

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
##   <dtm>              <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
```

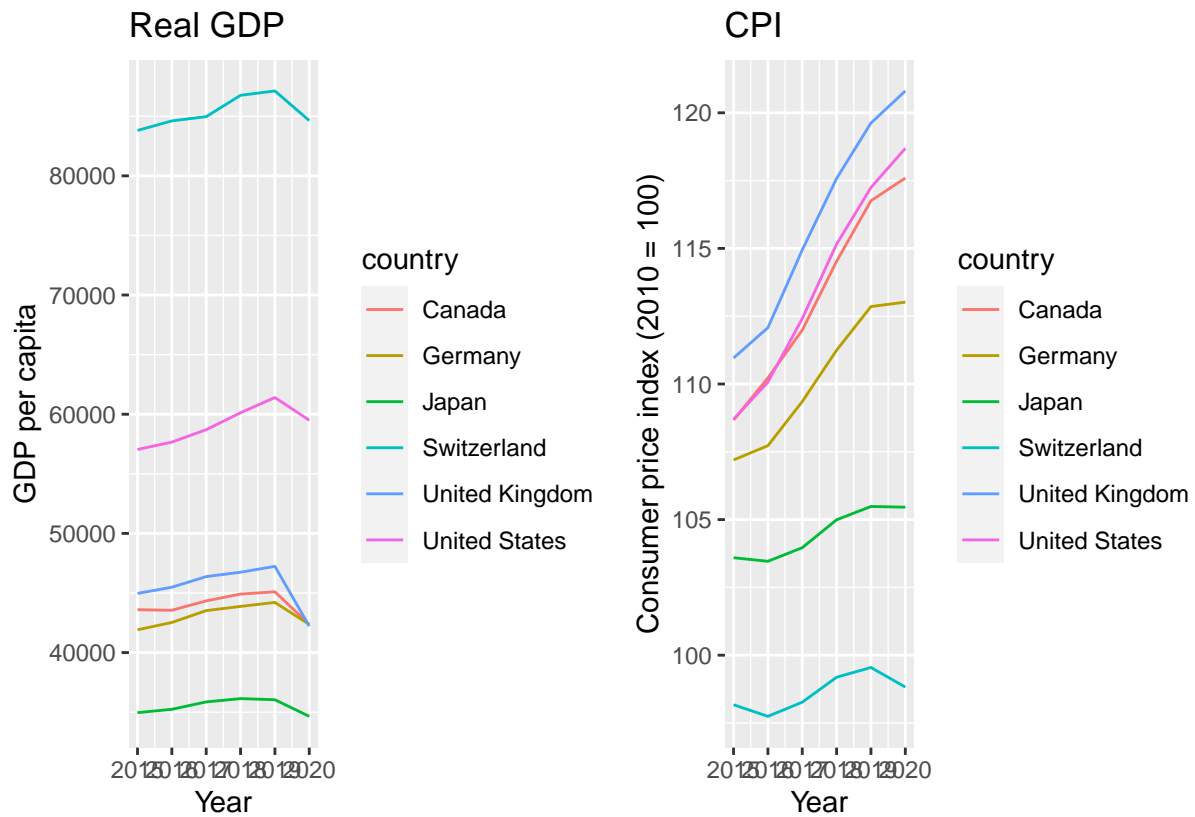
And the control set is as follow

```
## # A tibble: 3 x 6
##   date                roe  t1cr bank  country  test
##   <dtm>              <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 indices 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

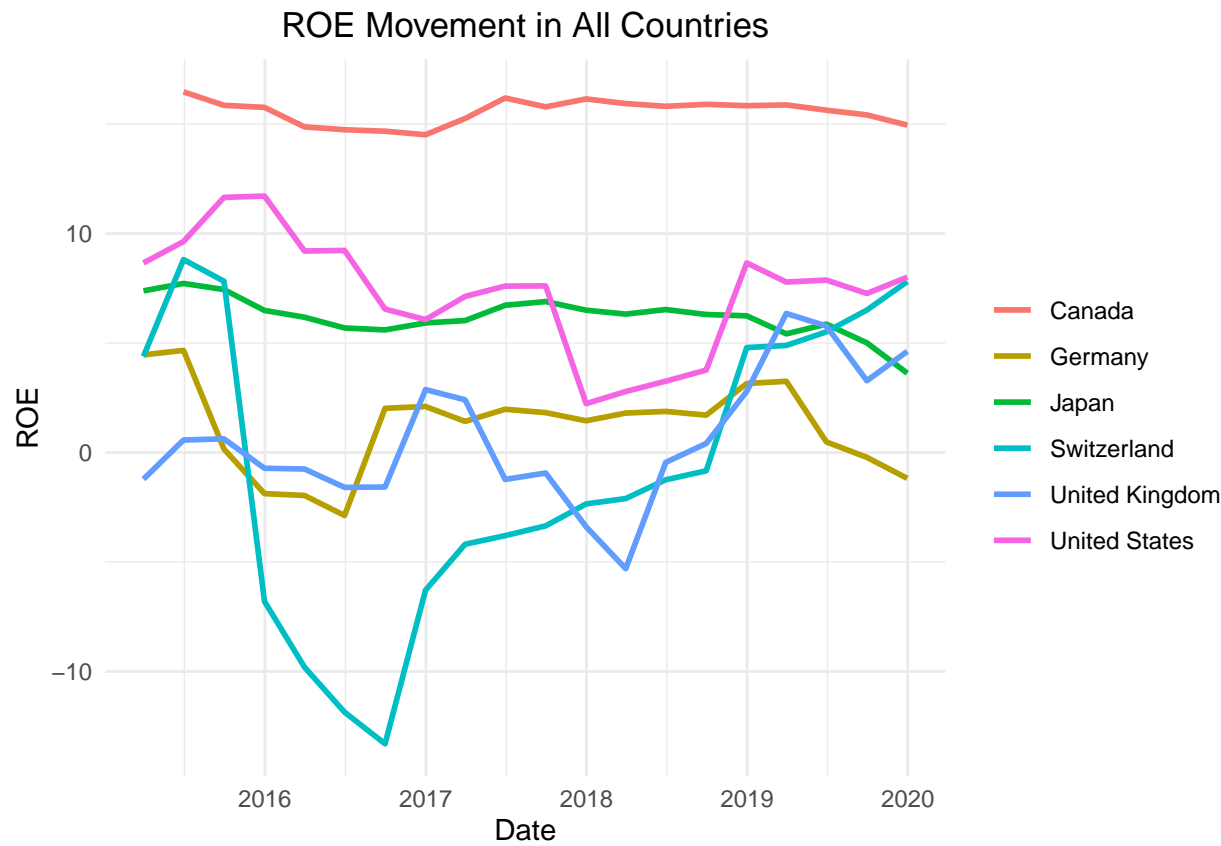
```
##      date      roe      t1cr
## Min.   :2015-03-31 00:00:00  Min.   : -13.303  Min.   :11.20
## 1st Qu.:2016-06-30 00:00:00  1st Qu.:  4.818  1st Qu.:12.57
```

```

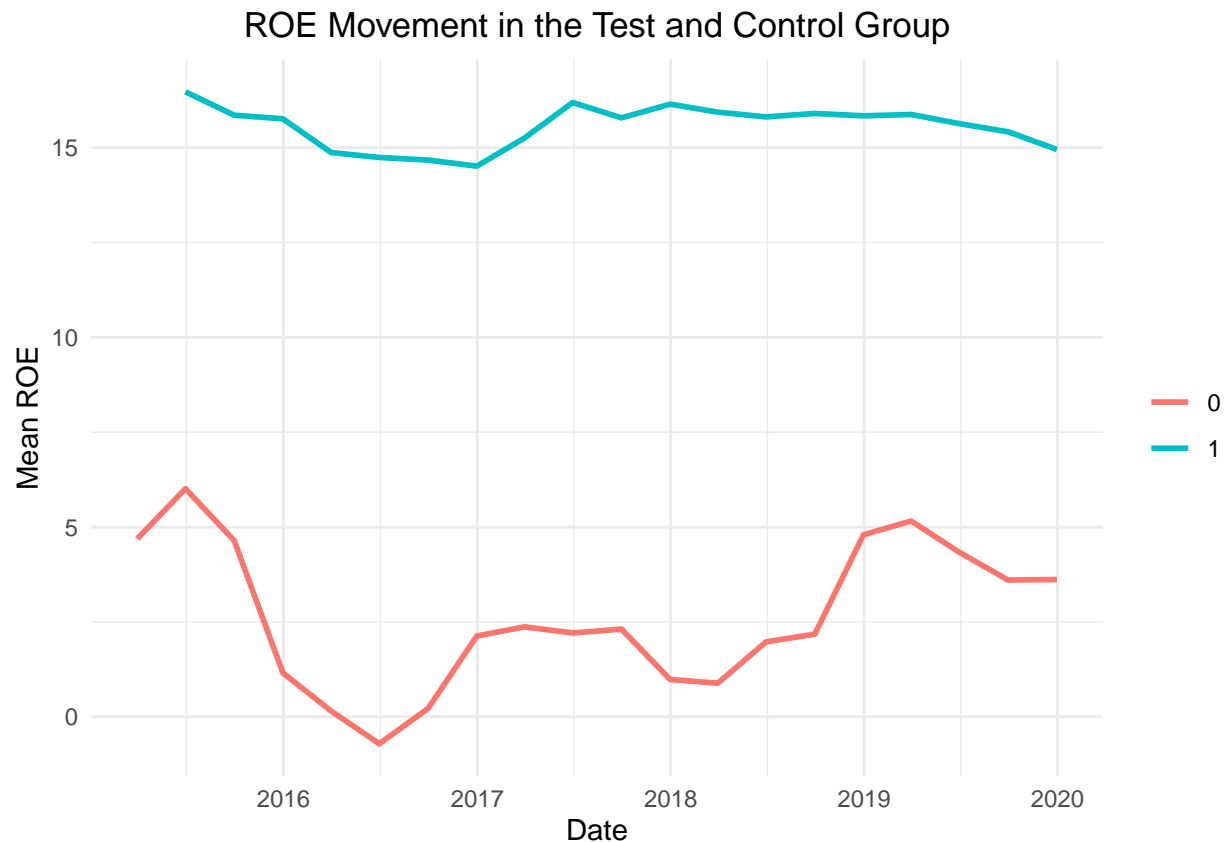
## Median :2017-09-30 00:00:00 Median : 9.434 Median :13.50
## Mean :2017-09-06 07:23:04 Mean : 8.932 Mean :14.35
## 3rd Qu.:2018-12-31 00:00:00 3rd Qu.: 14.963 3rd Qu.:15.78
## Max. :2019-12-31 00:00:00 Max. : 21.086 Max. :22.70
## bank country test policy_change
## Length:234 Length:234 Min. :0.0000 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 country



Check ROE movement in the test and control groups



Estimating the DID estimator

```
##
## 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.