   2005 1998 -29.6895    27.3546      -98.9243     39.5454
##   2005 1999 -34.8993    73.9729     -222.1253    152.3267
##   2005 2000 -21.6959    15.6592      -61.3294     17.9377
##   2005 2001 -11.2248     8.7406      -33.3474     10.8977
##   2005 2002  18.0991    10.4393       -8.3229     44.5211
##   2005 2003 -14.9246    11.9092      -45.0670     15.2178
##   2005 2004  30.3476    20.4609      -21.4392     82.1343
##   2005 2005  22.3007    20.1476      -28.6932     73.2945
##   2005 2006  81.5644    10.5750       54.7990    108.3299 *
##   2005 2007  99.8313    69.3645      -75.7309    275.3934
##   2006 1998  47.3153    28.5686      -24.9920    119.6226
##   2006 1999 -13.2033    14.9920      -51.1481     24.7416
##   2006 2000  29.0711    24.0058      -31.6879     89.8301
##   2006 2001 -29.8007    10.8749      -57.3251     -2.2763 *
##   2006 2002  -2.0914    12.6162      -34.0231     29.8404
##   2006 2003   4.0799     6.5230      -12.4300     20.5897
##   2006 2004  15.6721    13.9619      -19.6656     51.0098
##   2006 2005  29.8936    26.1386      -36.2634     96.0506
##   2006 2006  18.3449    12.4383      -13.1365     49.8263
##   2006 2007 -11.5287    24.0300      -72.3488     49.2914
##   2007 1998  -2.9335    29.3183      -77.1384     71.2713
##   2007 1999 -30.9257    64.0184     -192.9568    131.1055
##   2007 2000  61.7661    45.0589      -52.2785    175.8107
##   2007 2001  11.9188    16.5722      -30.0255     53.8632
##   2007 2002  -0.9525    14.0422      -36.4934     34.5885
##   2007 2003 -14.2022    10.5142      -40.8138     12.4095
##   2007 2004   4.5064     9.4408      -19.3883     28.4011
##   2007 2005  29.4135    10.7538        2.1955     56.6315 *
##   2007 2006  -0.5993     8.0831      -21.0578     19.8592
##   2007 2007 -44.8065    18.2251      -90.9345      1.3214
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Plot group-time ATTs
ggdid(attrobbery_pc)
```

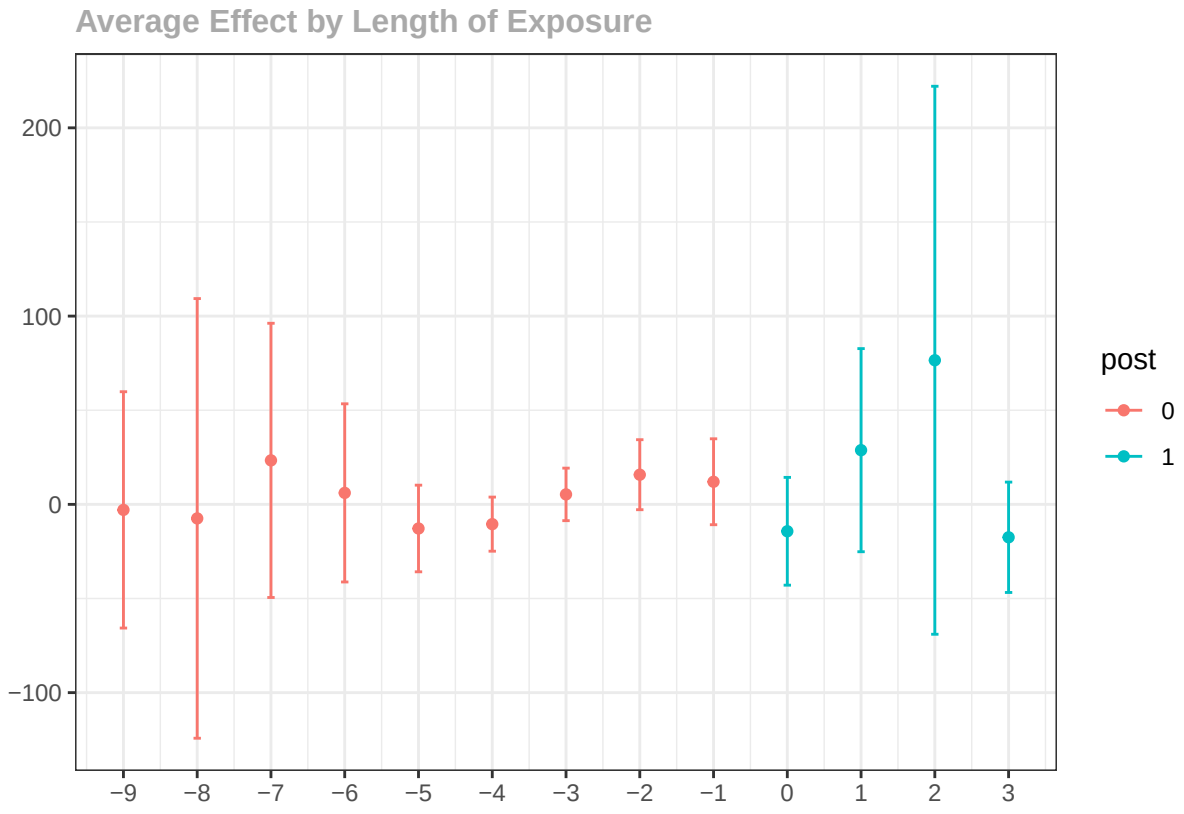



```
# Event-study you want this
agg_effects_es5 <- aggte(attrobbery_pc, type = "dynamic", na.rm = TRUE)
summary(agg_effects_es5)
```

```
##
## Call:
## aggte(MP = attrobbery_pc, type = "dynamic", na.rm = TRUE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Tim
##
##
## Overall ATT:
##      ATT Std. Error     [95%  Conf. Int.]
##  18.3886    18.2648  -17.4096     54.1869
##
##
## Dynamic Effects:
##  event time      ATT Std. Error [95% Simult.  Conf. Band]
##          -9  -2.9335    25.9652      -65.6897     59.8227
##          -8  -7.4534    48.3093     -124.2139    109.3072
##          -7  23.3603    30.1312      -49.4648     96.1855
##          -6   6.0962    19.5772      -41.2207     53.4131
```

```
##          -5 -12.8176     9.5196      -35.8259     10.1906
##          -4 -10.5000     5.9443      -24.8670      3.8670
##          -3   5.3000     5.7723       -8.6514     19.2514
##          -2  15.7511     7.6914       -2.8386     34.3407
##          -1  12.0068     9.4395      -10.8078     34.8214
##           0 -14.2920    11.8463      -42.9238     14.3398
##           1  28.7896    22.3170      -25.1491     82.7283
##           2  76.5409    60.2144      -68.9937    222.0754
##           3 -17.4840    12.1262      -46.7923     11.8243
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
robbery <- cbind(c(round(agg_effects_es4$overall.att, digits = 3), "(-4.37, 13.57)"))
# Plot event-study coefficients
ggdid(agg_effects_es5)
```




```
############################## murder
attmurder_pc<- att_gt(yname = "murder_pc", # LHS variable
                      tname = "year", # time variable
                      idname = "statefip", # id variable
                      gname = "First.Treat", # first treatment period variable
                      data = CleanUPWork, # data
```

```
                        xformla = NULL, # no covariates
                        #xformla = ~ l_police, # with covariates
                        est_method = "dr", # "dr" is doubly robust. "ipw" is inverse probability weight
                        control_group = "nevertreated", # set the comparison group which is either "nev
                        bstrap = TRUE, # if TRUE compute bootstrapped SE
                        biters = 1000, # number of bootstrap iterations
                        print_details = FALSE,
                        clustervars = "statefip", # cluster level
                        panel = TRUE) # whether the data is panel or repeated cross-sectional
```

```
## Warning in pre_process_did(yname = yname, tname = tname, idname = idname, : Be aware that there are s
##   Check groups: 2004,2005,2006.
```

```
## Warning in att_gt(yname = "murder_pc", tname = "year", idname = "statefip", :
## Not returning pre-test Wald statistic due to singular covariance matrix
```

```
agg_effects6 <- aggte(attmurder_pc, type = "group")
summary(agg_effects6)
```

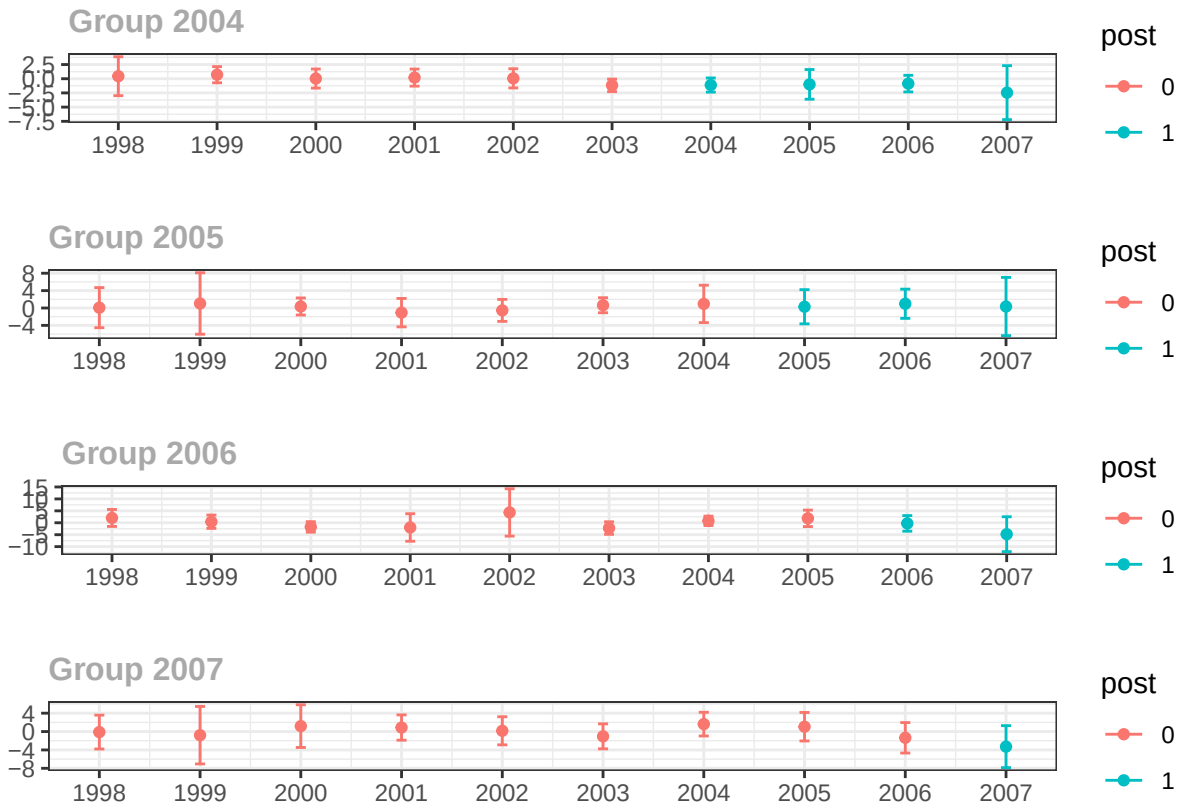
```
##
## Call:
## aggte(MP = attmurder_pc, type = "group")
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
##
## Overall ATT:
##      ATT Std. Error     [95%  Conf. Int.]
##  -2.1685     1.4519   -5.0142      0.6772
##
##
## Group Effects:
##  group     ATT Std. Error [95% Simult.  Conf. Band]
##   2004 -1.3548     0.4508       -2.2387     -0.4709 *
##   2005  0.5344     0.8829       -1.1965      2.2654
##   2006 -2.5312     2.1551       -6.7563      1.6940
##   2007 -3.2878     1.8283       -6.8722      0.2966
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Group-time ATTs you want this
summary(attmurder_pc)
```

```
##
## Call:
## att_gt(yname = "murder_pc", tname = "year", idname = "statefip",
##     gname = "First.Treat", xformla = NULL, data = CleanUPWork,
##     panel = TRUE, control_group = "nevertreated", bstrap = TRUE,
```

```
##     biters = 1000, clustervars = "statefip", est_method = "dr",
##     print_details = FALSE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Time
##
## Group-Time Average Treatment Effects:
##  Group Time ATT(g,t) Std. Error [95% Simult.  Conf. Band]
##   2004 1998   0.4420     1.3740       -2.9834      3.8673
##   2004 1999   0.7089     0.5712       -0.7153      2.1330
##   2004 2000   0.0300     0.6753       -1.6536      1.7137
##   2004 2001   0.2004     0.6029       -1.3028      1.7035
##   2004 2002   0.0638     0.6779       -1.6261      1.7537
##   2004 2003  -1.1696     0.4428       -2.2735     -0.0657 *
##   2004 2004  -1.1102     0.5005       -2.3580      0.1377
##   2004 2005  -0.9938     1.0486       -3.6081      1.6205
##   2004 2006  -0.8618     0.5856       -2.3218      0.5982
##   2004 2007  -2.4534     1.9065       -7.2064      2.2997
##   2005 1998   0.0800     1.8529       -4.5395      4.6994
##   2005 1999   1.0354     2.8379       -6.0397      8.1105
##   2005 2000   0.3482     0.7880       -1.6163      2.3127
##   2005 2001  -1.0693     1.3118       -4.3398      2.2012
##   2005 2002  -0.5480     1.0141       -3.0763      1.9803
##   2005 2003   0.6353     0.6933       -1.0931      2.3636
##   2005 2004   0.9439     1.7267       -3.3609      5.2487
##   2005 2005   0.2883     1.5784       -3.6467      4.2233
##   2005 2006   0.9757     1.3478       -2.3845      4.3358
##   2005 2007   0.3393     2.6887       -6.3637      7.0422
##   2006 1998   2.0149     1.4251       -1.5379      5.5677
##   2006 1999   0.4383     1.1193       -2.3522      3.2288
##   2006 2000  -1.7447     0.8796       -3.9376      0.4482
##   2006 2001  -1.9709     2.3137       -7.7390      3.7972
##   2006 2002   4.3295     3.9794       -5.5912     14.2503
##   2006 2003  -2.2205     1.0541       -4.8484      0.4074
##   2006 2004   0.8162     0.7914       -1.1568      2.7892
##   2006 2005   1.8555     1.3839       -1.5946      5.3055
##   2006 2006  -0.2675     1.3085       -3.5296      2.9946
##   2006 2007  -4.7948     2.9317      -12.1038      2.5141
##   2007 1998  -0.1116     1.4793       -3.7996      3.5764
##   2007 1999  -0.7911     2.5093       -7.0468      5.4646
##   2007 2000   1.1836     1.8655       -3.4672      5.8344
##   2007 2001   0.8755     1.1042       -1.8773      3.6283
##   2007 2002   0.1665     1.2273       -2.8931      3.2261
##   2007 2003  -1.0427     1.0916       -3.7640      1.6786
##   2007 2004   1.6219     1.0343       -0.9566      4.2004
##   2007 2005   1.0581     1.2434       -2.0419      4.1581
##   2007 2006  -1.3574     1.3294       -4.6717      1.9569
##   2007 2007  -3.2878     1.8333       -7.8582      1.2827
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
# Plot group-time ATTs
ggdid(attmurder_pc)
```



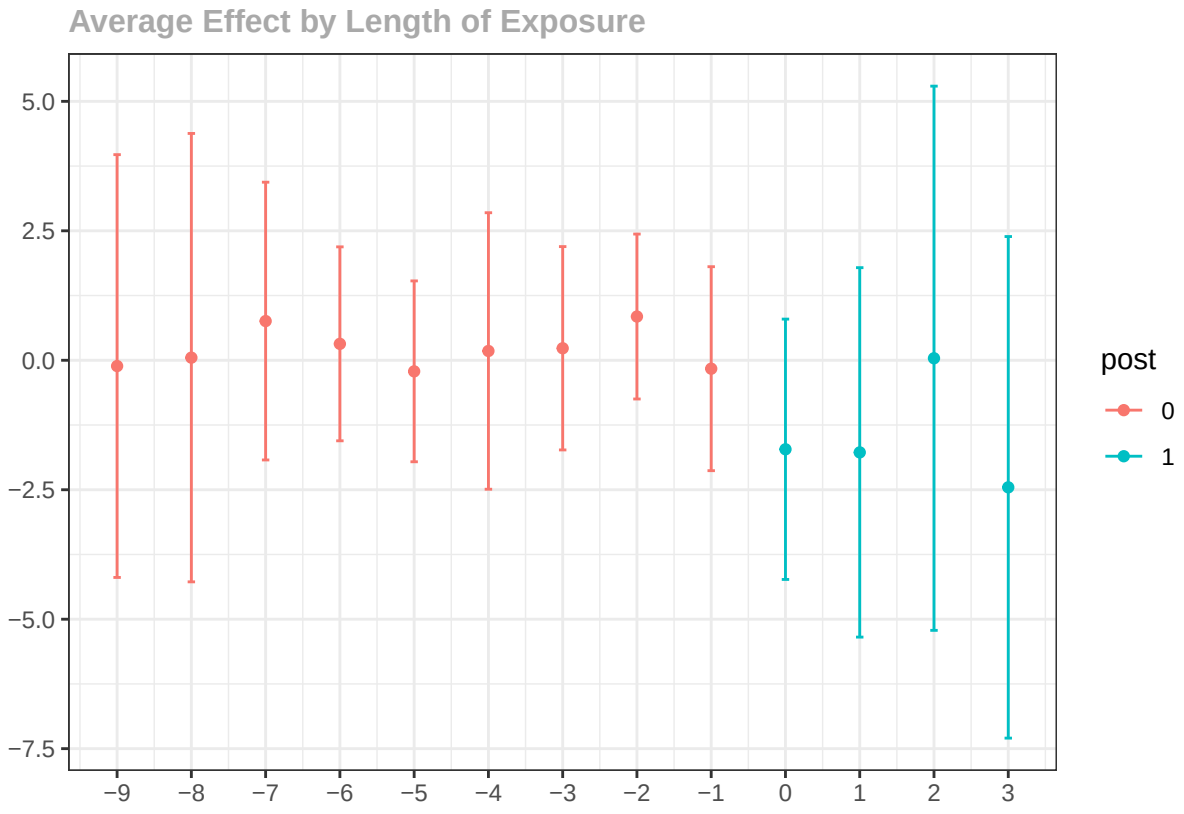

```
# Event-study you want this
agg_effects_es6 <- aggte(attmurder_pc, type = "dynamic", na.rm = TRUE)
summary(agg_effects_es6)
```

```
##
## Call:
## aggte(MP = attmurder_pc, type = "dynamic", na.rm = TRUE)
##
## Reference: Callaway, Brantly and Pedro H.C. Sant'Anna.  "Difference-in-Differences with Multiple Tim
##
##
## Overall ATT:
##     ATT Std. Error     [95%  Conf. Int.]
##  -1.478     1.4428   -4.3058      1.3499
##
##
## Dynamic Effects:
##  event time     ATT Std. Error [95% Simult.  Conf. Band]
##          -9 -0.1116     1.6436       -4.1936      3.9705
##          -8  0.0507     1.7433       -4.2788      4.3802
##          -7  0.7569     1.0798       -1.9248      3.4387
##          -6  0.3173     0.7540       -1.5554      2.1900
```

```
##          -5 -0.2138     0.7031       -1.9601      1.5324
##          -4  0.1794     1.0749       -2.4902      2.8490
##          -3  0.2320     0.7905       -1.7313      2.1953
##          -2  0.8446     0.6413       -0.7479      2.4372
##          -1 -0.1624     0.7930       -2.1318      1.8071
##           0 -1.7187     1.0121       -4.2324      0.7949
##           1 -1.7788     1.4363       -5.3459      1.7884
##           2  0.0390     2.1158       -5.2156      5.2936
##           3 -2.4534     1.9500       -7.2962      2.3895
## ---
## Signif. codes: '*' confidence band does not cover 0
##
## Control Group:  Never Treated,  Anticipation Periods:  0
## Estimation Method:  Doubly Robust
```

```
murder <- cbind(c(round(agg_effects_es6$overall.att, digits = 3), "(-1.05,0.31)"))

# Plot event-study coefficients
ggdid(agg_effects_es6)
```




```
Description <- rbind("Overall ATT", "95% CI")
Table <- cbind(Description,Murder = c(murder), Manslaughter = c(manslaughter), Rape = c(rape), Vehicle =
```

```
kbl(Table,format = "latex", caption = "Minimum Wage Aggreagted Treatment Effect Estimates", booktabs =T
add_header_above(c(" ","Violent Crimes"=3,"Non-Violent Crimes"=4))  %>%
  kable_styling(latex_options =c("striped","hold_position")) %>%
  row_spec(0:2,align = "c")
```

Table 1: Minimum Wage Aggreagted Treatment Effect Estimates

	Violent Crimes			Non-Violent Crimes			
	Murder	Manslaughter	Rape	Vehicle	Robbery	Larceny	Burg
Overall ATT	-1.478	0.103	-13.414	379.817	0.103	482.794	58.
95% CI	(-1.05,0.31)	(-0.024, 0.076)	(-9.37, 2.67)	(-165.03, 354.94)	(-4.37, 13.57)	(14.11, 227.28)*	(-37.72