econ490

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Import bank-wise data in the test group and the control group from Bloomberg and clean the data

The test set is as follow

```
## # A tibble: 3 x 6
##   date                  roe  t1cr bank  country  test
##   <dttm>              <dbl> <dbl> <chr> <chr>   <dbl>
## 1 2024-12-31 00:00:00  14.1  14.6 rbc   Canada      1
## 2 2024-09-30 00:00:00  14.2  14.5 rbc   Canada      1
## 3 2024-06-30 00:00:00  14.0  14.1 rbc   Canada      1
```

And the control set is as follow
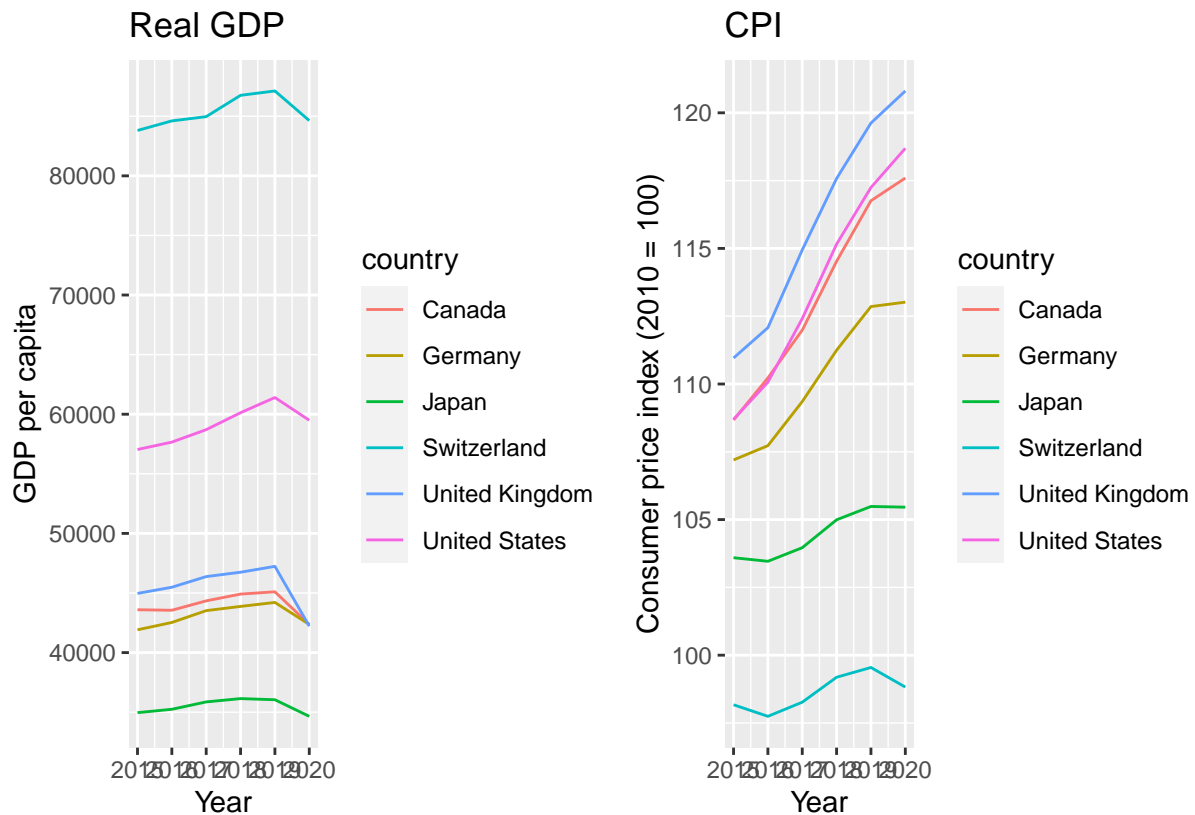
```
## # A tibble: 3 x 6
##   date                  roe  t1cr bank  country         test
##   <dttm>              <dbl> <dbl> <chr> <chr>          <dbl>
## 1 2024-12-31 00:00:00  5.94  17.6 ubs   United States      0
## 2 2024-09-30 00:00:00  4.70  17.5 ubs   United States      0
## 3 2024-06-30 00:00:00  2.22  18   ubs   United States      0
```

Import Marco Data from World Bank, including GDP and CPI

```
##           country        year          gdp            cpi
##  Canada        :6   Min.   :2015   Min.   :34651   Min.   : 97.75
##  Germany       :6   1st Qu.:2016   1st Qu.:42365   1st Qu.:104.74
##  Japan         :6   Median :2018   Median :44936   Median :110.15
##  Switzerland   :6   Mean   :2018   Mean   :52069   Mean   :109.39
##  United Kingdom:6   3rd Qu.:2019   3rd Qu.:58901   3rd Qu.:114.63
##  United States :6   Max.   :2020   Max.   :87124   Max.   :120.81
```

Let's visualize the macro data

Import the indcies in the main stock exchanges in the countries we have

```
##    exchange     stock_idx            country              year
##  DAX  :41    Min.   :-19.269    Length:246         Min.   :2015
##  NKY  :41    1st Qu.:  6.186    Class :character   1st Qu.:2017
##  SMI  :41    Median : 28.349    Mode  :character   Median :2020
##  SPTSX:41    Mean   : 41.882                       Mean   :2020
##  SPX  :41    3rd Qu.: 63.936                       3rd Qu.:2022
##  UKX  :41    Max.   :245.307                       Max.   :2025
##      month
##  Min.   : 2.000
##  1st Qu.: 3.000
##  Median : 6.000
##  Mean   : 7.366
##  3rd Qu.: 9.000
##  Max.   :12.000
```

Integrate bank-wise, macro data & stock index

```
##       date                            roe               t1cr
##  Min.   :2015-03-31 00:00:00    Min.   :-13.303    Min.   :11.20
##  1st Qu.:2016-06-30 00:00:00    1st Qu.:  4.818    1st Qu.:12.57
```
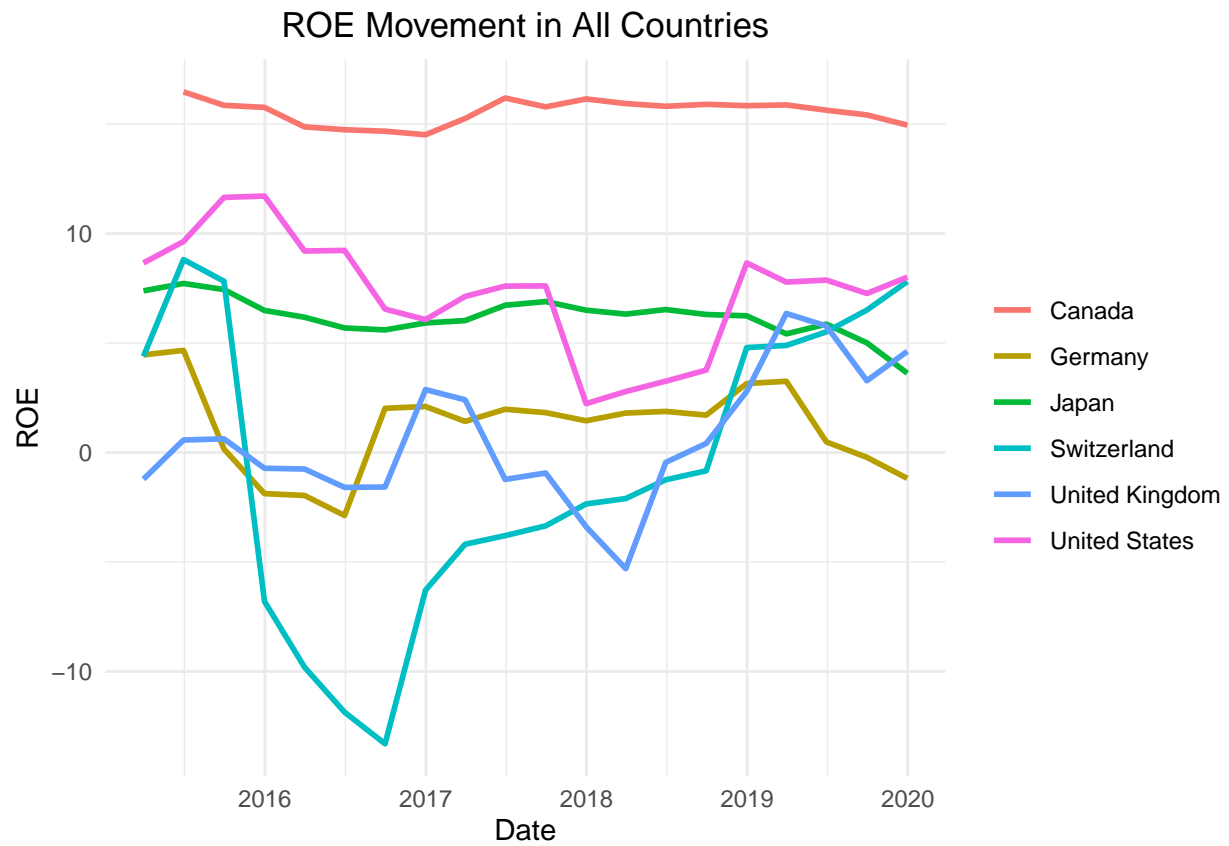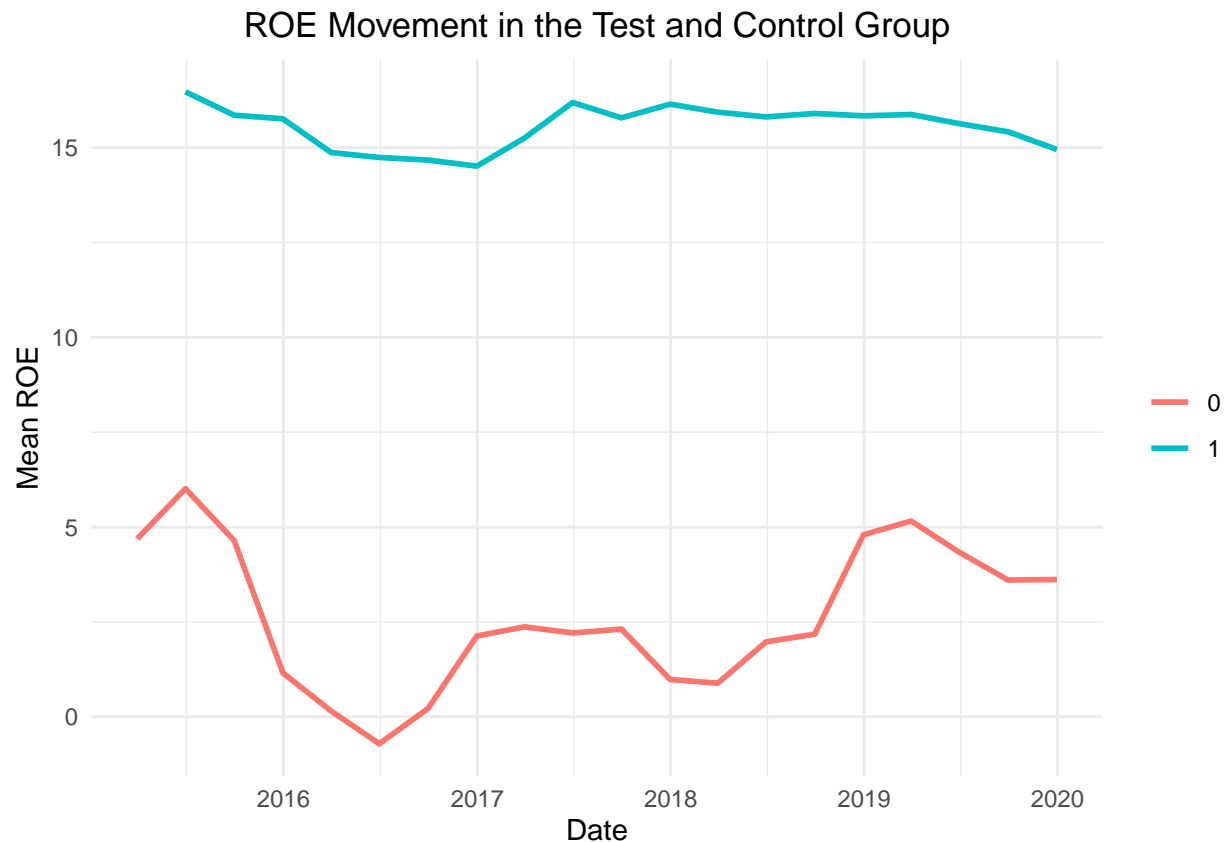
```
##  Median :2017-09-30 00:00:00   Median :  9.434   Median :13.50
##  Mean   :2017-09-06 07:23:04   Mean   :  8.932   Mean   :14.35
##  3rd Qu.:2018-12-31 00:00:00   3rd Qu.: 14.963   3rd Qu.:15.78
##  Max.   :2019-12-31 00:00:00   Max.   : 21.086   Max.   :22.70
##      bank              country               test          policy_change
##  Length:234         Length:234         Min.   :0.0000   Min.   :0.0000
##  Class :character   Class :character   1st Qu.:0.0000   1st Qu.:1.0000
##  Mode  :character   Mode  :character   Median :0.0000   Median :1.0000
##                                        Mean   :0.4872   Mean   :0.8205
##                                        3rd Qu.:1.0000   3rd Qu.:1.0000
##                                        Max.   :1.0000   Max.   :1.0000
##       did              gdp             cpi           exchange
##  Min.   :0.0000   Min.   :34961   Min.   : 97.75   DAX  : 40
##  1st Qu.:0.0000   1st Qu.:43551   1st Qu.:108.67   NKY  : 20
##  Median :0.0000   Median :44339   Median :110.96   SMI  : 20
##  Mean   :0.4103   Mean   :48323   Mean   :110.43   SPTSX:114
##  3rd Qu.:1.0000   3rd Qu.:45100   3rd Qu.:114.52   SPX  : 20
##  Max.   :1.0000   Max.   :87124   Max.   :119.62   UKX  : 20
##    stock_idx
##  Min.   :-19.269
##  1st Qu.: -1.635
##  Median :  8.206
##  Mean   :  9.435
##  3rd Qu.: 19.648
##  Max.   : 72.131
```

Check the ROE movement in each couuntry

Check ROE movement in the test and control groups

ROE Movement in the Test and Control Group

Estimating the DID estimator

```
didreg = lm(roe ~ test + policy_change + did, data = df_both)
summary(didreg)
```

```
##
## Call:
## lm(formula = roe ~ test + policy_change + did, data = df_both)
##
## Residuals:
##      Min      1Q   Median      3Q      Max
## -15.5660  -2.3315   0.6389   3.1429   7.5870
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     4.1254     0.8746   4.717 4.16e-06 ***
## test           11.9052     1.3360   8.911  < 2e-16 ***
## policy_change  -1.8623     0.9779  -1.904   0.0581 .
## did             1.3042     1.4722   0.886   0.3766
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
## 
## Residual standard error: 4.285 on 230 degrees of freedom
## Multiple R-squared:  0.6997, Adjusted R-squared:  0.6958
## F-statistic: 178.6 on 3 and 230 DF,  p-value: < 2.2e-16
```

The coefficient for 'did' is the differences-in-differences estimator. The effect is **not significant** at 10% with the treatment having no positive effect.