

Quantile Analysis

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Load in packages.

```
library(tidyverse)
library(dplyr)
library(readr)
library(readxl)
library(naniar)
library("readr")
library("microsynth")
library("LowRankQP")
#install.packages("quantreg")
library(quantreg)

setwd('/Users/michelle/Documents/UKR-airports')
data <- read_csv("data/SCM_data.csv")
```

Log several variables.

```
data2 <- data %>%
  select(Country.Name, year, Foreign.direct.investment.net.inflows.pct.of.GDP, fatalities.y.Battles, fa

data2$ln_pass <- log1p(data2$total.passengers.in)
data2$ln_battle_fatalities <- log1p(data2$fatalities.y.Battles)
data2$ln_civilian_violence_fatalities <- log1p(data2$fatalities.y.Violence.against.civilians)
data2$ln_events <- log1p(data2$count.events.y.All.types.of.violent.conflict)

#data2$ln_pass <- replace(data2$ln_pass, is.infinite(data2$ln_pass) & data2$ln_pass < 0, 0)
#data2$ln_battle_fatalities <- replace(data2$ln_battle_fatalities, is.infinite(data2$ln_battle_fataliti
#data2$ln_civilian_violence_fatalities <- replace(data2$ln_civilian_violence_fatalities, is.infinite(da
#data2$ln_events <- replace(data2$ln_events, is.infinite(data2$ln_events) & data2$ln_events < 0, 0)
```

Basic quantile model: FDI on ln(passengers_in_total)

```
qr.model <- rq(Foreign.direct.investment.net.inflows.pct.of.GDP ~ ln_pass,
  data = data2, tau = c(0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8,0.9,1))

qr.model[["coefficients"]]
```

```
##                tau= 0.1   tau= 0.2   tau= 0.3   tau= 0.4   tau= 0.5
## (Intercept)  0.33151929 0.94025522 1.46871307 2.101721082 2.688581824
```

```
## ln_pass      -0.01314977 0.01283855 0.01519595 0.008296265 0.009710437
##              tau= 0.6    tau= 0.7    tau= 0.8    tau= 0.9    tau= 1.0
## (Intercept)  3.480699573  4.52412383  6.828451  11.995558 280.14551
## ln_pass      0.002297376 -0.01954095 -0.104196 -0.259189 -14.19781
```

(1): Running the quantile regression with ACLED numbers as a control. From the documentation: “The WEIGHT statement specifies a weight variable in the input data set. To request weighted quantile regression, place the weights in a variable. The values of the WEIGHT variable can be nonintegral and are not truncated. Observations with nonpositive or missing values for the weight variable do not contribute to the fit of the model.” <https://support.sas.com/documentation/onlinedoc/stat/142/qreg.pdf>

Weighing by battle fatalities:

```
qr.model <- rq(Foreign.direct.investment.net.inflows.pct.of.GDP ~ ln_pass,
               data = data2, tau = c(0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8,0.9,1),
               weight = ln_battle_fatalities)

qr.model[["coefficients"]]

##              tau= 0.1    tau= 0.2    tau= 0.3    tau= 0.4    tau= 0.5    tau= 0.6
## (Intercept)  0.14440106 0.48737247 1.00393639 1.34333861 1.68919943 2.14019963
## ln_pass      0.03965494 0.05024135 0.03805129 0.05386086 0.05606217 0.05178861
##              tau= 0.7    tau= 0.8    tau= 0.9    tau= 1.0
## (Intercept)  2.59030845 3.1975675  4.971522454 38.942865
## ln_pass      0.05473321 0.0597402 -0.004906635 8.613608
```

#By using battle fatalities as weights, this shows the effects of passengers on FDI where battle numbers are higher

Weighing by civilian violence fatalities:

```
qr.model <- rq(Foreign.direct.investment.net.inflows.pct.of.GDP ~ ln_pass,
               data = data2, tau = c(0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8,0.9,1),
               weight = ln_civilian_violence_fatalities)

qr.model[["coefficients"]]

##              tau= 0.1    tau= 0.2    tau= 0.3    tau= 0.4    tau= 0.5    tau= 0.6
## (Intercept)  0.12449599 0.39759005 0.98316619 1.3359173 1.66129507 2.11999261
## ln_pass      0.04550236 0.06398363 0.04377282 0.0580259 0.06441087 0.05397141
##              tau= 0.7    tau= 0.8    tau= 0.9    tau= 1.0
## (Intercept)  2.60581166 3.41047904 5.41557013 237.35551
## ln_pass      0.05790719 0.04738953 -0.03453349 -14.06653
```

#By using civilian violence fatalities as weights, this shows the effects of passengers on FDI where civilian violence numbers are higher

Weighing by number of violent events, all types of violent conflict:

```
qr.model <- rq(Foreign.direct.investment.net.inflows.pct.of.GDP ~ ln_pass,
               data = data2, tau = c(0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8,0.9,1),
               weight = ln_events)

qr.model[["coefficients"]]
```

```
##          tau= 0.1   tau= 0.2   tau= 0.3   tau= 0.4   tau= 0.5   tau= 0.6
## (Intercept) 0.14440106 0.55978363 1.06894190 1.46272973 1.98912793 2.53049662
## ln_pass     0.02391971 0.03938693 0.03323556 0.04577842 0.04323158 0.04320444
##          tau= 0.7   tau= 0.8   tau= 0.9   tau= 1.0
## (Intercept) 3.28518934 4.471176846 7.9132347 237.35551
## ln_pass     0.02782911 -0.002677161 -0.1870566 -14.06653
```

*#By using number of violent events as weights, this shows the effects of the
#number of violent events (theoretically those picked up by news outlets in
#order to be included in ACLED data) on FDI where civilian violence numbers are
#higher. Maybe this shows the impact of total perceived/reported amount of violence.*

(2) Running with lags on the PASSENGER data

(3)

- 100 violent deaths
- run the same regression

(3) total passengers in, and spike, and pct, and regress on FDI (Quantile)

(4) Get GDP numbers from Ukraine IMF report Convert using exchange rates Put into dataset in SCM.Rmd Multiply with FDI % to get total FDI column Export new dataset Rerun 1,2,3 with total FDI