Decompositions

Contents

Libraries

```
suppressPackageStartupMessages(library(readr))
suppressPackageStartupMessages(library(dplyr))
suppressPackageStartupMessages(library(stargazer))
suppressPackageStartupMessages(library(forecast))
suppressPackageStartupMessages(library(lubridate))
suppressPackageStartupMessages(library(stats))
suppressPackageStartupMessages(library(lfe))
suppressPackageStartupMessages(library(ggplot2))
suppressPackageStartupMessages(source("~/Documents/GitHub/MonetaryPolicyEffectOnNetInterestMargins/rmd_
```

Reading data

```
data <- read_csv("data/for_regressing/flattened.csv")
```

```
## Rows: 13268 Columns: 19
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr   (1): Bank
## dbl  (17): AE, LEV, CASH, NCI, NII, TA, SEC, LAS, OVDP, IR, IR_lag1, IR_lag2...
## date  (1): Date
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
functioning <- read_csv("data/for_regressing/banks_groups/functioning_or_not/functioning.csv", show_col
not_functioning <- read_csv("data/for_regressing/banks_groups/functioning_or_not/not_functioning.csv", s
top25 <- read_csv("data/for_regressing/banks_groups/top25_or_not/top25.csv", show_col_types = FALSE)  %>
```

```
## Warning: One or more parsing issues, call `problems()` on your data frame for details,
## e.g.:
##   dat <- vroom(...)
##   problems(dat)
```

```
rest <- read_csv("data/for_regressing/banks_groups/top25_or_not/rest.csv", show_col_types = FALSE)  %>%
gov <- read_csv("data/for_regressing/banks_groups/gov_or_private/gov.csv", show_col_types = FALSE)  %>%
private <- read_csv("data/for_regressing/banks_groups/gov_or_private/private.csv", show_col_types = FALS
top10 <- read_csv("data/for_regressing/banks_groups/top10_or_not/top10.csv", show_col_types = FALSE)  %>
rest10 <- read_csv("data/for_regressing/banks_groups/top10_or_not/rest.csv", show_col_types = FALSE)  %>
```

Generic model

```
data$Bank <- as.factor(data$Bank)
model <- felm(NII ~ AE + LEV + IR + NCI + TA + SEC | Bank | 0 | Bank, data = data)
generate_stargazer_with_titles(list(model), c('Generic FE model'))
```

```
##  Generic FE model
##
## ================================================
##                          Dependent variable:
##                      ---------------------------
##                                  NII
## ------------------------------------------------
## AE                          0.158* (0.088)
## LEV                          0.005 (0.004)
## IR                         0.0001** (0.00003)
## NCI                         -0.338* (0.192)
## TA                         -0.050*** (0.019)
## SEC                         0.005** (0.002)
## ------------------------------------------------
## Observations                    5,988
## R2                              0.350
## Adjusted R2                     0.327
## AIC                           -35494.41
## Residual Std. Error      0.012 (df = 5779)
```

```
## ================================================
## Note:                *p<0.1; **p<0.05; ***p<0.01
```

Pre-2014

Data

```
df_pre2014 <- data[data$Date < "2014-01-01", ]
functioning_pre2014 <- functioning[functioning$Date < "2014-01-01", ]
not_functioning_pre2014 <- not_functioning[not_functioning$Date < "2014-01-01", ]
```

General model for pre 2014 data

```
modelpre2014 <- felm(NII ~ AE + LEV + CASH + IR + NCI + TA + SEC | Bank | 0 | Bank, data = df_pre2014)

generate_stargazer_with_titles(list(model, modelpre2014), c('Generic FE model', 'Pre 2014'))
```

```
##  Generic FE model             Pre 2014
##
## ===========================================================
##                              Dependent variable:
##                     ------------------------------------
##                                       NII
##                              (1)                (2)
## -----------------------------------------------------------
## AE                       0.158* (0.088)     0.091 (0.056)
## LEV                      0.005 (0.004)     -0.009 (0.007)
## CASH                                      -0.015*** (0.003)
## IR                    0.0001** (0.00003) 0.00003 (0.00002)
## NCI                     -0.338* (0.192)    -0.127 (0.201)
## TA                     -0.050*** (0.019)   -0.084 (0.063)
## SEC                     0.005** (0.002)     0.004 (0.007)
## -----------------------------------------------------------
## Observations               5,988              2,497
## R2                         0.350              0.521
## Adjusted R2                0.327              0.482
## AIC                     -35494.41           -17016.24
## Residual Std. Error 0.012 (df = 5779)  0.008 (df = 2309)
## ===========================================================
## Note:                          *p<0.1; **p<0.05; ***p<0.01
```

Functioning banks vs closed ones

```
functioning_model_pre2014 <- felm(NII ~ AE + LEV + CASH + NCI + SEC + TA + IR |  Bank | 0 | Bank, data =
not_functioning_model_pre2014 <- felm(NII ~ AE + LEV + CASH + NCI + SEC + TA + IR |  Bank | 0 | Bank, da

generate_stargazer_with_titles(list(functioning_model_pre2014, not_functioning_model_pre2014, modelpre2
```

```
##  Functioning               Not functioning           Pre 2014
##
## ============================================================================
##                                        Dependent variable:
##                     ------------------------------------------------------
```

```
##                                          NII
##                            (1)               (2)              (3)
## ------------------------------------------------------------------------
## AE                       0.045 (0.043)     0.086 (0.065)    0.091 (0.056)
## LEV                    0.027*** (0.008)   -0.012* (0.006)  -0.009 (0.007)
## CASH                   -0.008** (0.003)  -0.015*** (0.005) -0.015*** (0.003)
## NCI                     0.782** (0.321)   -0.257 (0.217)   -0.127 (0.201)
## SEC                    -0.021*** (0.005)   0.010 (0.009)    0.004 (0.007)
## TA                      -0.020 (0.063)     0.002 (0.197)   -0.084 (0.063)
## IR                   0.0001*** (0.00003) 0.00001 (0.00003) 0.00003 (0.00002)
## ------------------------------------------------------------------------
## Observations                804              1,693            2,497
## R2                         0.625             0.528            0.521
## Adjusted R2                0.595             0.487            0.482
## AIC                      -6268.08          -11190.02        -17016.24
## Residual Std. Error  0.005 (df = 744)   0.009 (df = 1558) 0.008 (df = 2309)
## ========================================================================
## Note:                                        *p<0.1; **p<0.05; ***p<0.01
```

Post-2014

Data

```
df_after2014 <- data[data$Date >= "2014-01-01", ]
top25_after2014 <- top25[top25$Date >= "2014-01-01", ]
rest_after2014 <- rest[rest$Date >= "2014-01-01", ]

top10_after2014 <- top10[top10$Date >= "2014-01-01", ]
rest10_after2014 <- rest10[rest10$Date >= "2014-01-01", ]
```

General model for post 2014 data

```
model_after2014 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = df_after2014)

generate_stargazer_with_titles(list(model, model_after2014), c('Generic FE model', 'Post 2014'))
```

```
##  Generic FE model             Post 2014
##
## ============================================================
##                              Dependent variable:
##                     ---------------------------------------
##                                       NII
##                             (1)                (2)
## ------------------------------------------------------------
## AE                       0.158* (0.088)     0.179 (0.127)
## LEV                      0.005 (0.004)     0.009** (0.004)
## IR                    0.0001** (0.00003) 0.0002*** (0.0001)
## NCI                     -0.338* (0.192)     -0.386 (0.234)
## TA                     -0.050*** (0.019)  -0.111*** (0.040)
## SEC                     0.005** (0.002)    0.006** (0.003)
## ------------------------------------------------------------
## Observations               5,988              3,491
## R2                         0.350              0.390
```

```
## Adjusted R2               0.327              0.360
## AIC                    -35494.41           -19844.95
## Residual Std. Error 0.012 (df = 5779)  0.014 (df = 3326)
## ================================================================
## Note:                            *p<0.1; **p<0.05; ***p<0.01
```

Top 25 or not

```
top25_model_after2014 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = top25_afte
rest_model_after2014 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = rest_after

generate_stargazer_with_titles(list(top25_model_after2014, rest_model_after2014, model_after2014), c('To
```

```
##  Top 25                    Rest                     Post 2014
##
## ============================================================================
##                                      Dependent variable:
##                     ---------------------------------------------------
##                                            NII
##                           (1)               (2)               (3)
## ----------------------------------------------------------------------------
## AE                   0.584*** (0.164)    0.166 (0.132)      0.179 (0.127)
## LEV                    0.017 (0.012)    0.009** (0.004)    0.009** (0.004)
## NCI                  -0.327** (0.130)    -0.392 (0.247)     -0.386 (0.234)
## SEC                  0.010*** (0.003)    0.006* (0.003)     0.006** (0.003)
## TA                     0.003 (0.044)   -0.169*** (0.023)  -0.111*** (0.040)
## IR                   0.0001* (0.0001)  0.0003*** (0.0001) 0.0002*** (0.0001)
## ----------------------------------------------------------------------------
## Observations               1,048             2,443              3,491
## R2                         0.585             0.377              0.390
## Adjusted R2                0.573             0.339              0.360
## AIC                      -7618.66          -13159.75             -19844.95
## Residual Std. Error 0.006 (df = 1017) 0.016 (df = 2303)  0.014 (df = 3326)
## ============================================================================
## Note:                                          *p<0.1; **p<0.05; ***p<0.01
```

Top 10 or not

```
top10_model_after2014 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = top10_afte
rest10_model_after2014 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = rest10_a

generate_stargazer_with_titles(list(top10_model_after2014, rest10_model_after2014, model_after2014), c(
```

```
##  Top 10                    Rest                     Post 2014
##
## ============================================================================
##                                      Dependent variable:
##                     ---------------------------------------------------
##                                            NII
##                           (1)               (2)               (3)
## ----------------------------------------------------------------------------
## AE                   0.426** (0.168)    0.178 (0.128)      0.179 (0.127)
## LEV                  0.035*** (0.009)  0.009** (0.004)    0.009** (0.004)
## NCI                   -0.119 (0.150)    -0.391 (0.239)     -0.386 (0.234)
```

```
## SEC                 0.014** (0.005)    0.005* (0.003)    0.006** (0.003)
## TA                   -0.011 (0.038)  -0.166*** (0.022)  -0.111*** (0.040)
## IR                  0.0002* (0.0001) 0.0002*** (0.0001) 0.0002*** (0.0001)
## ------------------------------------------------------------------------
## Observations              428              3,063              3,491
## R2                       0.582             0.387              0.390
## Adjusted R2              0.567             0.355              0.360
## AIC                    -3307.78           -17054.32          -19844.95
## Residual Std. Error 0.005 (df = 412) 0.015 (df = 2908)  0.014 (df = 3326)
## ========================================================================
## Note:                                        *p<0.1; **p<0.05; ***p<0.01
```

Top 10 non gov

```
top10 <- read_csv("data/for_regressing/banks_groups/top10nongov_or_not/top10.csv", show_col_types = FALS
rest10 <- read_csv("data/for_regressing/banks_groups/top10nongov_or_not/rest.csv", show_col_types = FALS

top10_after2014 <- top10[top10$Date >= "2014-01-01", ]
rest10_after2014 <- rest10[rest10$Date >= "2014-01-01", ]

top10_model_after2014 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = top10_aft
rest10_model_after2014 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = rest10_a

generate_stargazer_with_titles(list(top10_model_after2014, rest10_model_after2014, model_after2014), c(
```

```
##  Top 10                  Rest                    Post 2014
##
## ========================================================================
##                                    Dependent variable:
##                     ---------------------------------------------------
##                                           NII
##                           (1)              (2)               (3)
## ------------------------------------------------------------------------
## AE                  0.551*** (0.108)   0.177 (0.129)      0.179 (0.127)
## LEV                 0.037** (0.014)   0.009** (0.004)    0.009** (0.004)
## NCI                  -0.116 (0.197)    -0.390 (0.239)     -0.386 (0.234)
## SEC                  0.005 (0.005)     0.005* (0.003)    0.006** (0.003)
## TA                   0.297 (0.219)   -0.120*** (0.035)  -0.111*** (0.040)
## IR                  0.0003* (0.0001) 0.0002*** (0.0001) 0.0002*** (0.0001)
## ------------------------------------------------------------------------
## Observations              428              3,063              3,491
## R2                       0.399             0.391              0.390
## Adjusted R2              0.377             0.359              0.360
## AIC                    -3298.26           -17053.37          -19844.95
## Residual Std. Error 0.005 (df = 412) 0.015 (df = 2908)  0.014 (df = 3326)
## ========================================================================
## Note:                                        *p<0.1; **p<0.05; ***p<0.01
```

Top 5 non gov

```
top10 <- read_csv("data/for_regressing/banks_groups/top5nongov_or_not/top5.csv", show_col_types = FALSE)
rest10 <- read_csv("data/for_regressing/banks_groups/top5nongov_or_not/rest.csv", show_col_types = FALS
```

```
top10_after2014 <- top10[top10$Date >= "2014-01-01", ]
rest10_after2014 <- rest10[rest10$Date >= "2014-01-01", ]

top10_model_after2014 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = top10_afte
rest10_model_after2014 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = rest10_a

generate_stargazer_with_titles(list(top10_model_after2014, rest10_model_after2014, model_after2014), c(
```

```
##  Top 10                   Rest                     Post 2014
##
## ================================================================================
##                                      Dependent variable:
##                      ---------------------------------------------------------
##                                             NII
##                            (1)               (2)                (3)
## --------------------------------------------------------------------------------
## AE                    0.795*** (0.153)   0.178 (0.128)      0.179 (0.127)
## LEV                    0.028 (0.018)    0.009** (0.004)    0.009** (0.004)
## NCI                    -0.231 (0.221)    -0.390 (0.239)     -0.386 (0.234)
## SEC                    0.003 (0.006)    0.006** (0.003)    0.006** (0.003)
## TA                     0.375 (0.235)   -0.122*** (0.035)  -0.111*** (0.040)
## IR                    0.0002 (0.0002)  0.0002*** (0.0001) 0.0002*** (0.0001)
## --------------------------------------------------------------------------------
## Observations               213              3,278              3,491
## R2                        0.334             0.392              0.390
## Adjusted R2               0.301             0.361              0.360
## AIC                     -1608.69           -18461.23          -19844.95
## Residual Std. Error 0.005 (df = 202) 0.014 (df = 3118)  0.014 (df = 3326)
## ================================================================================
## Note:                                          *p<0.1; **p<0.05; ***p<0.01
```

2017 to 2023 (2nd quart)

Data

```
df_after2017 <- data[data$Date >= "2017-01-01", ]
df_after2017pre2023 <- df_after2017[df_after2017$Date < "2023-07-01", ]
gov_after2017 <- gov[gov$Date >= "2017-01-01", ]
private_after2017 <- private[private$Date >= "2017-01-01", ]
gov_after2017pre2023 <- gov_after2017[gov_after2017$Date < "2023-07-01", ]
private_after2017pre2023 <- private_after2017[private_after2017$Date < "2023-07-01", ]
```

General model

```
model_after2017pre2023 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = df_after

generate_stargazer_with_titles(list(model, model_after2017pre2023), c('Generic FE model', 'Post 2017, P
```

```
##  Generic FE model             Post 2017, Pre 2023
##
## ===========================================================
##                                Dependent variable:
##                      -------------------------------------
```

```
##                                      NII
##                            (1)                (2)
## ------------------------------------------------------------
## AE                      0.158* (0.088)     0.205 (0.149)
## LEV                     0.005 (0.004)     0.021*** (0.006)
## IR                   0.0001** (0.00003) 0.0002*** (0.0001)
## NCI                    -0.338* (0.192)    -0.517* (0.271)
## TA                    -0.050*** (0.019)    0.034 (0.039)
## SEC                    0.005** (0.002)     0.001 (0.003)
## ------------------------------------------------------------
## Observations               5,988              1,936
## R2                         0.350              0.653
## Adjusted R2                0.327              0.634
## AIC                     -35494.41           -12718.62
## Residual Std. Error 0.012 (df = 5779)  0.009 (df = 1836)
## ============================================================
## Note:                           *p<0.1; **p<0.05; ***p<0.01
```

Gov. owned vs private banks

```
# View(gov_after2017pre2023)
# View(private_after2017pre2023)
# View(private_after2017pre2023)

gov_model_after2017pre2023 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = gov_a
private_model_after2017pre2023 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = p
model_model_after2017pre2023 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = pri

generate_stargazer_with_titles(list(gov_model_after2017pre2023, private_model_after2017pre2023, model_a
```

```
##  Gov                       Private                  General
##
## ============================================================================
##                                    Dependent variable:
##                      ---------------------------------------------------
##                                           NII
##                            (1)               (2)                (3)
## ----------------------------------------------------------------------------
## AE                     0.168 (0.258)     0.216 (0.147)      0.205 (0.149)
## LEV                   0.075*** (0.012)  0.021*** (0.006)   0.021*** (0.006)
## NCI                    -0.248 (0.359)   -0.523* (0.274)    -0.517* (0.271)
## SEC                    -0.004 (0.009)    0.001 (0.003)      0.001 (0.003)
## TA                    -0.066* (0.024)   0.089*** (0.017)    0.034 (0.039)
## IR                    0.0001 (0.0001)  0.0002*** (0.0001) 0.0002*** (0.0001)
## ----------------------------------------------------------------------------
## Observations               104              1,832              1,936
## R2                        0.470             0.642              0.653
## Adjusted R2               0.420             0.623              0.634
## AIC                     -883.92           -11939.18             -12718.62
## Residual Std. Error 0.003 (df = 94)  0.009 (df = 1736)  0.009 (df = 1836)
## ============================================================================
## Note:                                          *p<0.1; **p<0.05; ***p<0.01
```

Pre 2014 to Post 2014 compared

```
generate_stargazer_with_titles(list(modelpre2014, model_after2014), c('Pre 2014', 'Post 2014'))
```

```
##  Pre 2014                    Post 2014
##
## ========================================================
##                              Dependent variable:
##                     ------------------------------------
##                                      NII
##                             (1)               (2)
## --------------------------------------------------------
## AE                      0.091 (0.056)     0.179 (0.127)
## LEV                    -0.009 (0.007)    0.009** (0.004)
## CASH                  -0.015*** (0.003)
## IR                   0.00003 (0.00002) 0.0002*** (0.0001)
## NCI                    -0.127 (0.201)     -0.386 (0.234)
## TA                     -0.084 (0.063)   -0.111*** (0.040)
## SEC                     0.004 (0.007)    0.006** (0.003)
## --------------------------------------------------------
## Observations              2,497             3,491
## R2                        0.521             0.390
## Adjusted R2               0.482             0.360
## AIC                     -17016.24          -19844.95
## Residual Std. Error 0.008 (df = 2309) 0.014 (df = 3326)
## ========================================================
## Note:                         *p<0.1; **p<0.05; ***p<0.01
```

Post 2022

```
df_after2022 <- data[data$Date >= "2022-01-01", ]
df_pre2022 <- data[data$Date < "2022-01-01", ]
df_after2014pre2022 <- df_after2014[df_after2014$Date < "2022-01-01", ]
model_after2022 <- felm(NII ~ AE + LEV + CASH + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = df_after
model_after2014pre2022 <- felm(NII ~ AE + LEV + NCI + SEC + TA + IR |  Bank | 0 | Bank, data = df_after
generate_stargazer_with_titles(list(model_after2014pre2022, model_after2022), c('2014-2022', 'Post 2022
```

```
##  2014-2022                   Post 2022
##
## ========================================================
##                              Dependent variable:
##                     ------------------------------------
##                                      NII
##                             (1)               (2)
## --------------------------------------------------------
## AE                      0.152 (0.113)    0.390** (0.181)
## LEV                     0.007* (0.004)    0.012 (0.013)
## CASH                                      0.003 (0.016)
## NCI                    -0.462* (0.265)    -0.087 (0.060)
## SEC                    0.006** (0.003)    0.008* (0.004)
## TA                     -0.154** (0.068)   0.143* (0.079)
## IR                   0.0002*** (0.0001) 0.0001 (0.0001)
## --------------------------------------------------------
```

```
## Observations              2,760              731
## R2                        0.359             0.836
## Adjusted R2               0.319             0.816
## AIC                    -15351.42          -5196.73
## Residual Std. Error 0.015 (df = 2596)  0.007 (df = 652)
## ========================================================
## Note:                        *p<0.1; **p<0.05; ***p<0.01
```