Code_Quantile Regression

December 14, 2020

[8]:
```
#### Table 4.2 ------------------------------------------------------------------
library(quantreg)  # for quantile regression
library(rqpd)          # for quantile fixed effects regression
library(lfe)

setwd("/Users/nicoleyin88/Documents/1. Panel Data/0. Final Project/1. Code/")
data1 <- read.csv("5yr_panel.csv", header=TRUE)
democ1 <- data.frame(data1)
Democracy <- democ1$polity4
Income <- democ1$lrgdpch
```

[14]:
```
#### Model 1. Pooled OLS
# (1 ) without Region and Year Effects
taus <- c(0.1, 0.25, 0.5, 0.75, 0.9)
model1 <- rq(Democracy ~ lag(Income) + lag(lpop), taus, democ1)
coef(model1)[2:3,]

model1_mu <- lm(Democracy ~ lag(Income) + lag(lpop), democ1)
coef(model1_mu)[2:3]
```

	tau= 0.10	tau= 0.25	tau= 0.50	tau= 0.75	tau= 0.90
lag(Income)	0.06245170	0.292213687	0.27266847	0.144548790	0.057501898
lag(lpop)	0.01193844	0.007390393	-0.01248087	-0.006686497	-0.004946255

lag(Income) 0.222669057791851 **lag(lpop)** 0.00271948581753854

[15]:
```
# (2) with Region Effects
model2 <- rq(Democracy ~ lag(Income) + lag(lpop) + as.factor(country), taus,␣
 ↪democ1)
coef(model2)[2:3,]

model2_mu <- lm(Democracy ~ lag(Income) + lag(lpop) + as.factor(country), democ1)
coef(model2_mu)[2:3]
```

```
Warning message in rq.fit.br(x, y, tau = tau, ...):
"Solution may be nonunique"Warning message in rq.fit.br(x, y, tau = tau, ...):
"Solution may be nonunique"Warning message in rq.fit.br(x, y, tau = tau, ...):
"Solution may be nonunique"
```

	tau= 0.10	tau= 0.25	tau= 0.50	tau= 0.75	tau= 0.90
lag(Income)	6.141643e-16	-4.313045e-17	-0.02452689	-0.04005437	-0.04864393
lag(lpop)	1.367162e-15	1.173096e-15	0.15504806	0.21146077	0.20834647

lag(Income) 0.00568659221777254 **lag(lpop)** 0.262019361434249

[16]:
```
# (3) with Region and Year Effects
model3 <- rq(Democracy ~ lag(Income) + lag(lpop) + as.factor(country) + as.
 ↪factor(year), taus, democ1)
coef(model3)[2:3,]

model3_mu <- lm(Democracy ~ lag(Income) + lag(lpop) + as.factor(country) + as.
 ↪factor(year), democ1)
coef(model3_mu)[2:3]
```

```
Warning message in rq.fit.br(x, y, tau = tau, ...):
"Solution may be nonunique"Warning message in rq.fit.br(x, y, tau = tau, ...):
"Solution may be nonunique"Warning message in rq.fit.br(x, y, tau = tau, ...):
"Solution may be nonunique"
```

	tau= 0.10	tau= 0.25	tau= 0.50	tau= 0.75	tau= 0.90
lag(Income)	4.893003e-17	-5.235224e-16	-0.02065839	-0.04062680	-0.10851120
lag(lpop)	3.024389e-15	2.934317e-15	0.08611547	0.05390281	0.02438486

lag(Income) -0.0538574568214363 **lag(lpop)** -0.0112451943980086

[32]:
```
# Model 3. Fixed Effects
# (8) with Region Effects
fe2 <- rqpd(Democracy ~ lag(Income) + lag(lpop) | as.factor(country),
            panel(method="pfe", tau=c(0.1, 0.25, 0.5, 0.75, 0.9),
                  tauw=rep(1/5, 5)), data=democ1)
fe2.coef <- c(fe2$coef[2], fe2$coef[5], fe2$coef[8], fe2$coef[11],␣
 ↪fe2$coef[14],fe2$coef[17])
fe2.coef

fe2_mu <- felm(Democracy ~ lag(Income) + lag(lpop) + as.factor(country),␣
 ↪data=democ1)
coef(fe2_mu)[2:3]
```

lag(Income){[}0.1{]} 0.229876709612809 **lag(Income){[}0.25{]}** 0.25164983652617
lag(Income){[}0.5{]} 0.237968922273101 **lag(Income){[}0.75{]}** 0.159712754390417
lag(Income){[}0.9{]} 0.0690702513050876 **as.factor(country)Albania** 0.0330859760820137

```
Error in felm(Democracy ~ lag(Income) + lag(lpop) + as.factor(country), : "felm"
Traceback:
```

[31]:
```
# (9) with Year Effects
fe3 <- rqpd(Democracy ~ lag(Income) + lag(lpop) | as.factor(year),
            panel(method="pfe", taus=c(0.1, 0.25, 0.5, 0.75, 0.9,1.0),
                  tauw=rep(1/6, 6)), data=democ1)
fe3.coef <- c(fe3$coef[2], fe3$coef[5], fe3$coef[8],␣
 ↪fe3$coef[11],fe3$coef[14],fe3$coef[17])
fe3.coef

fe3_mu <- felm(Democracy ~ lag(Income) + lag(lpop) + as.factor(country) +as.
 ↪factor(year) , data=democ1)
coef(fe3_mu)[2:3]
```

lag(Income){[}0.1{]} 0.068569259454132 **lag(Income){[}0.25{]}** 0.267500711851843
lag(Income){[}0.5{]} 0.268898971165484 **lag(Income){[}0.75{]}** 0.161028247433983
lag(Income){[}0.9{]} 0.0797664834685899 **lag(Income){[}0.999999999963331{]}** 0.15812565780694

```
Error in felm(Democracy ~ lag(Income) + lag(lpop) + as.factor(country) + : "felm'
Traceback:
```