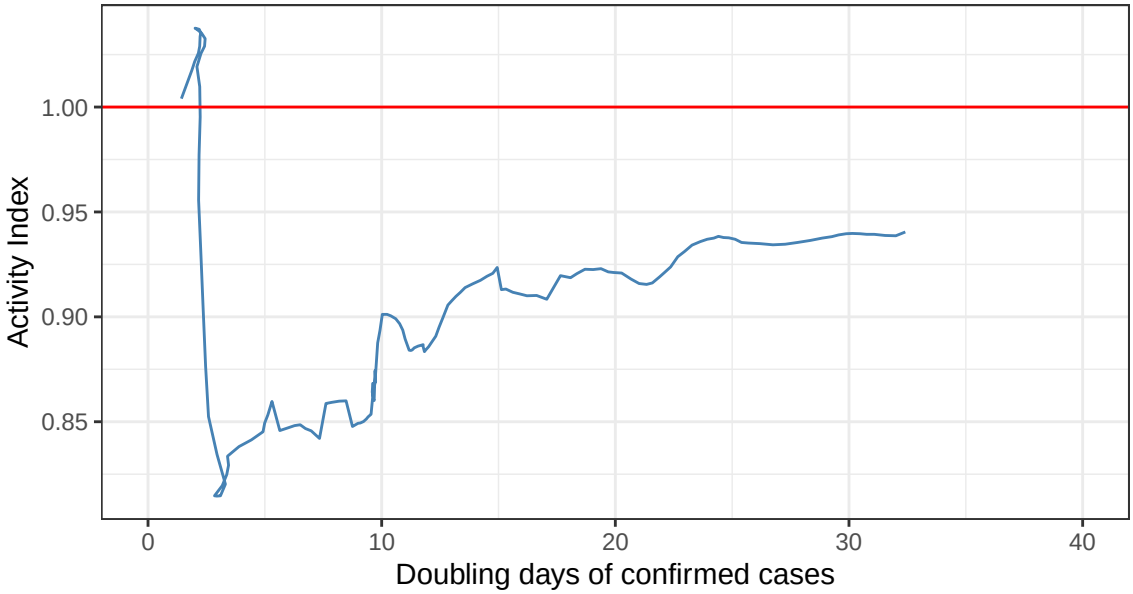
Atividade x COVID

Brasil



Usando dados de mobilidade e energia

Utilizamos os dados de mobilidade do Google para montar o índice de atividade, de forma que:

$$\text{Atividade} = 0.3886 \cdot \text{Mobilidade} + 0.61$$

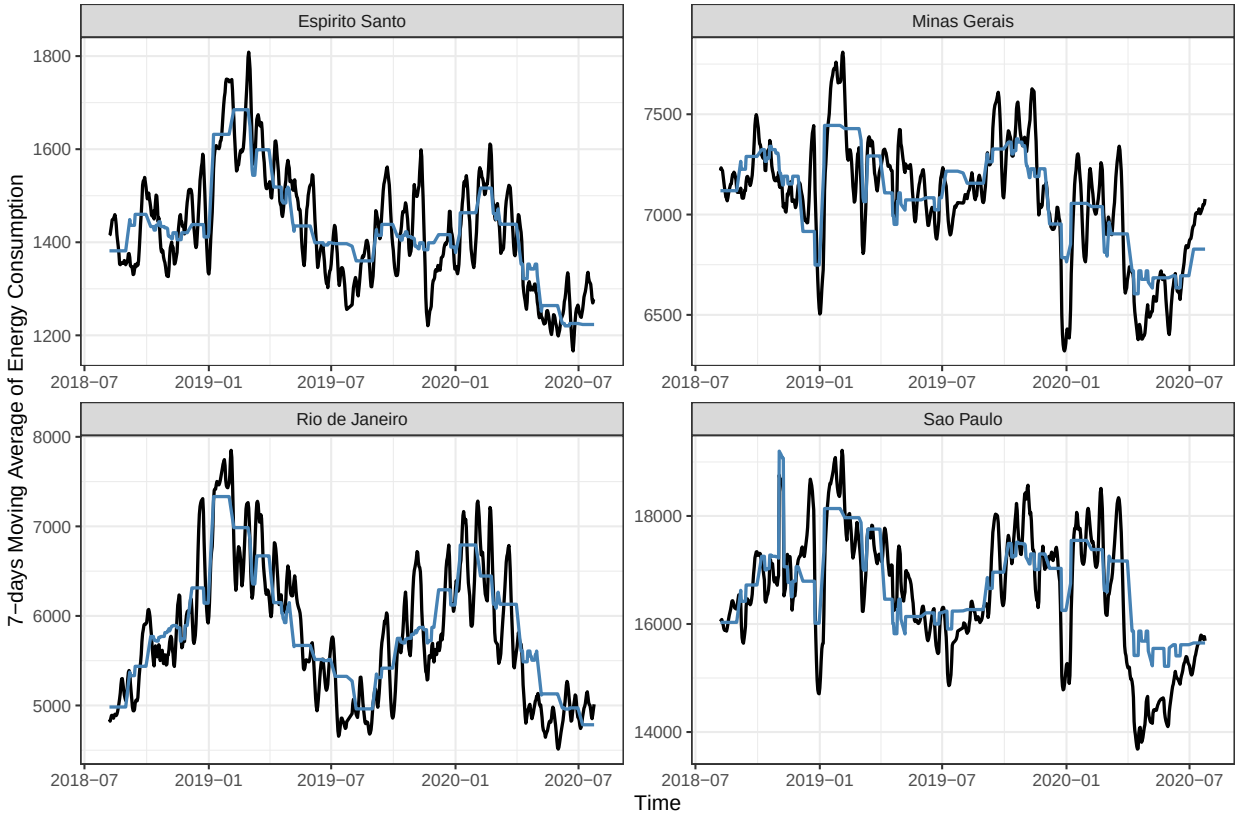
Para definir o contrafactual nos dados de energia, fazemos uma regressão para cada estado, com os dados de 08/2018 até 02/2020, da seguinte forma:

$$\begin{aligned}\text{Consumo Diario}_t = \beta_0 + \sum_{i=2}^{3} \psi_i D_{\text{ano}_{it}} + \sum_{i=2}^{12} \delta_i D_{\text{mês}_{it}} + \sum_{i=2}^{7} \lambda_i D_{\text{dia da semana}_{it}} + \\ + \sum_{i=2}^{k} \rho_i D_{\text{ramo}_{it}} + \sum_{i=2}^{k} \theta_i D_{\text{feriado}_{it}} + \epsilon_t\end{aligned} \tag{1}$$

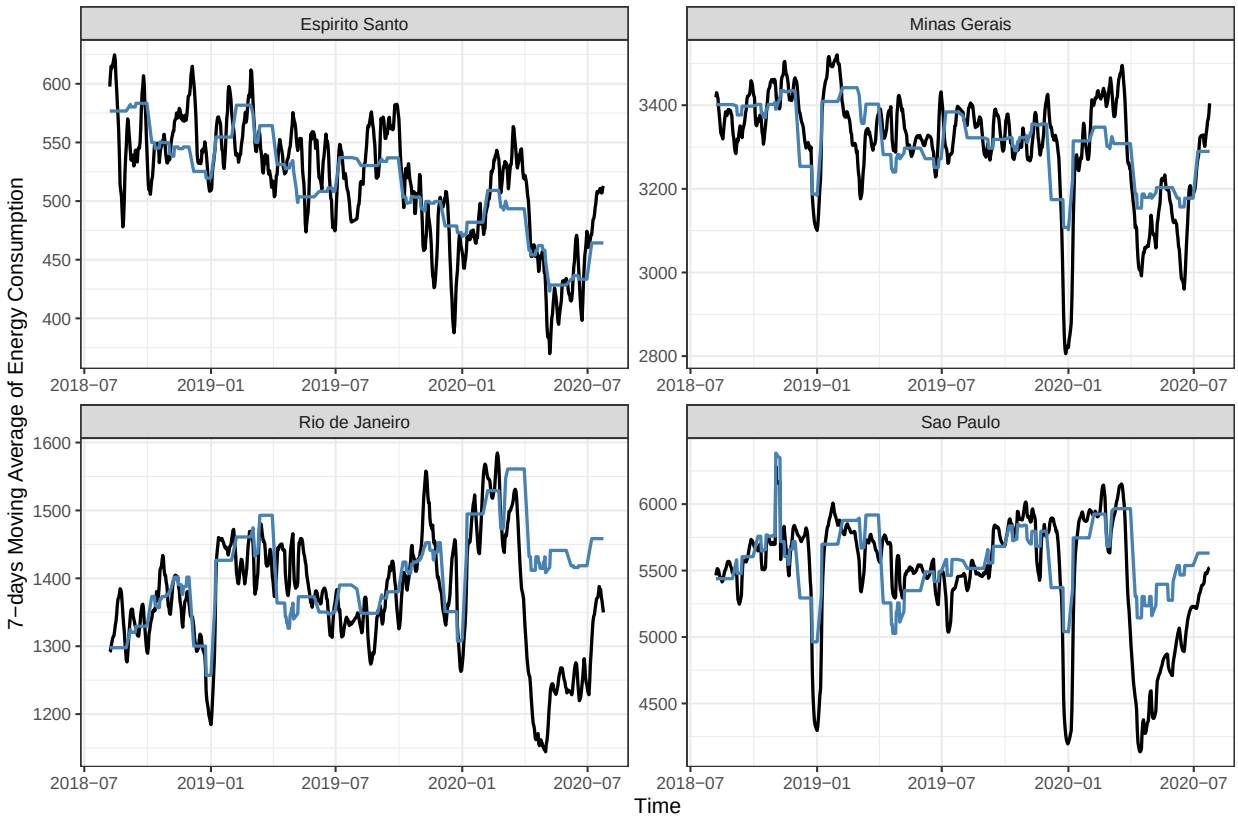
A partir de 1, usamos os valores preditos para os dados a partir de Março de 2020 como o esperado para o consumo de energia. A diferença percentual mostrada nos gráficos abaixo se baseia nesses valores.

Testando o fit nos dados de energia

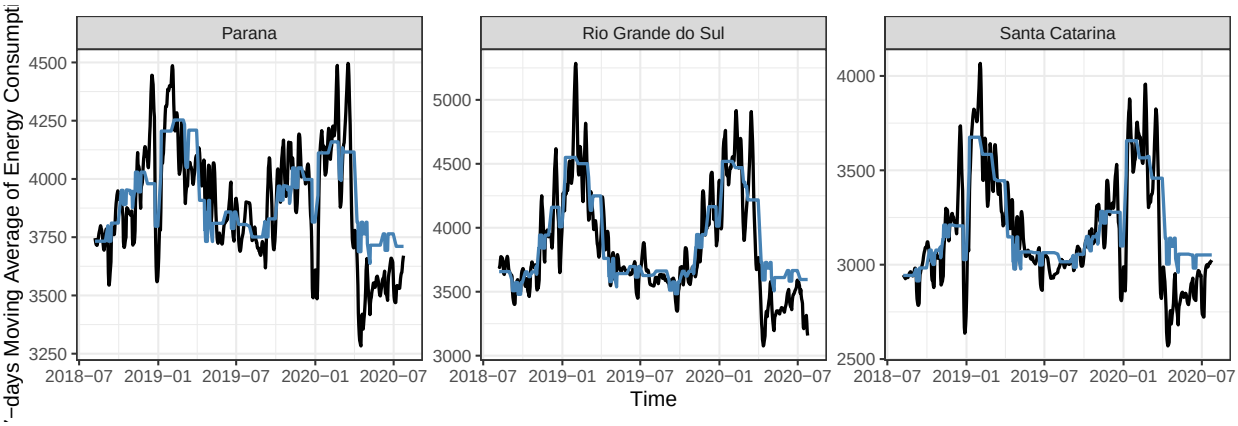
Região Sudeste



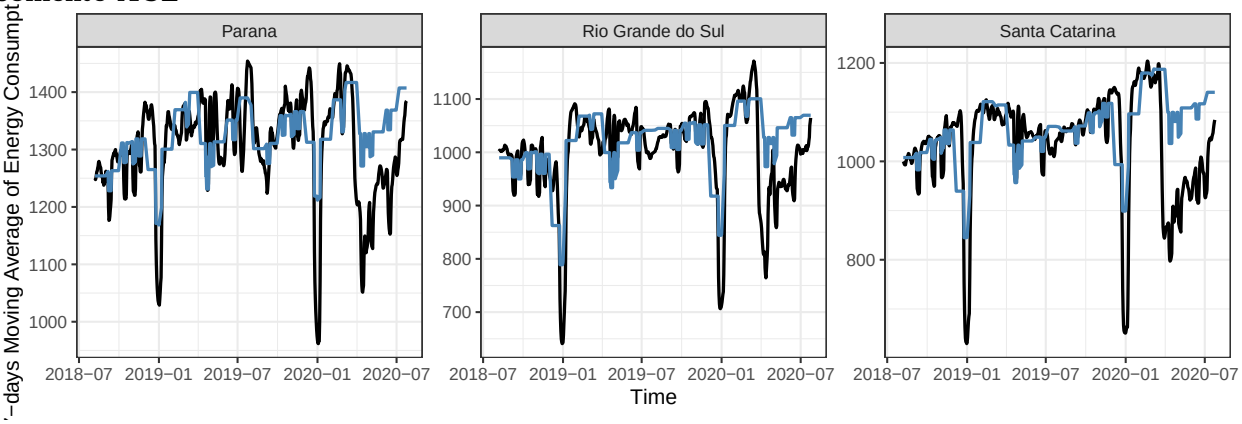
Somente ACL


Espirito Santo
Minas Gerais
Rio de Janeiro
Sao Paulo
7−days Moving Average of Energy Consumption
Time
2018−07
2019−01
2019−07
2020−01
2020−07

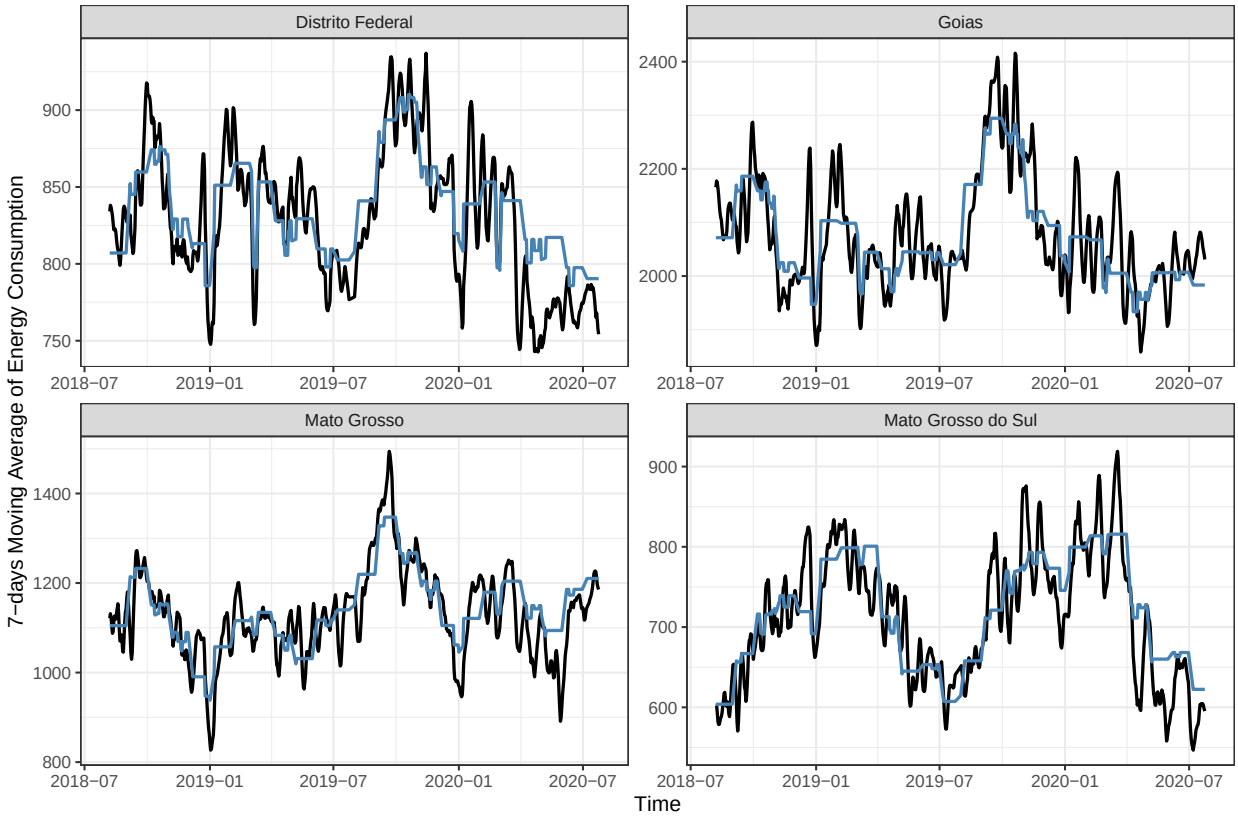
Região Sul


Parana
Rio Grande do Sul
Santa Catarina
4500
4250
4000
3750
3500
3250
5000
4500
4000
3500
3000
4000
3500
3000
2500
2018−07
2019−01
2019−07
2020−01
2020−07
Time

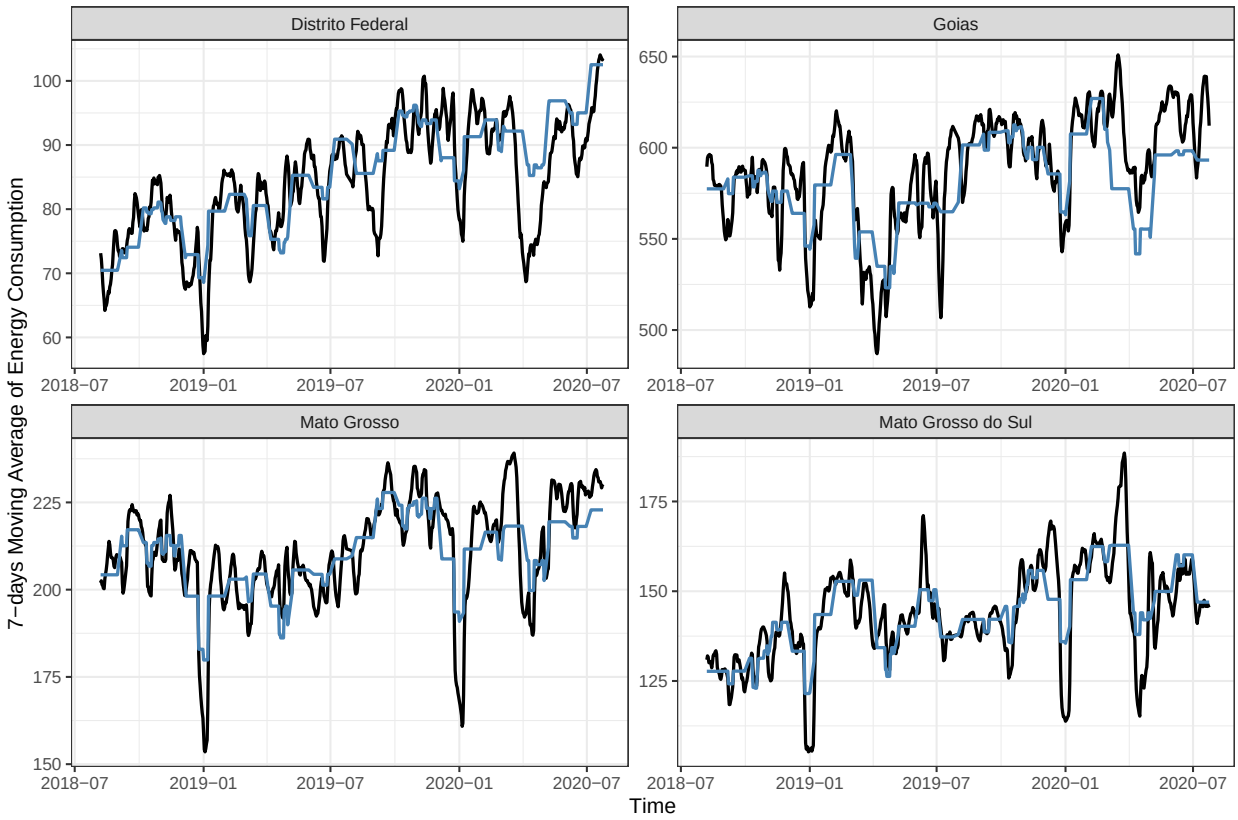
Somente ACL


Parana
Rio Grande do Sul
Santa Catarina
1400
1300
1200
1100
1000
1100
1000
900
800
700
1200
1000
800
2018−07
2019−01
2019−07
2020−01
2020−07
Time

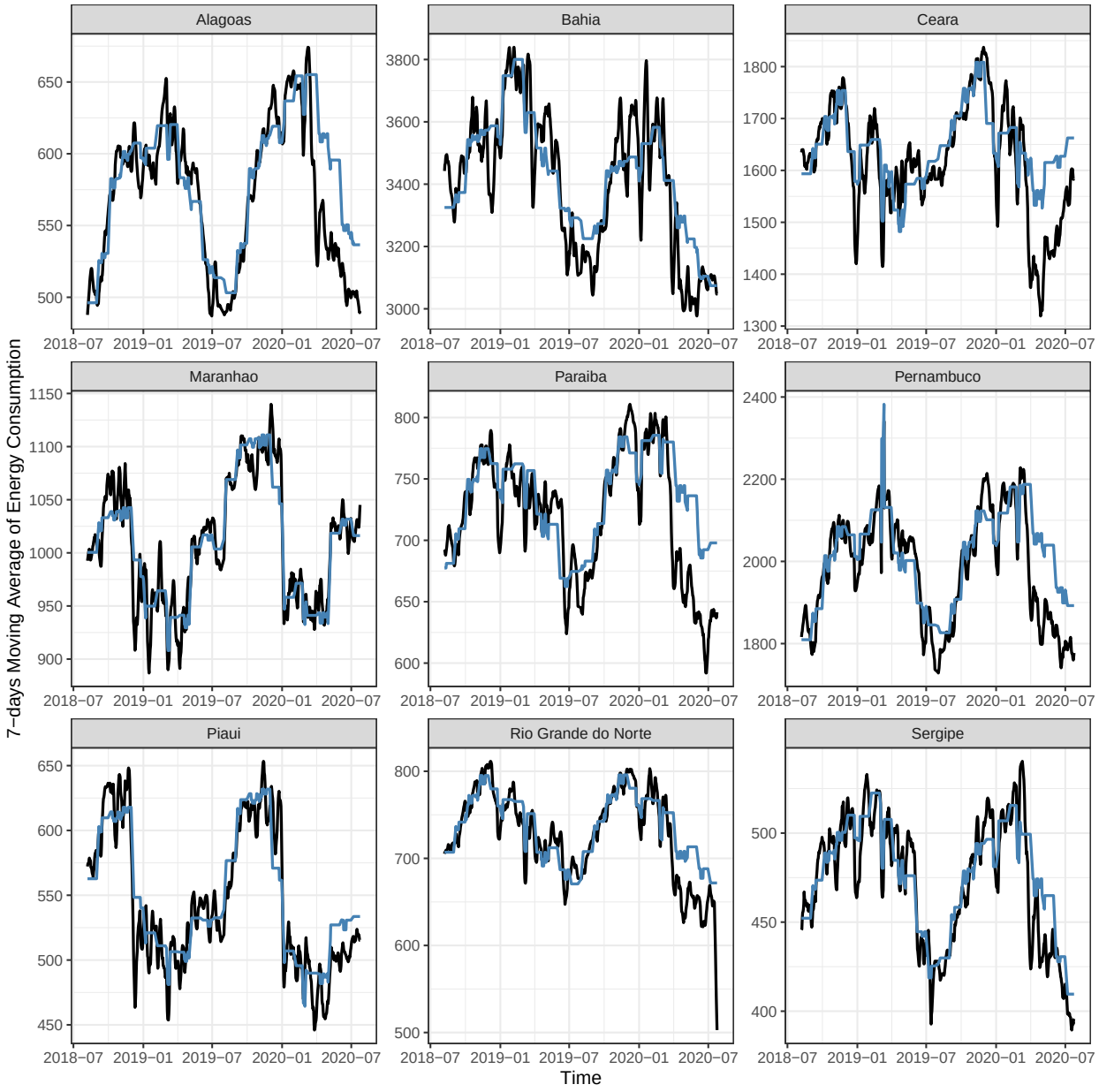
Região Centro-Oeste



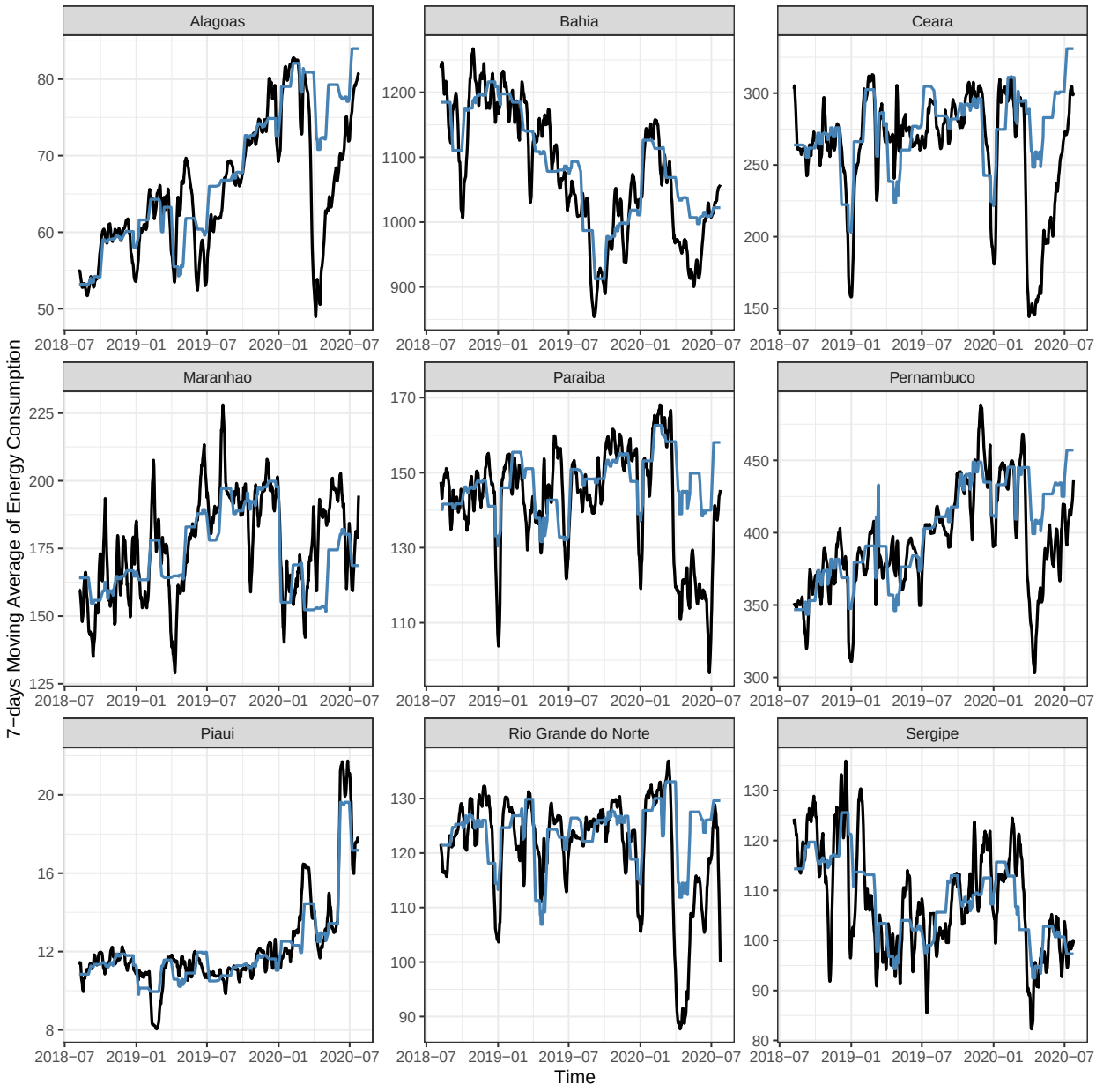
Somente ACL


Distrito Federal
Goias
Mato Grosso
Mato Grosso do Sul
7−days Moving Average of Energy Consumption
Time
2018−07
2019−01
2019−07
2020−01
2020−07

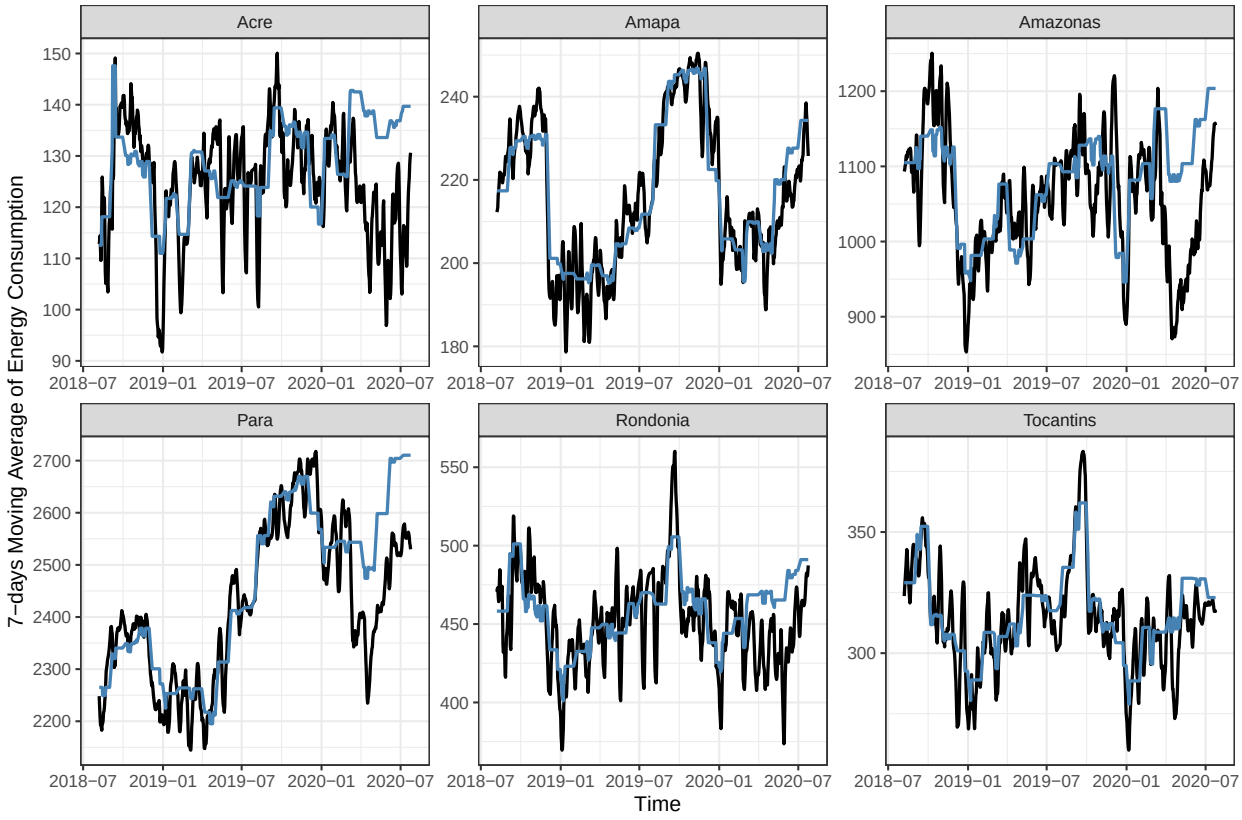
Região Nordeste



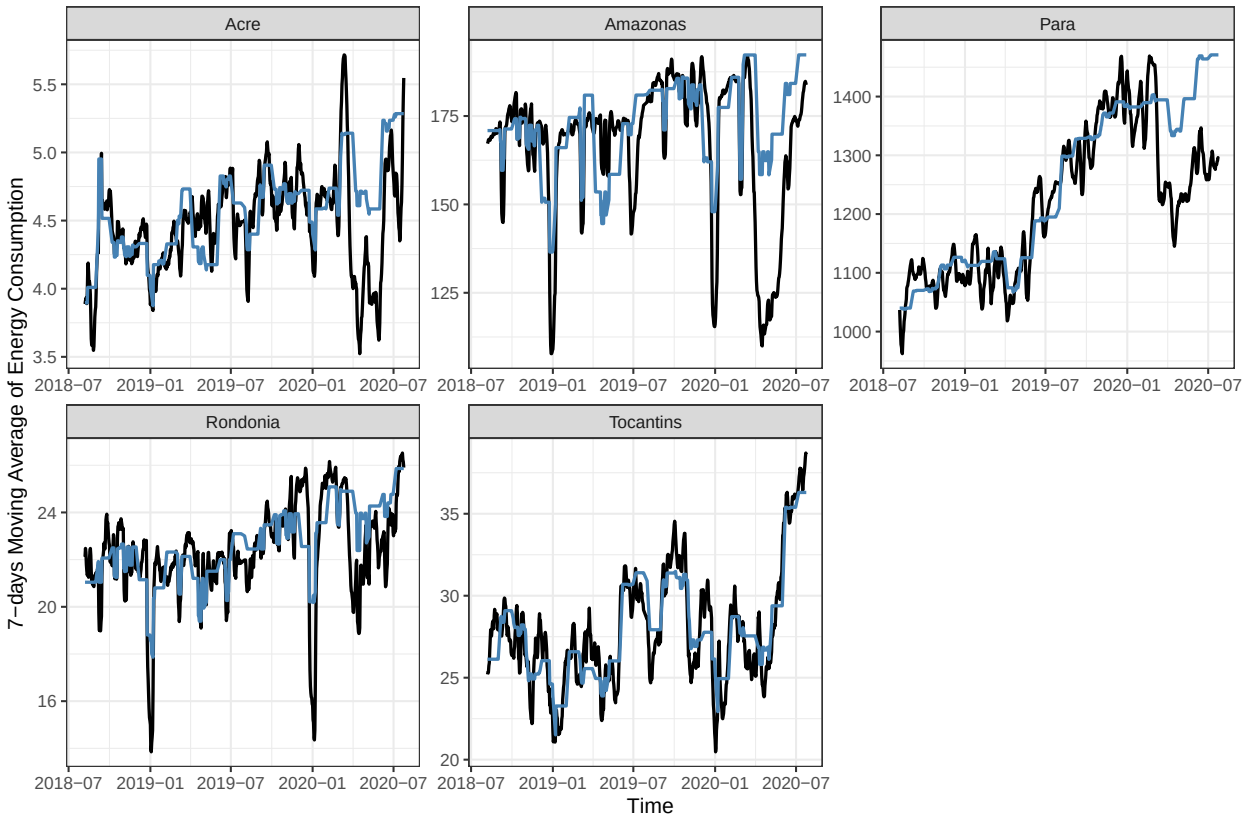
Somente ACL


Alagoas
Bahia
Ceara
Maranhao
Paraiba
Pernambuco
Piaui
Rio Grande do Norte
Sergipe
7−days Moving Average of Energy Consumption
Time
2018−07
2019−01
2019−07
2020−01
2020−07

Região Norte

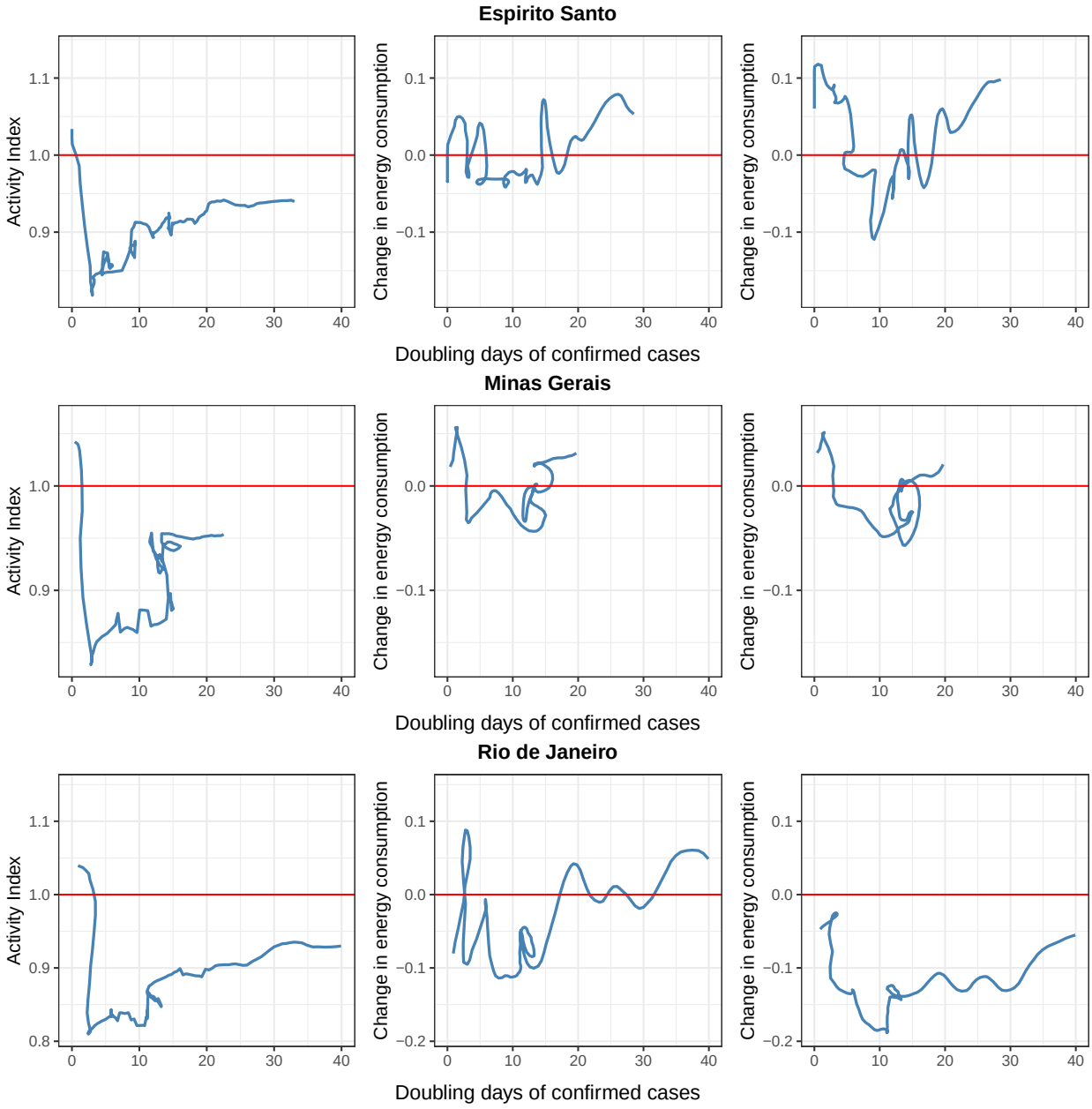


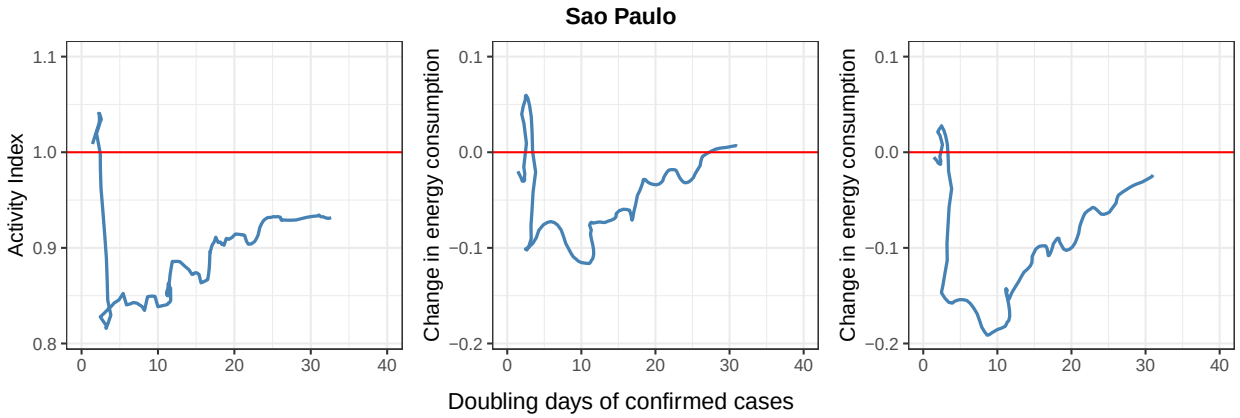
Somente ACL


Acre
Amazonas
Para
Rondonia
Tocantins
7−days Moving Average of Energy Consumption
Time
2018−07
2019−01
2019−07
2020−01
2020−07

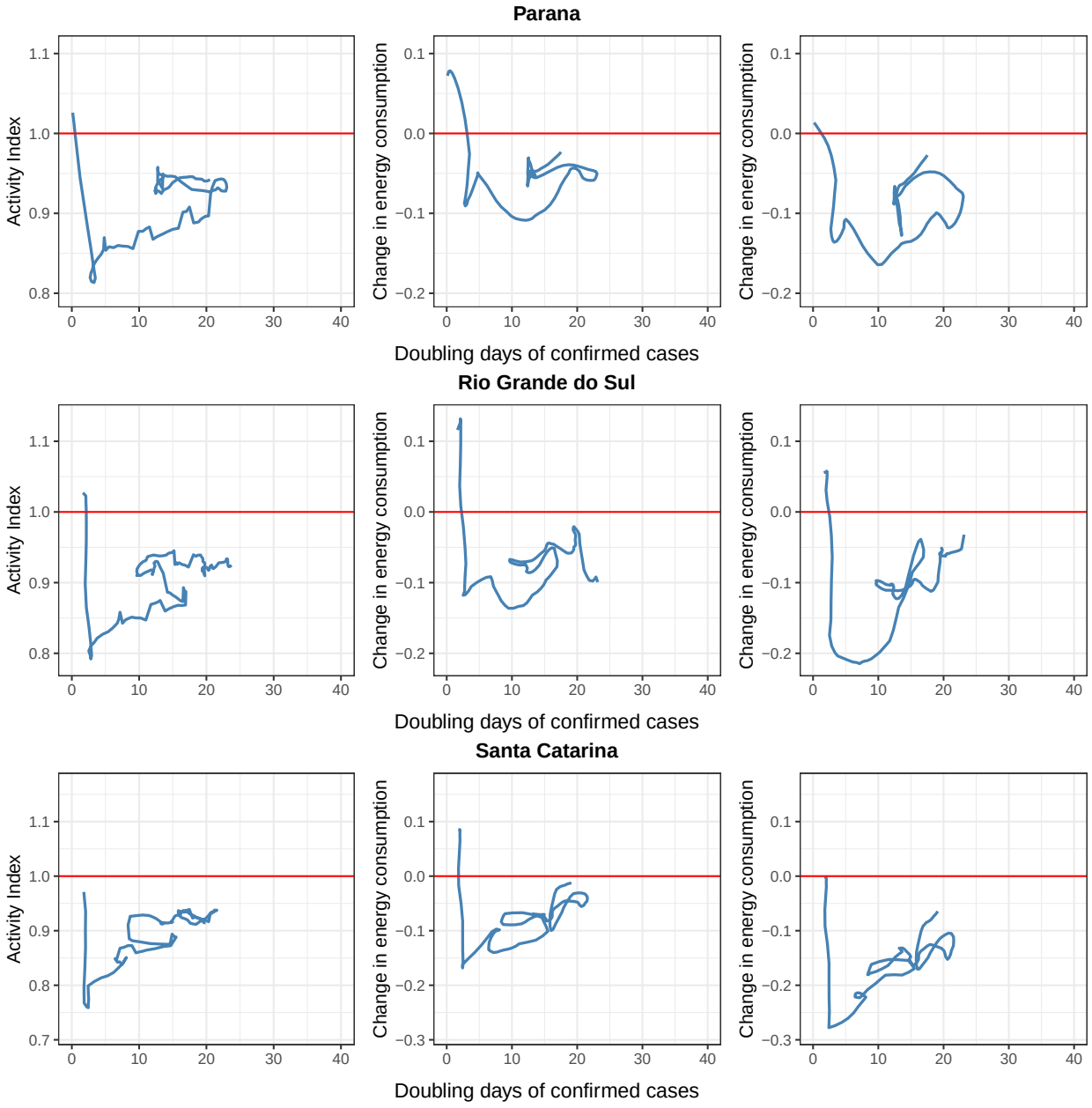
Atividade x COVID

Região Sudeste

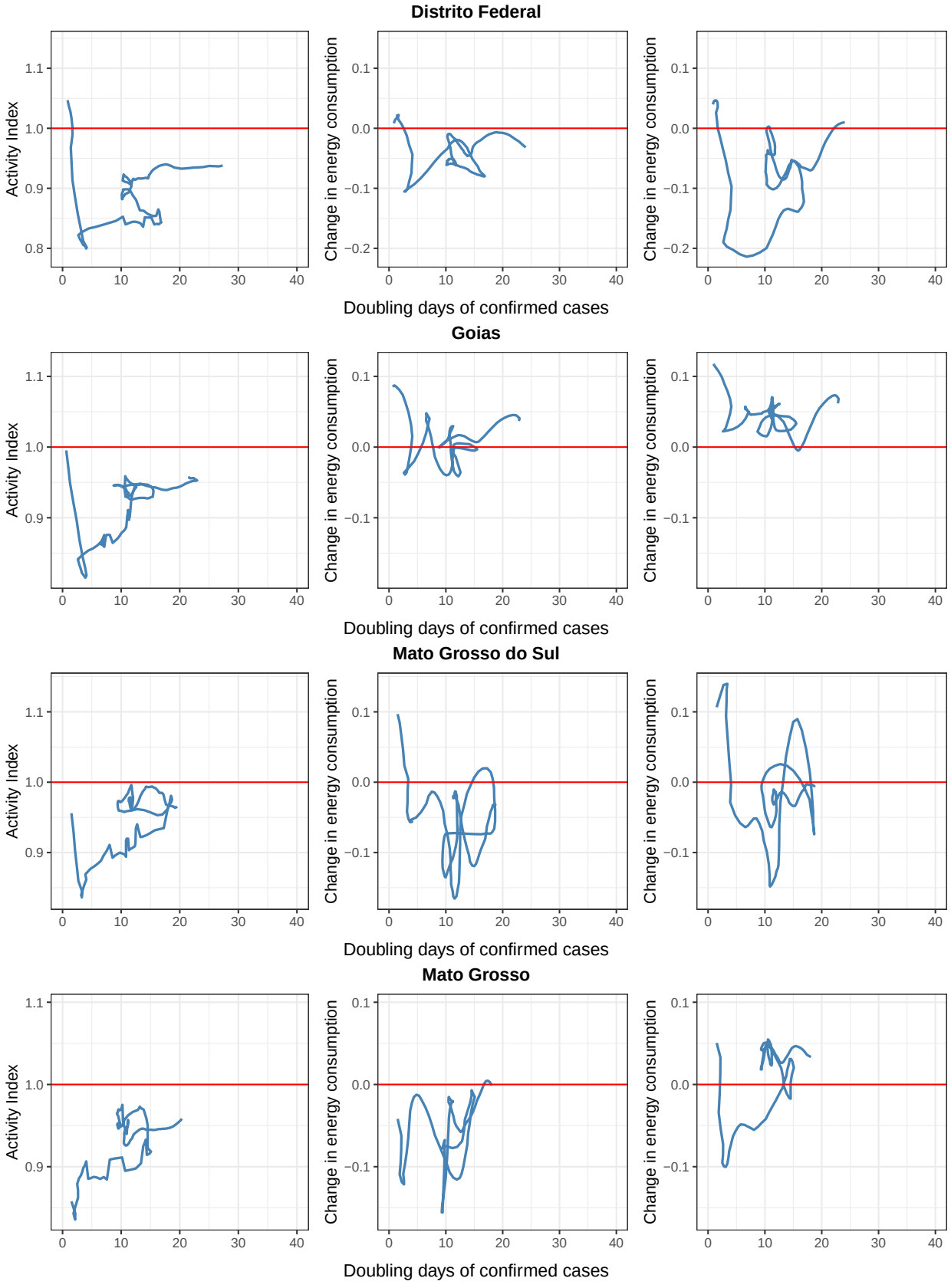



Sao Paulo
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases

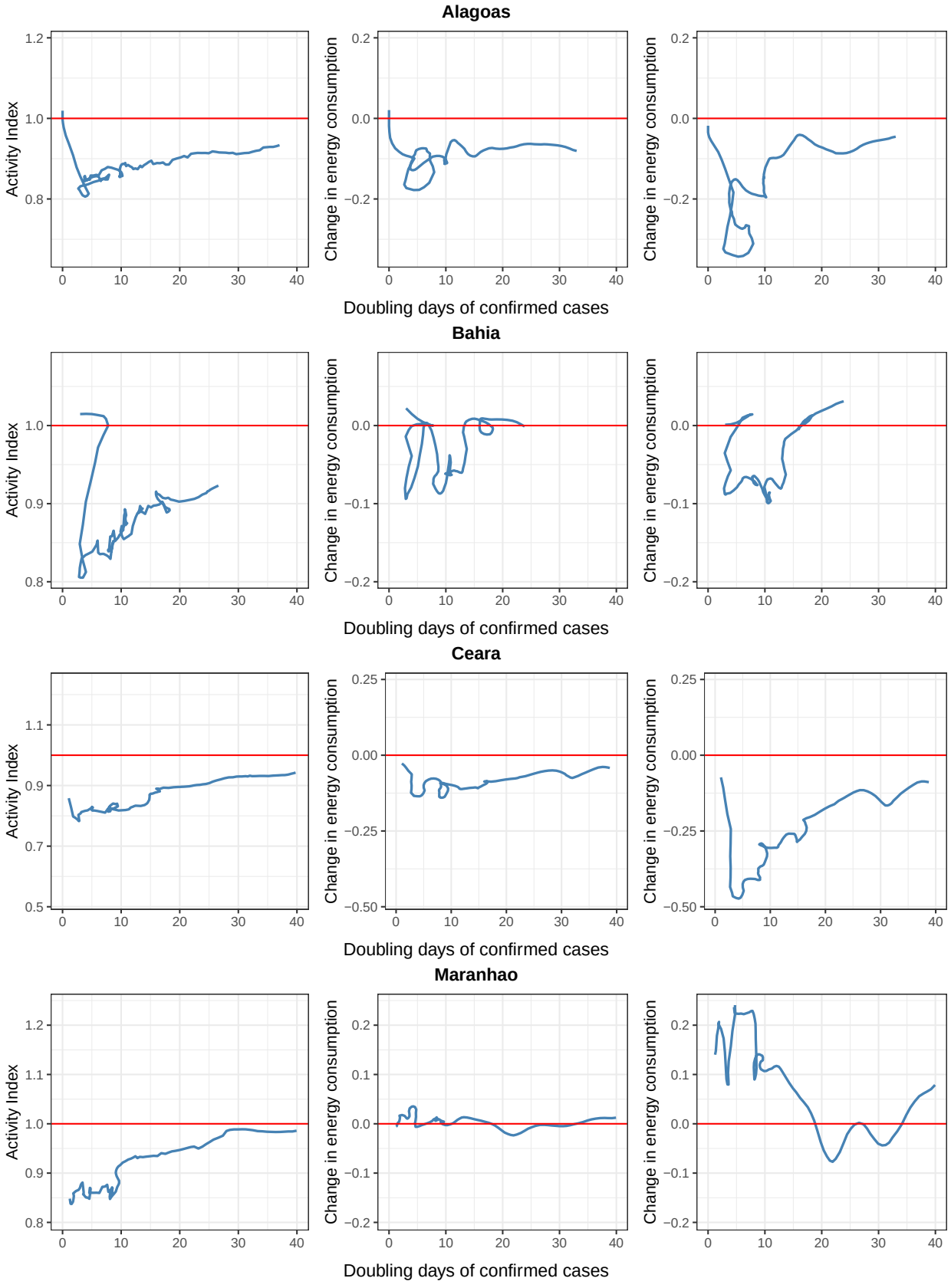
Região Sul

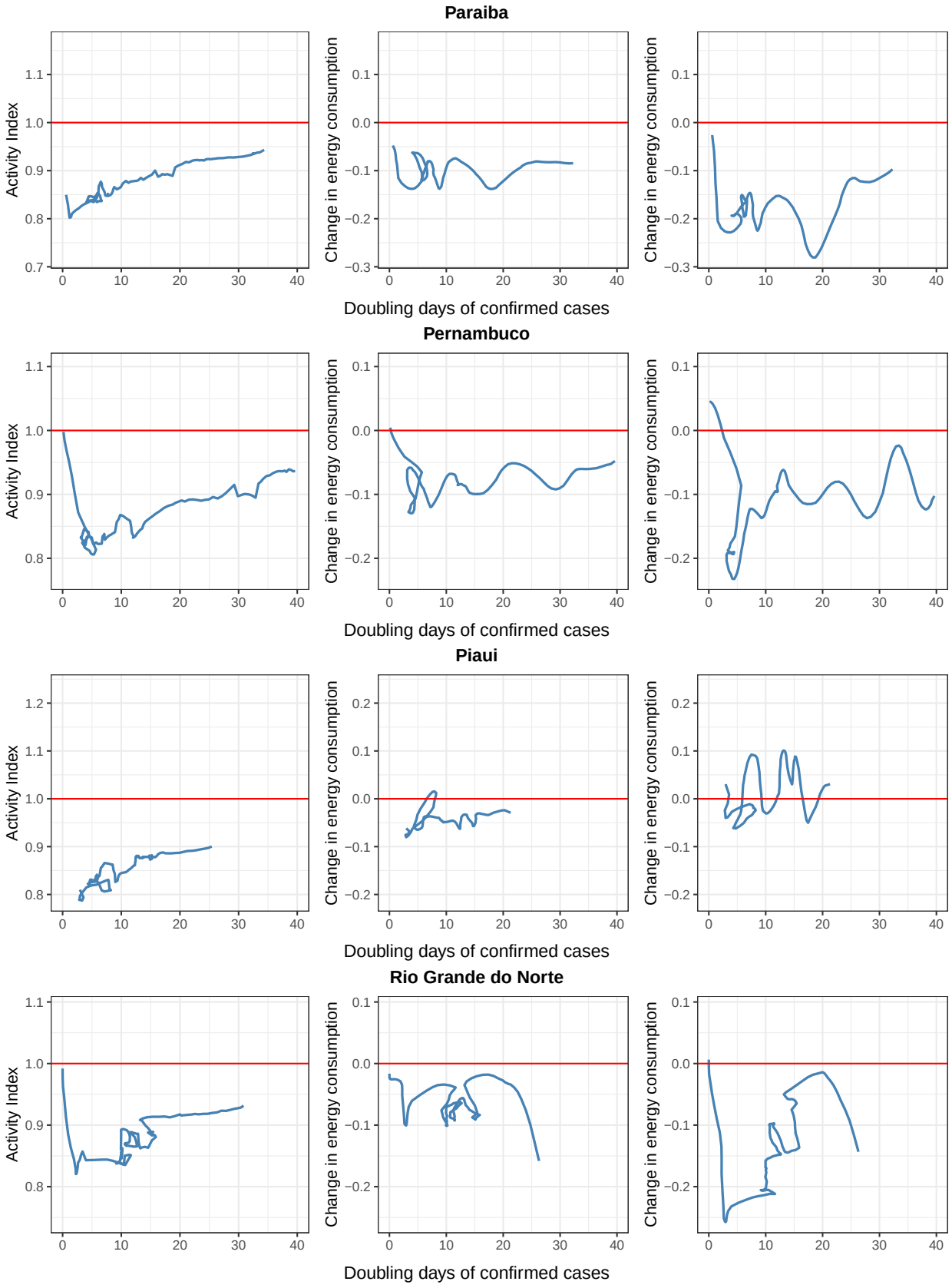

Parana
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases
Rio Grande do Sul
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases
Santa Catarina
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases

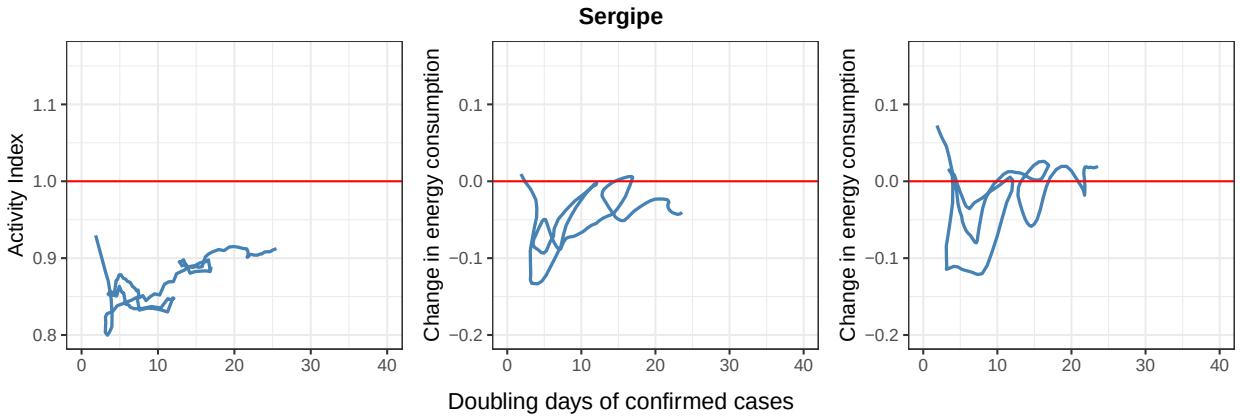
Região Centro-Oeste



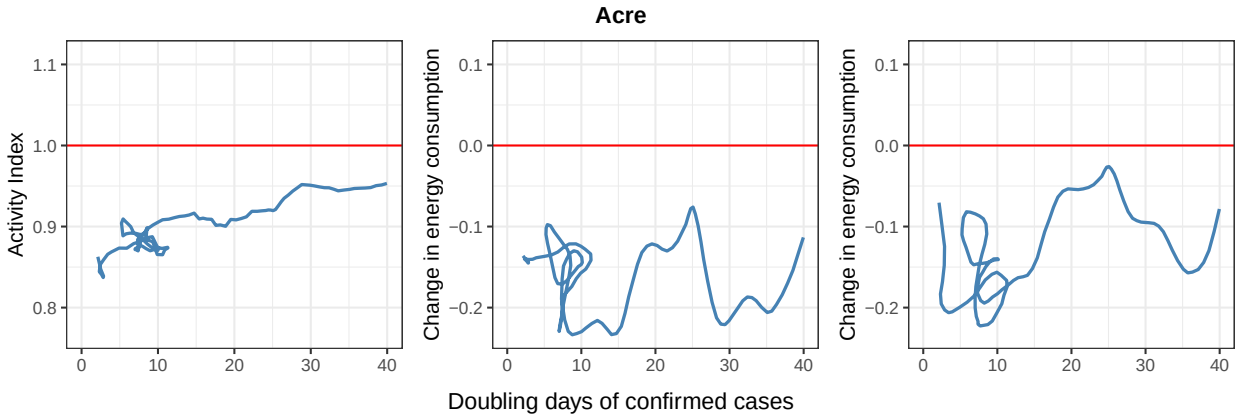
Região Nordeste

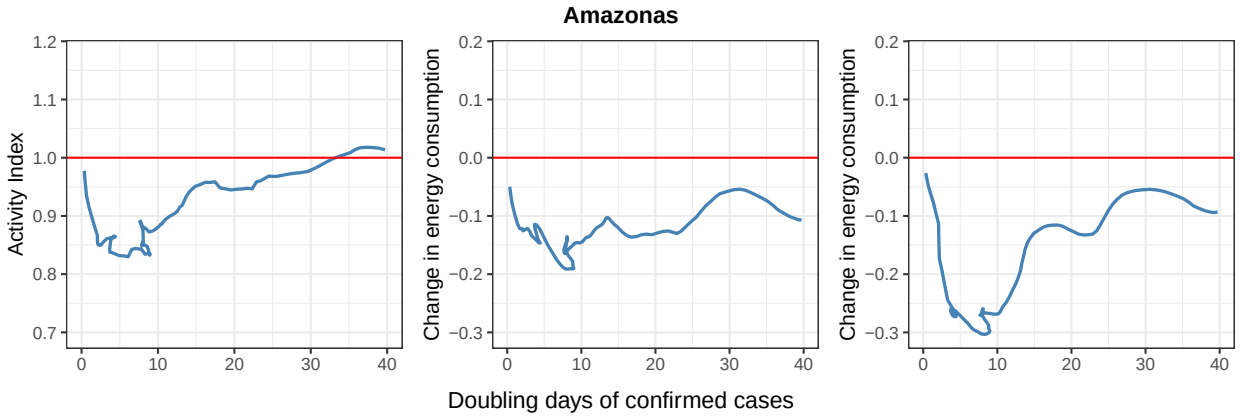


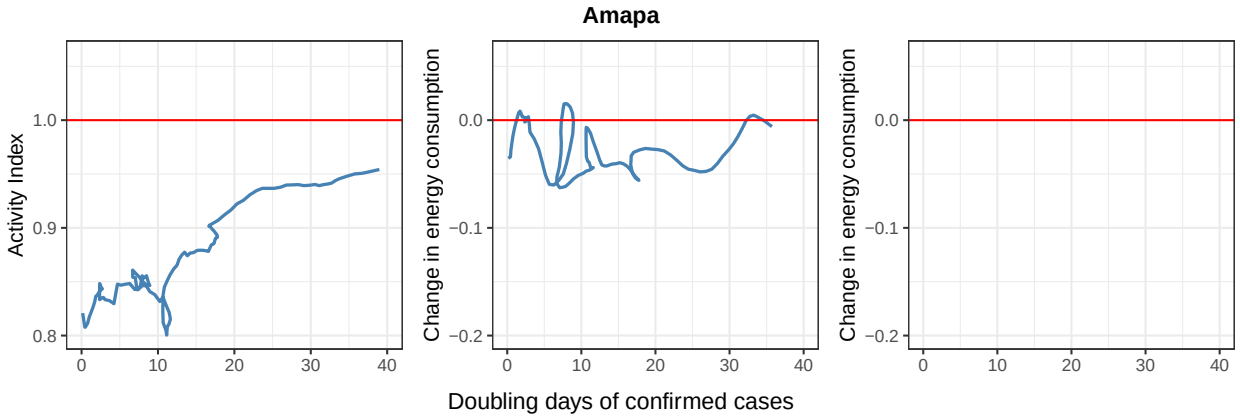

Paraiba
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases
Pernambuco
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases
Piaui
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases
Rio Grande do Norte
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases

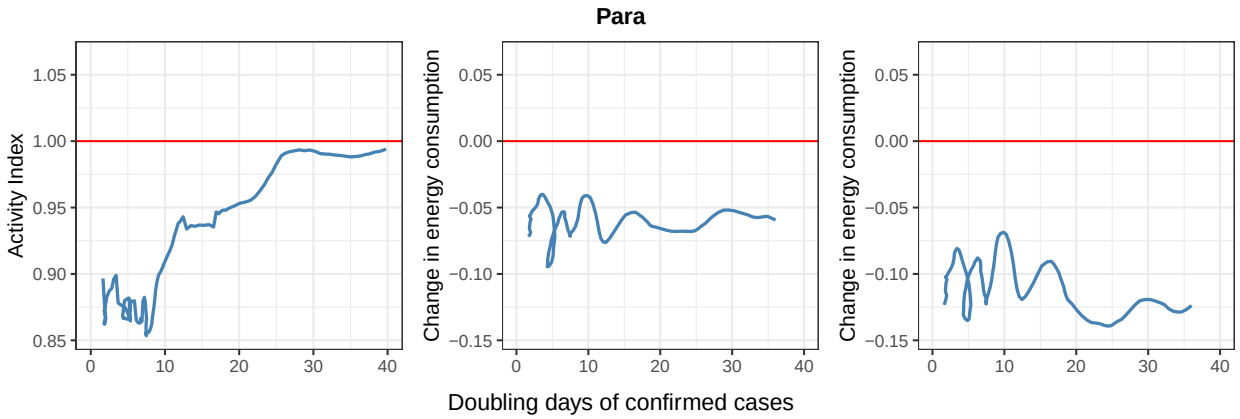

Sergipe
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases

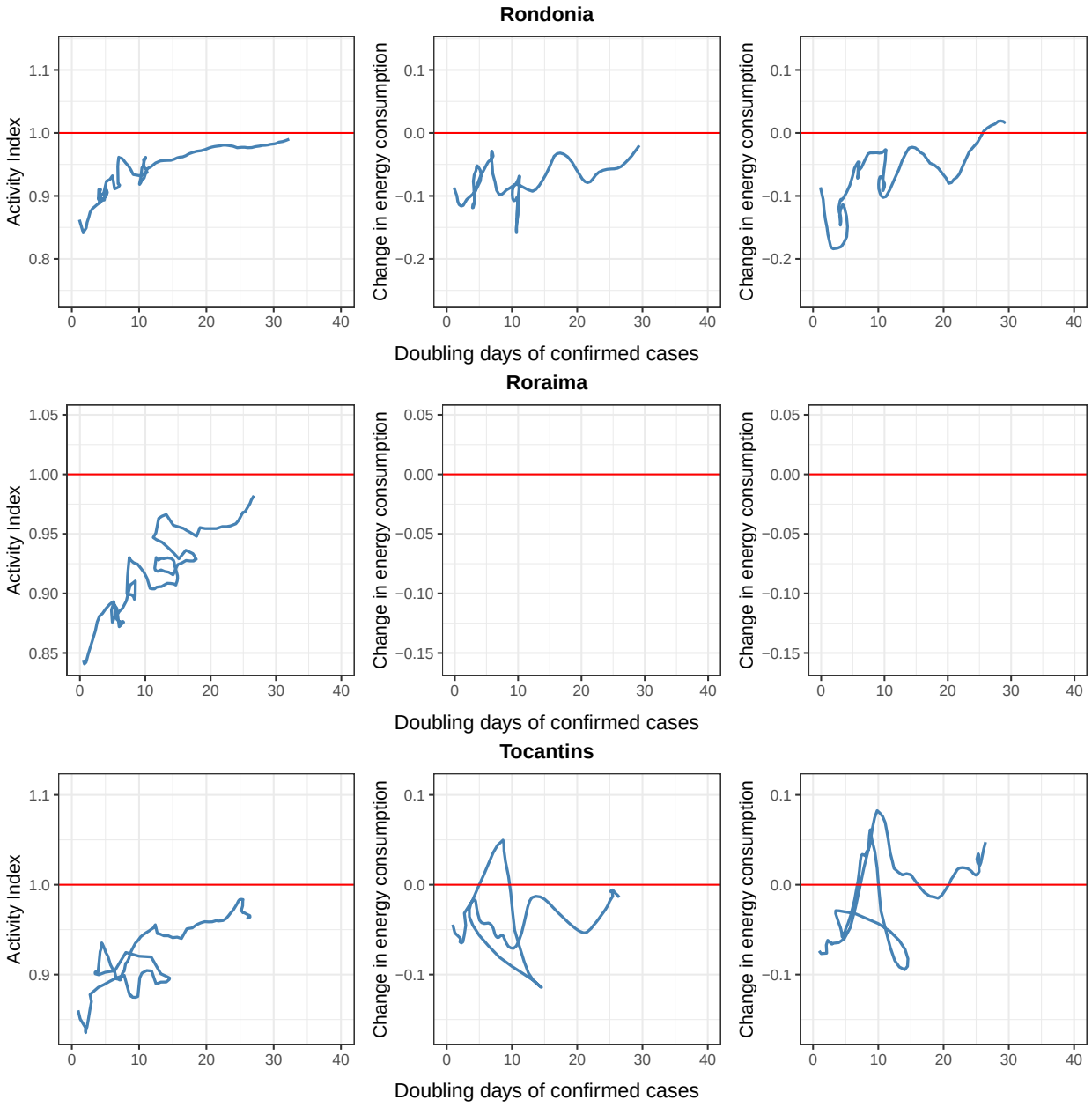
Região Norte





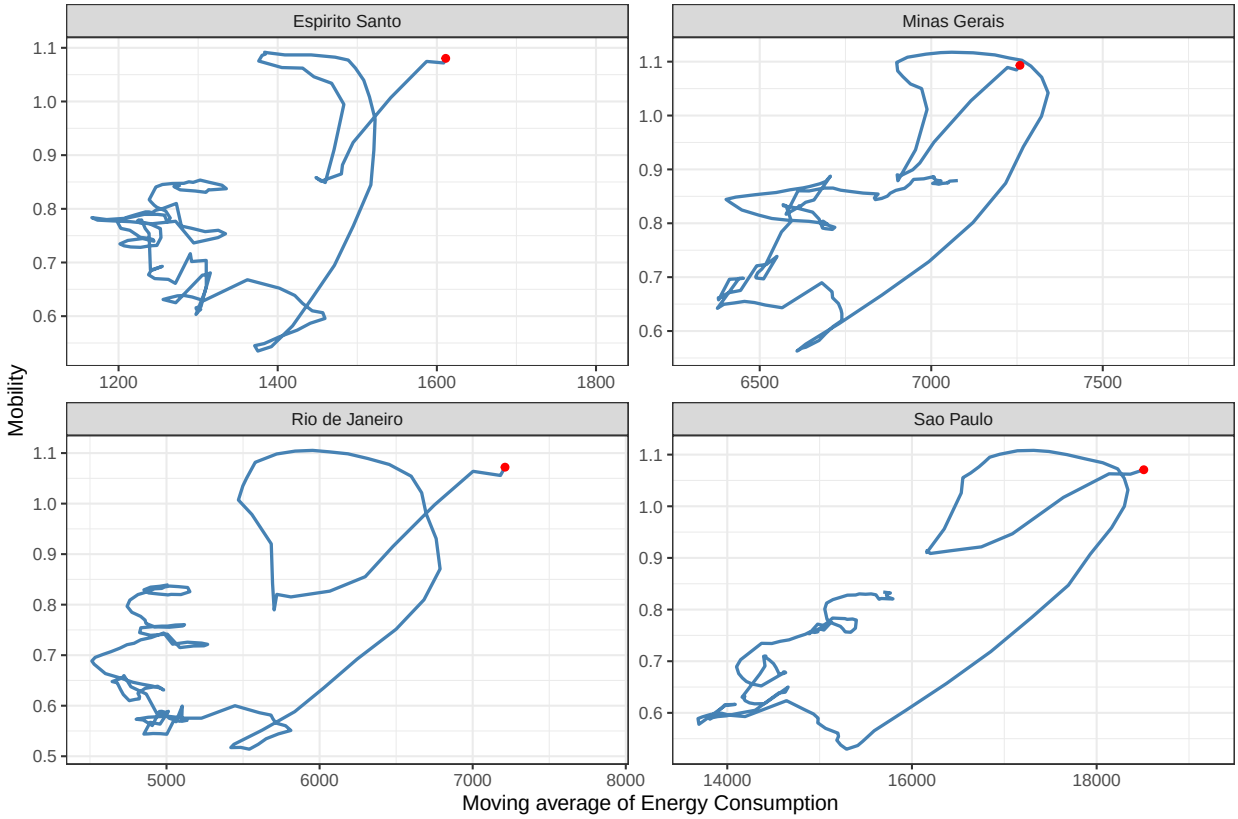




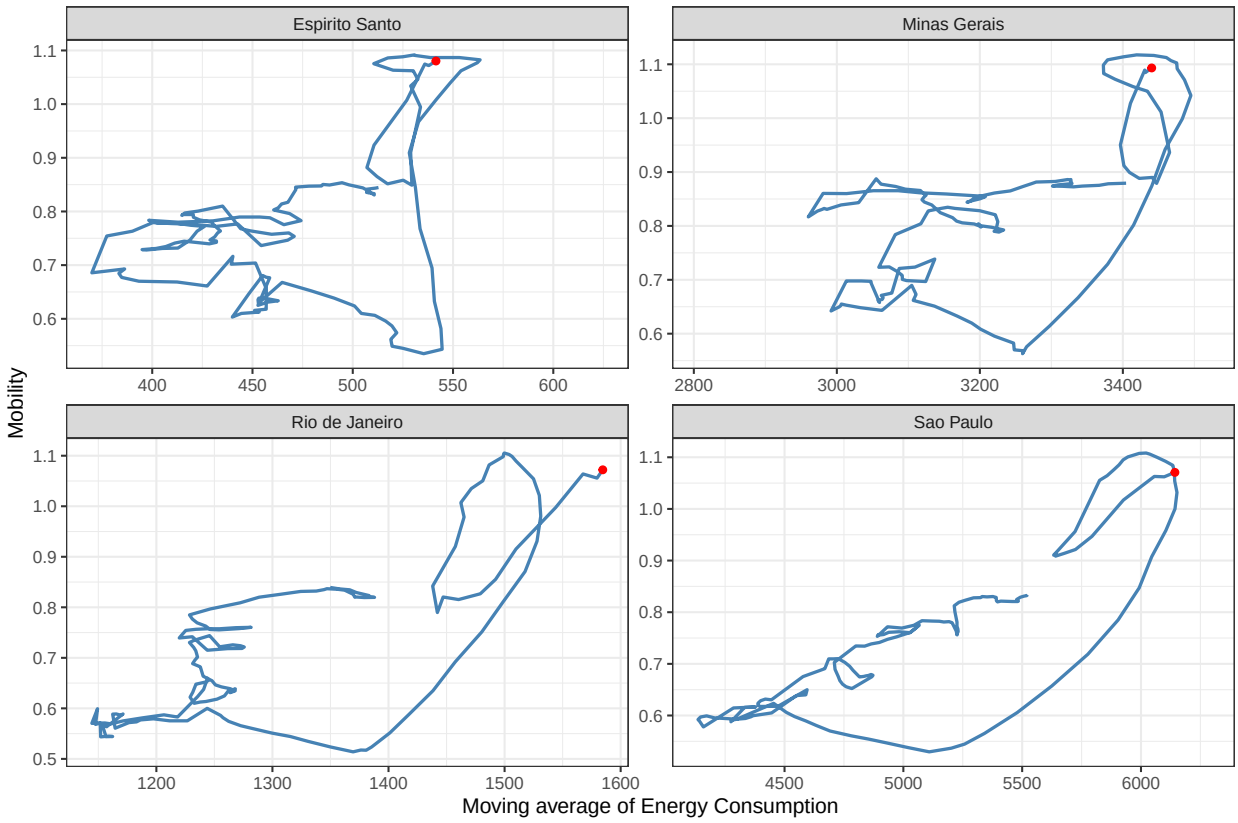

Rondonia
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases
Roraima
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases
Tocantins
Activity Index
Change in energy consumption
Change in energy consumption
Doubling days of confirmed cases

Relação Mobilidade x Consumo de Energia

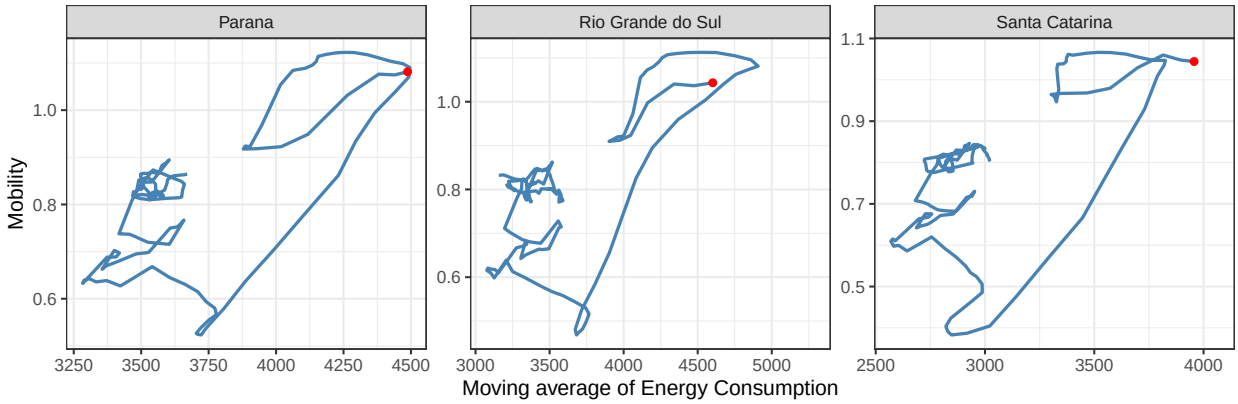
Região Sudeste



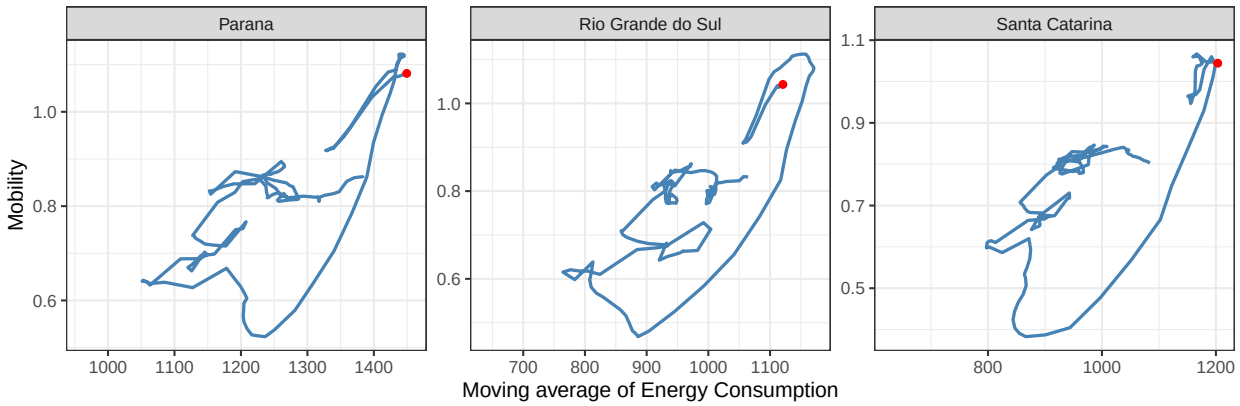
Somente ACL


Espirito Santo
Minas Gerais
Rio de Janeiro
Sao Paulo
Mobility
Moving average of Energy Consumption

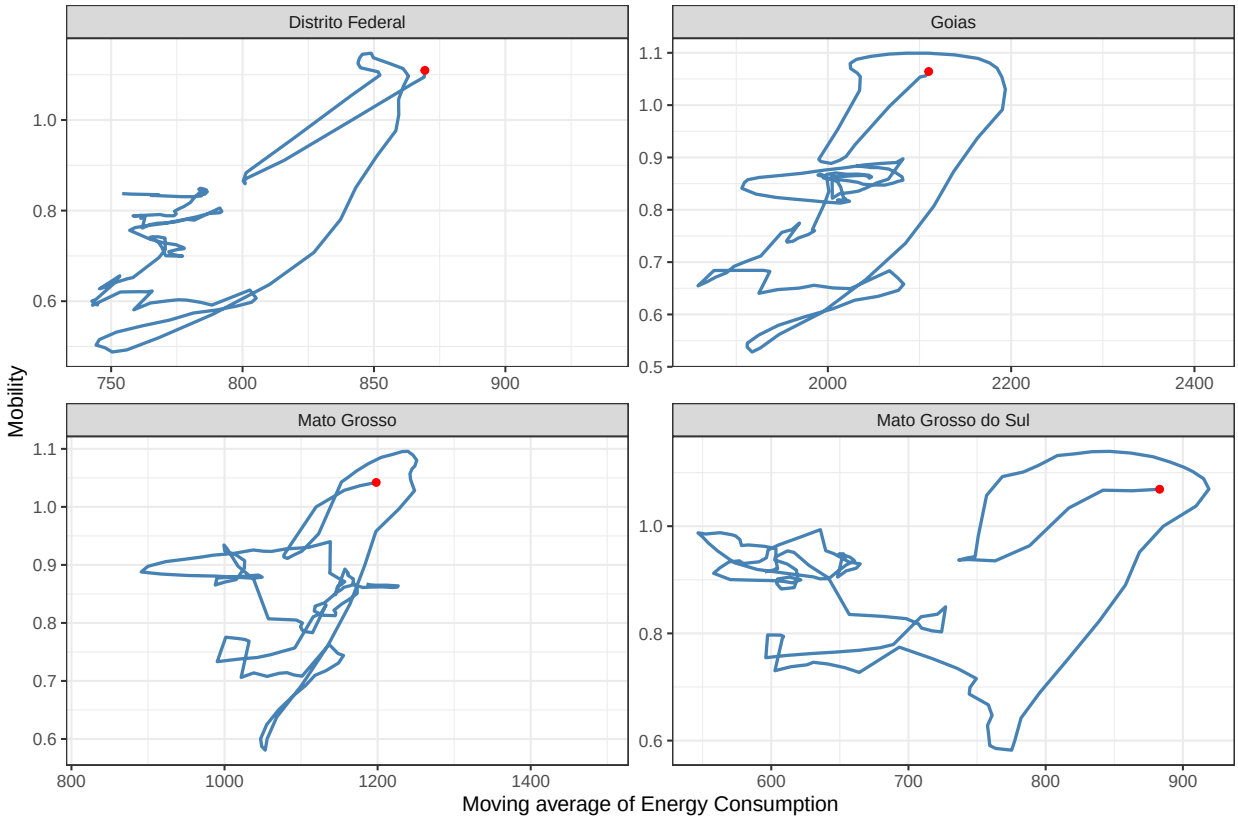
Região Sul


Parana
Rio Grande do Sul
Santa Catarina
Mobility
Moving average of Energy Consumption
1.0
0.8
0.6
1.1
0.9
0.7
0.5
3250
3500
3750
4000
4250
4500
5000
2500
3000

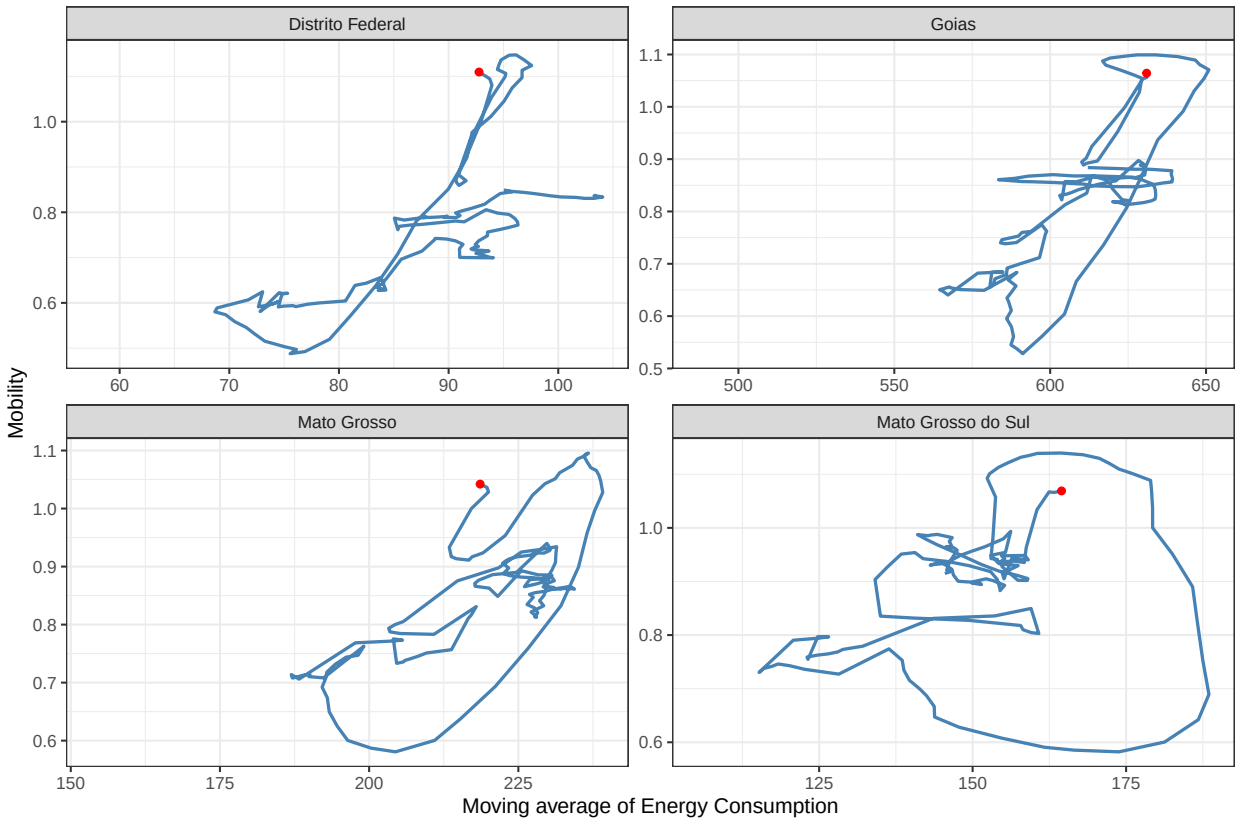
Somente ACL


Parana
Rio Grande do Sul
Santa Catarina
Mobility
Moving average of Energy Consumption
1.0
0.8
0.6
1.1
0.9
0.7
0.5
1000
1100
1200
1300
1400
700
800
900
1000
1100
800
1000
1200

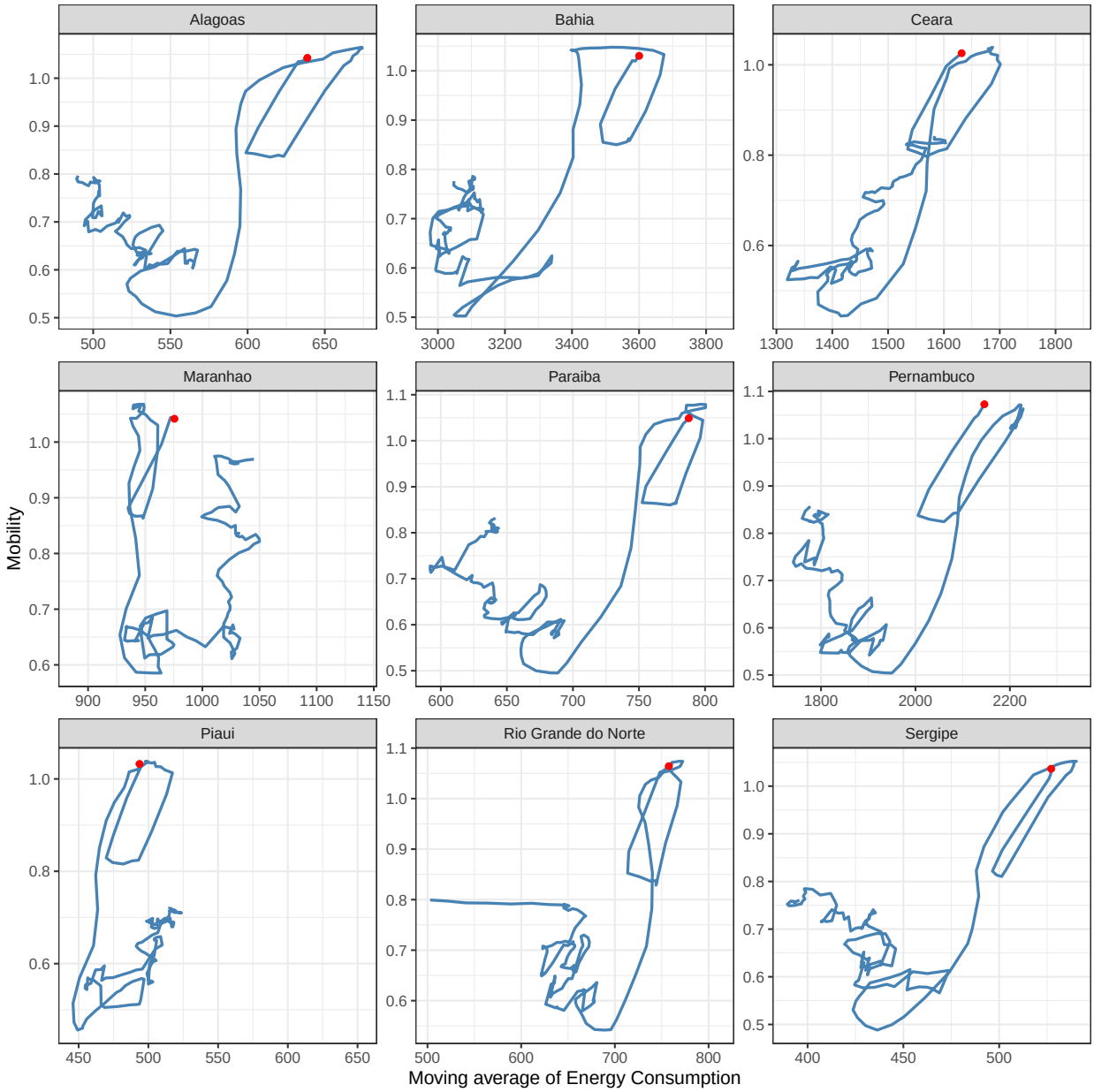
Região Centro-Oeste



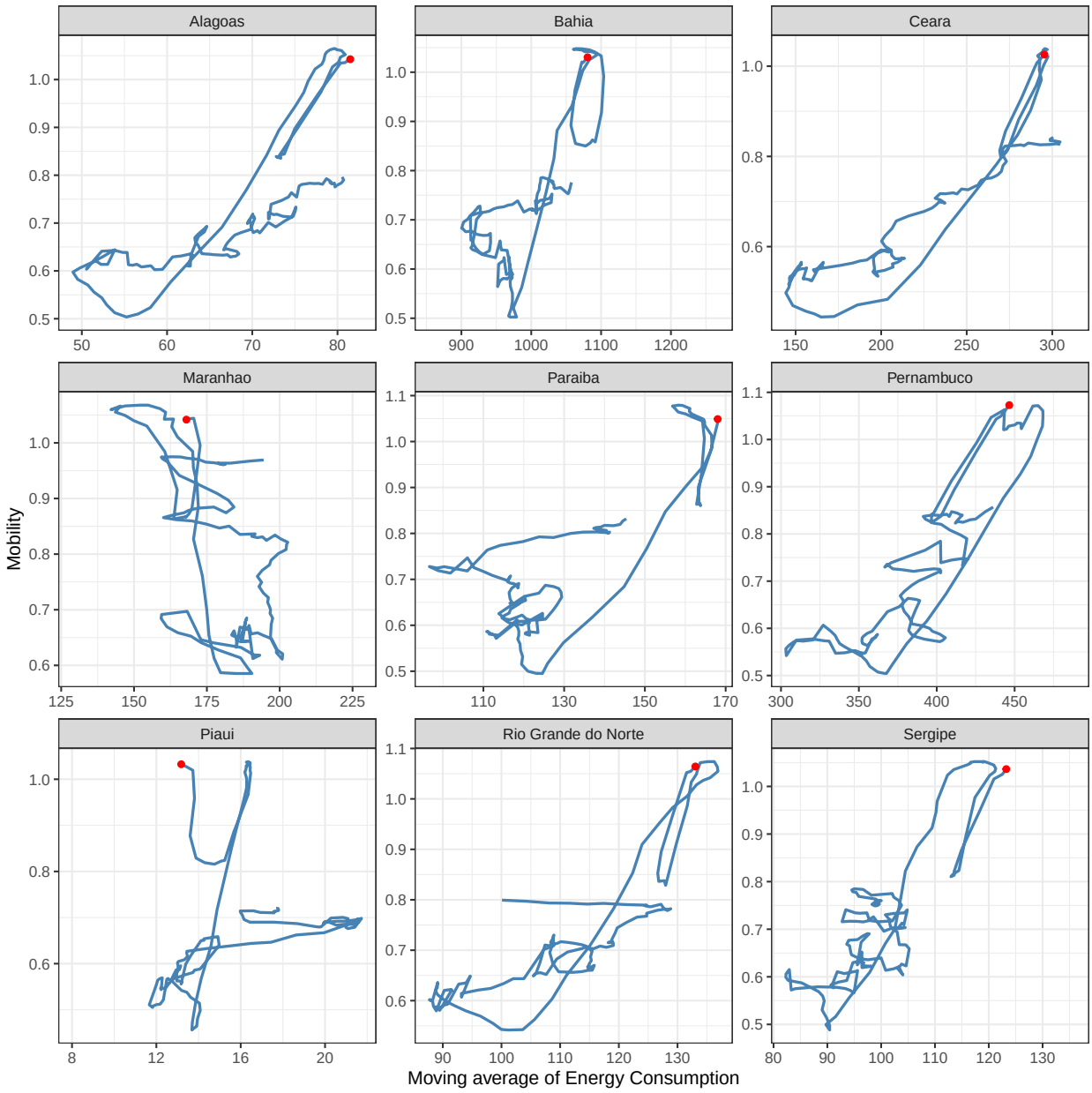
Somente ACL


Distrito Federal
Goias
Mato Grosso
Mato Grosso do Sul
Mobility
Moving average of Energy Consumption

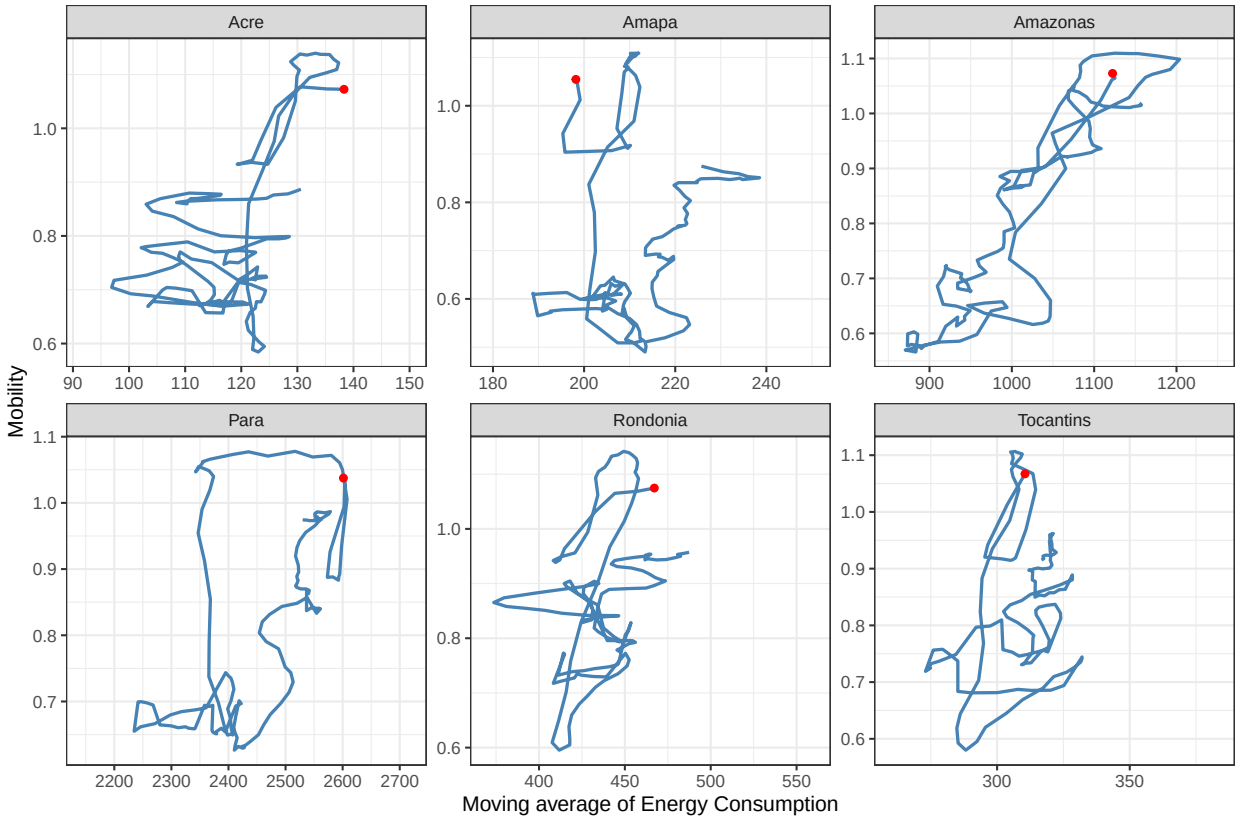
Região Nordeste



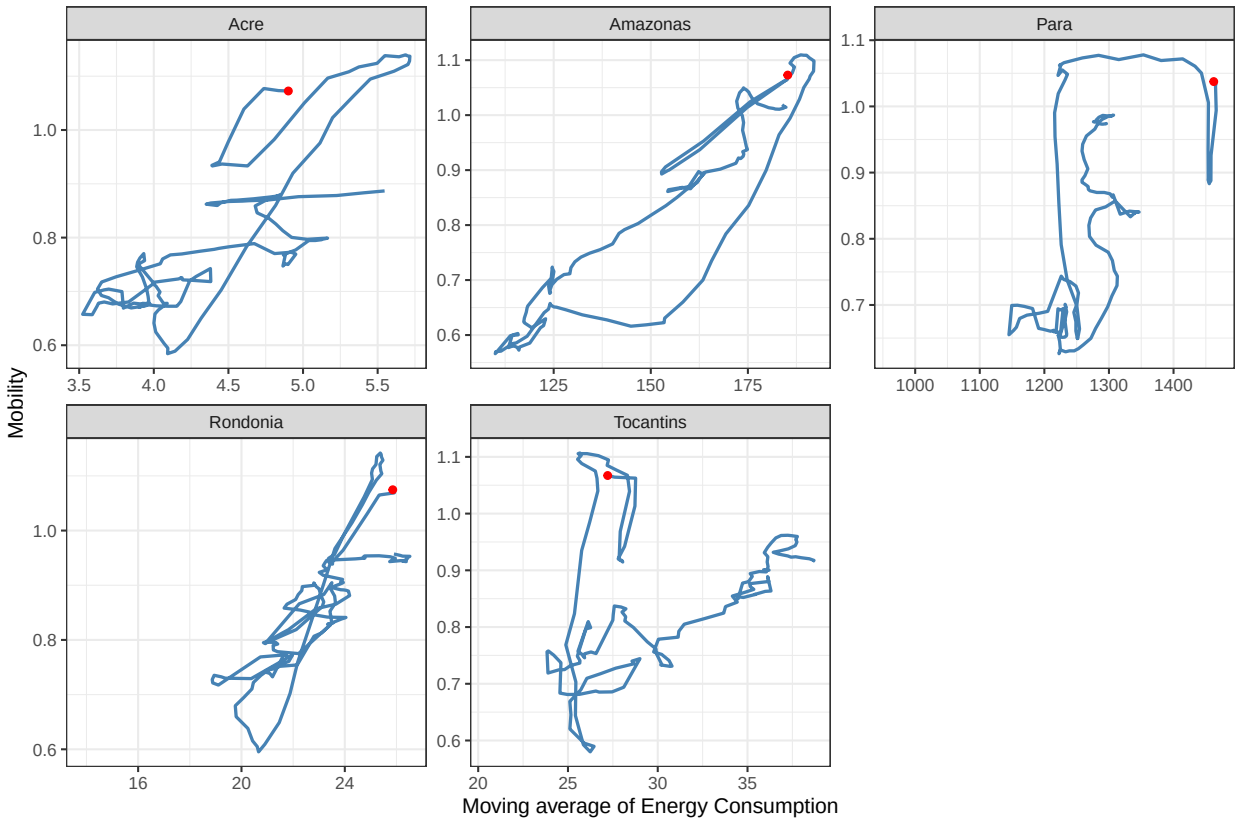
Somente ACL


Alagoas
Bahia
Ceara
Maranhao
Paraiba
Pernambuco
Piaui
Rio Grande do Norte
Sergipe
Mobility
Moving average of Energy Consumption

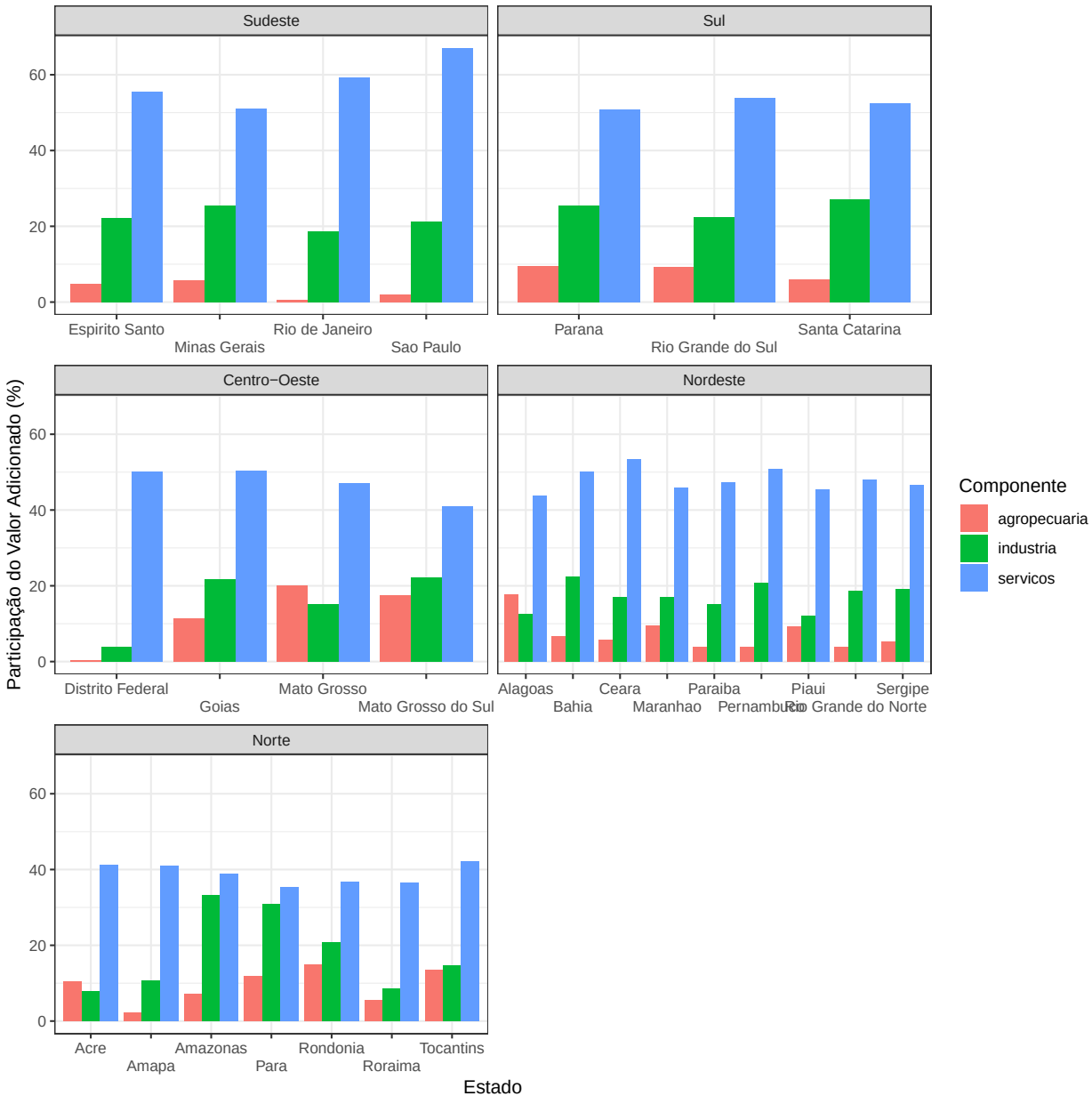
Região Norte



Somente ACL


Acre
Amazonas
Para
Rondonia
Tocantins
Mobility
Moving average of Energy Consumption

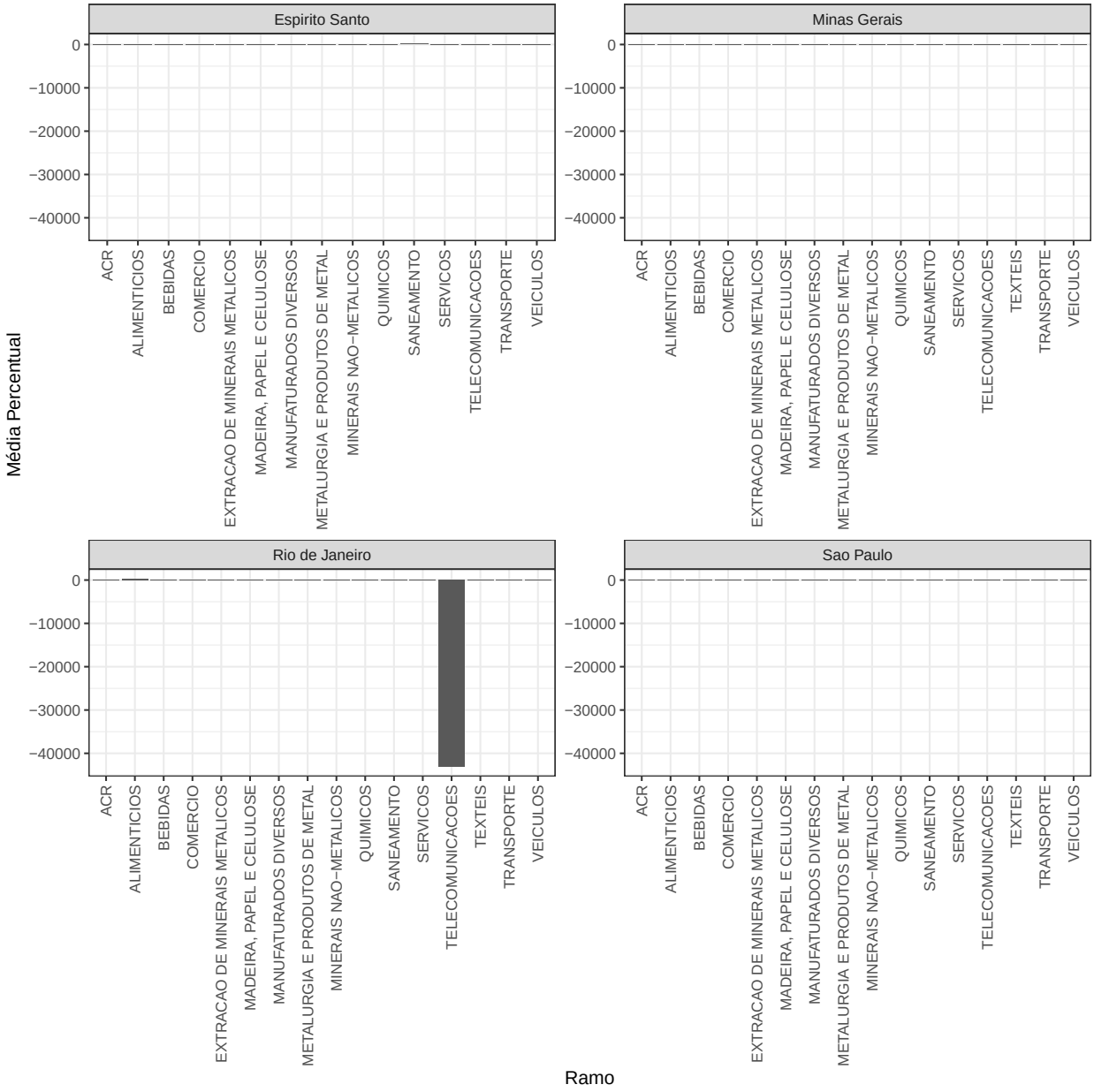
Relação entre Série de Energia e Composição do PIB?



Alteração do nível de consumo por Ramo

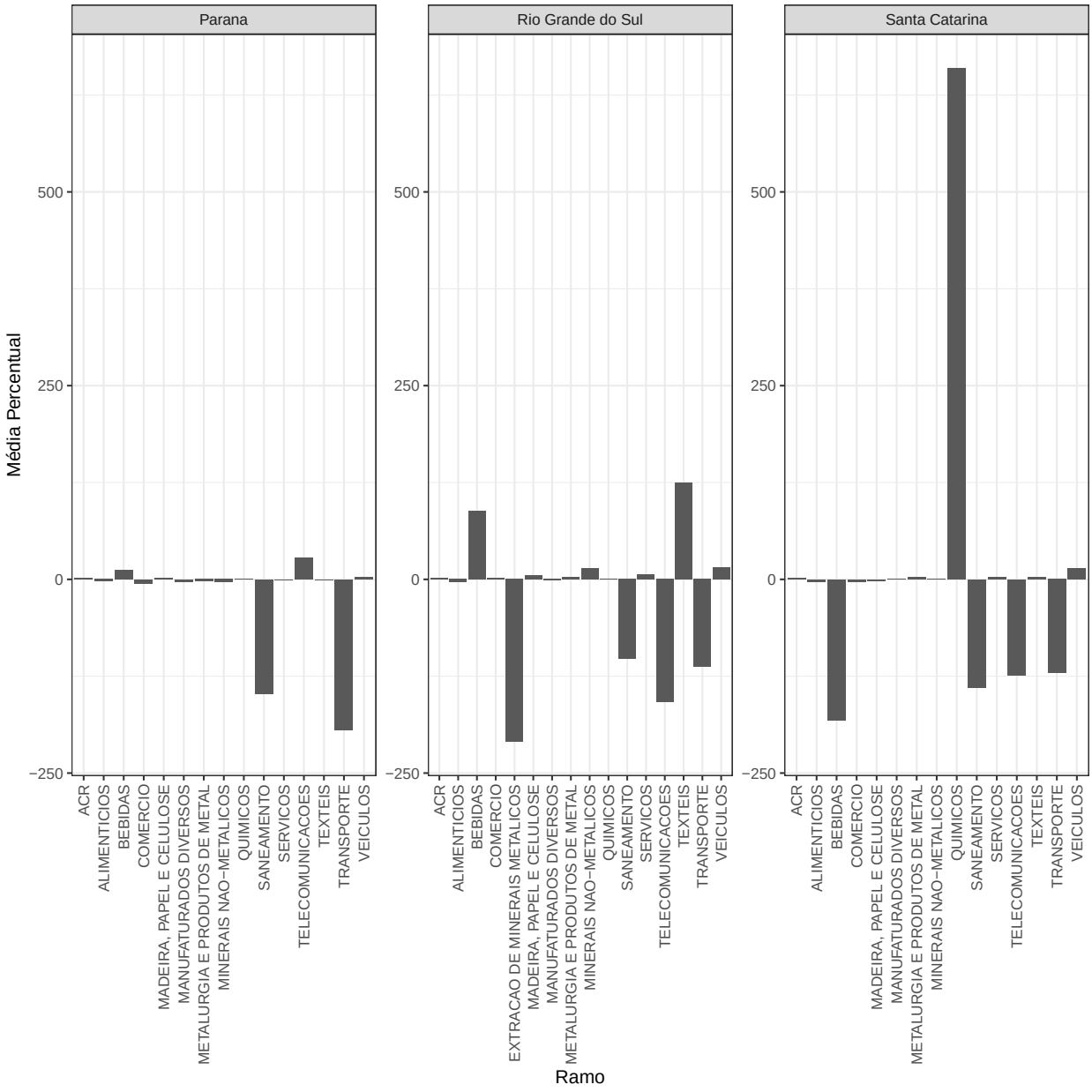
Região Sudeste

```
## `summarise()` regrouping output by 'ramo' (override with `.groups` argument)
```



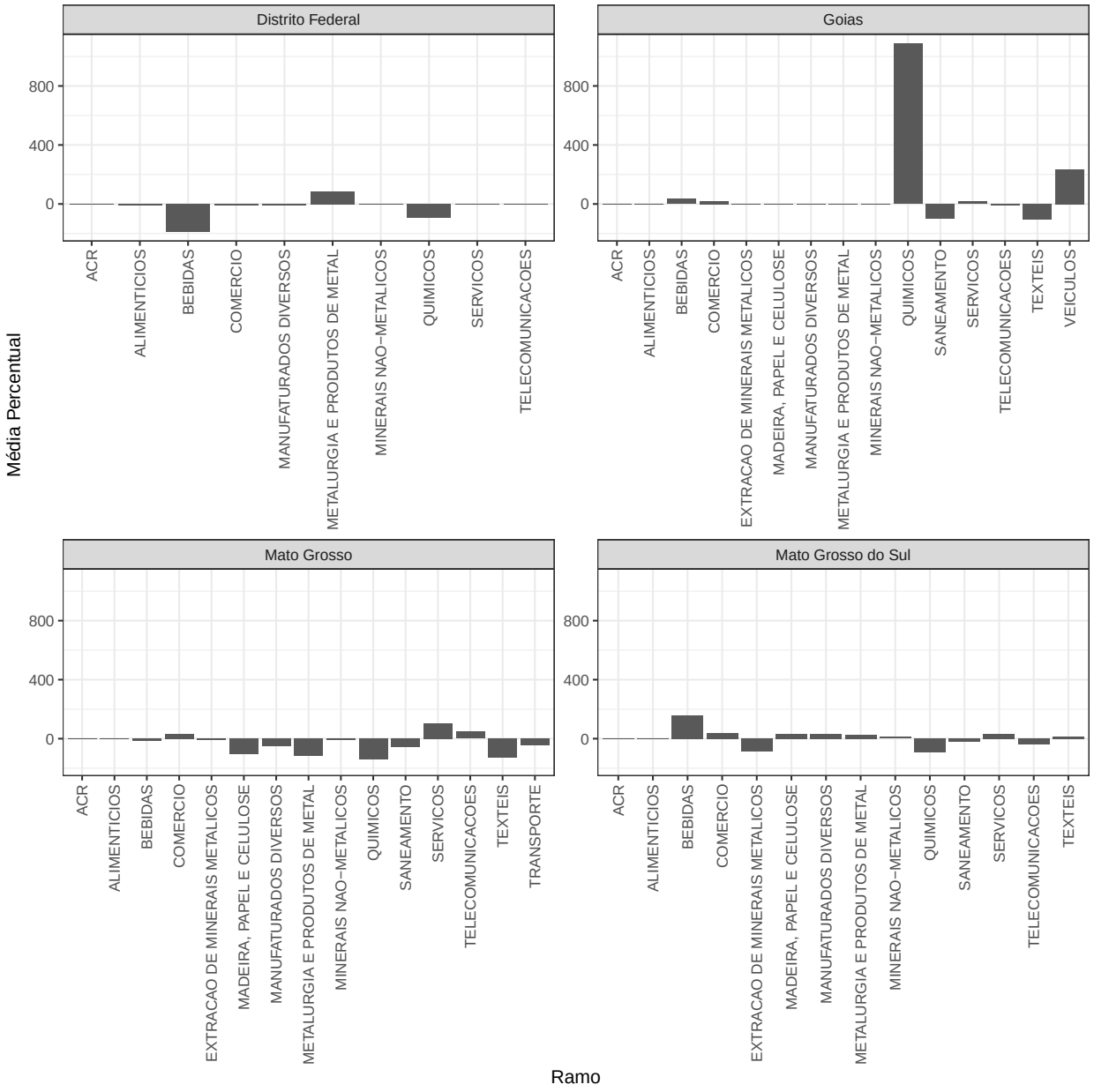
Região Sul

```
## `summarise()` regrouping output by 'ramo' (override with `.groups` argument)
```



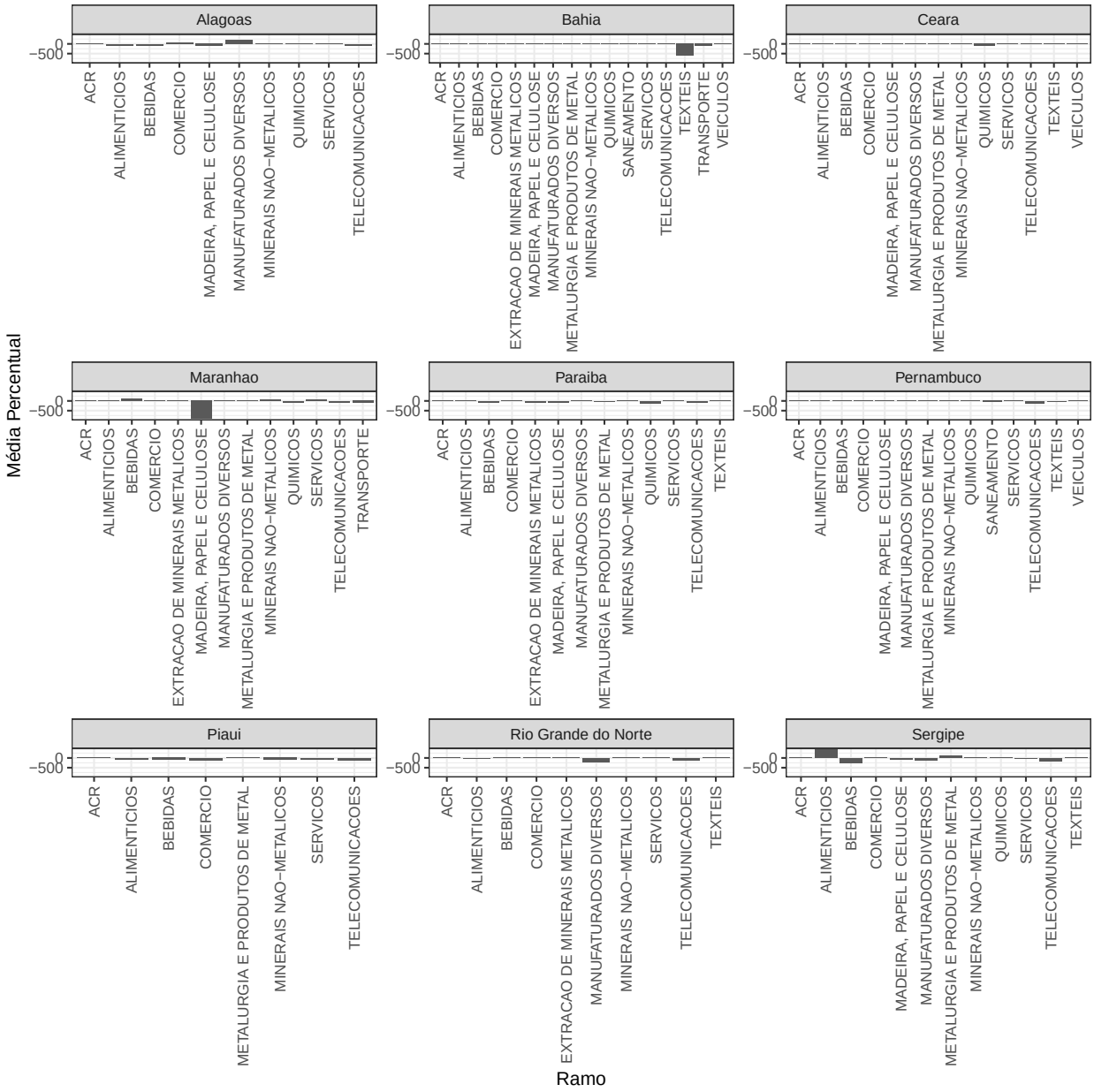
Região Centro-Oeste

```
## `summarise()` regrouping output by 'ramo' (override with `.groups` argument)
```



Região Nordeste

```
## `summarise()` regrouping output by 'ramo' (override with `.groups` argument)
```



Região Norte

```
## `summarise()` regrouping output by 'ramo' (override with `.groups` argument)
```