

working paper

DB

June 17, 2016

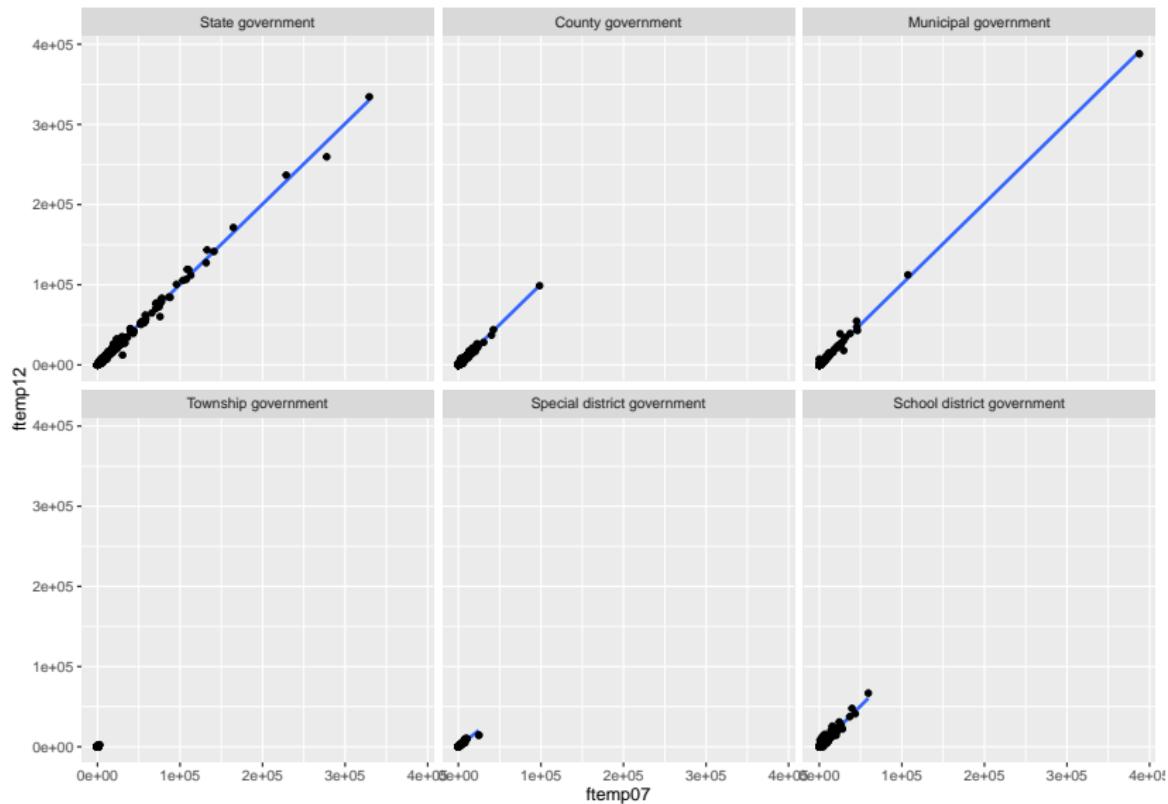
Pre-requisite

Execute :

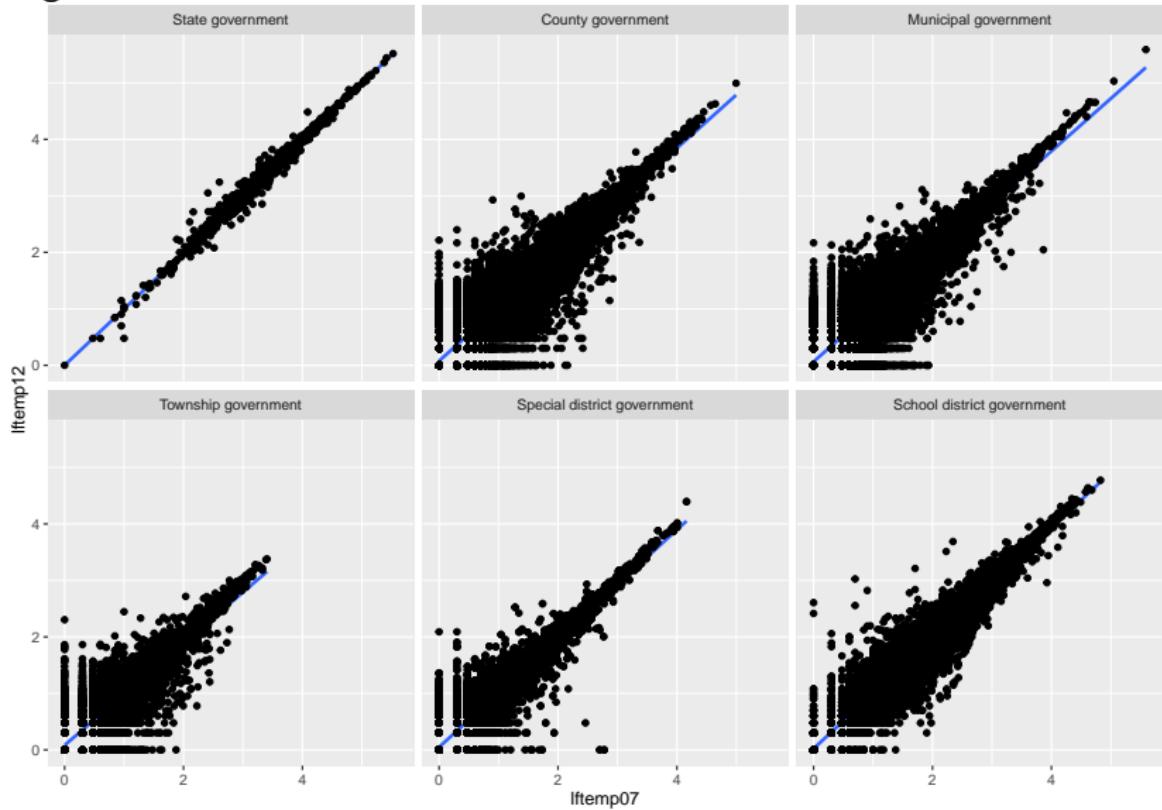
```
devtools::install_github(  
  "DanielBonnery/pubBonneryLahiriTran2016")  
library(pubBonneryLahiriTran2016)
```

Descriptive statistics and graphs

demo(descriptive)



log scale:



Simple model

$$\begin{aligned}\ln(\text{ftemp}_{2012,k}) \\ = & \beta_{0,\text{state}_k,\text{code}_k,\text{type}_k} \\ & + \beta_{1,\text{state}_k,\text{code}_k,\text{type}_k} \times \ln(\text{ftemp}_{2007,k}) + \varepsilon_k\end{aligned}$$

with all fixed parameters, normal prior on all the β . inverse gamma prior on variance parameter.

The model used in jags is:

```
"model {  
    for (i in 1:N) {  
        lftemp12[i] ~  
            dnorm(beta0[state[i],itemcode[i],type_of_gov[i]] +  
                  beta1[state[i],itemcode[i],type_of_gov[i]] *  
                  lftemp07[i],tau)}  
    for (i1 in 1:dime[1]) {  
        for (i2 in 1:dime[2]) {  
            for (i3 in 1:dime[3]) {  
                beta0[i1,i2,i3] ~ dnorm (0 ,1.0E-4);  
                beta1[i1,i2,i3] ~ dnorm (1 ,1.0E-4);}}}  
    tau~ dgamma (1.0E-4 ,1.0E-4);  
    sigma <- 1/tau  
}"
```

To execute:

```
library(pubBonneryLahiriTran2016)
demo(mcmc1)
```

Model discussed

$$\begin{aligned}\ln(\text{ftemp}_{2012,k}) \\ = & \beta_{0,\text{state}_k,\text{code}_k,\text{type}_k} \\ & + \beta_{1,\text{state}_k,\text{code}_k,\text{type}_k} \times \ln(\text{ftemp}_{2007,k}) + \varepsilon_k\end{aligned}$$

With β mixed effects. $\beta_{i,\text{state}_k,\text{code}_k,\text{type}_k} = \gamma_{i,\text{state}_k,\text{code}_k,\text{type}_k}$

R code