Chomage suite

July 17, 2020

```
[2]: import pandas as pd

     data = pd.read_excel('/home/simplon/Téléchargements/chomage_zone.xls',1,
      ↪skiprows=5)
     data_grp = data.groupby ('LIBREG', as_index = False).mean()
     data_grp
```

```
[2]:                        LIBREG   REG    2003-T1    2003-T2    2003-T3  \
     0           Auvergne-Rhône-Alpes   84.0   6.877143   7.022857   6.957143
     1      Bourgogne-Franche-Comté   27.0   6.760870   6.926087   6.891304
     2                      Bretagne   53.0   6.466667   6.627778   6.633333
     3            Centre-Val-de-Loire   24.0   7.105263   7.357895   7.373684
     4                         Corse   94.0   9.685714   9.342857   9.385714
     5                     Grand-Est   44.0   7.103226   7.306452   7.264516
     6                Hauts-de-France   32.0   9.930769  10.084615   9.880769
     7                  Ile-de-France   11.0   6.636842   6.963158   6.926316
     8                     Normandie   28.0   7.705000   7.860000   7.735000
     9             Nouvelle-Aquitaine   75.0   7.487097   7.664516   7.600000
     10                     Occitanie   76.0   9.353333   9.360000   9.226667
     11                Pays de la Loire   52.0   6.194737   6.331579   6.278947
     12   Provence-Alpes-Côte d'Azur   93.0   9.400000   9.488235   9.241176
     13                  interrégional    0.0   7.055556   7.222222   7.144444

            2003-T4    2004-T1    2004-T2    2004-T3    2004-T4  ...     2017-T4  \
     0      7.188571   7.340000   7.185714   7.245714   7.240000  ...    7.611429
     1      7.317391   7.408696   7.191304   7.234783   7.252174  ...    7.513043
     2      6.866667   6.983333   6.733333   6.805556   6.800000  ...    7.638889
     3      7.773684   7.952632   7.847368   7.926316   8.021053  ...    8.736842
     4      9.500000   9.600000   9.642857   9.942857   9.942857  ...   10.085714
     5      7.654839   7.880645   7.741935   7.912903   8.022581  ...    8.332258
     6     10.330769  10.611538  10.426923  10.542308  10.600000  ...   11.434615
     7      7.231579   7.447368   7.294737   7.384211   7.468421  ...    7.447368
     8      8.085000   8.265000   8.090000   8.255000   8.335000  ...    8.280000
     9      7.900000   8.038710   7.893548   7.938710   7.909677  ...    8.393548
     10     9.583333   9.710000   9.506667   9.583333   9.573333  ...   10.943333
     11     6.605263   6.736842   6.673684   6.763158   6.731579  ...    7.157895
     12     9.464706   9.535294   9.317647   9.429412   9.470588  ...   10.364706
```

```
13   7.500000    7.655556    7.488889    7.533333    7.600000   …    8.422222


        2018-T1     2018-T2     2018-T3     2018-T4     2019-T1     2019-T2  \
0       7.831429    7.762857    7.685714    7.405714    7.428571    7.214286
1       7.769565    7.617391    7.534783    7.260870    7.339130    7.208696
2       7.794444    7.722222    7.633333    7.372222    7.394444    7.172222
3       9.026316    8.915789    8.842105    8.573684    8.621053    8.426316
4      10.485714   10.185714    9.828571    9.542857    9.642857    9.128571
5       8.561290    8.396774    8.238710    7.993548    7.996774    7.790323
6      11.846154   11.626923   11.469231   11.092308   11.069231   10.696154
7       7.752632    7.705263    7.615789    7.336842    7.357895    7.152632
8       8.520000    8.405000    8.300000    8.015000    7.965000    7.665000
9       8.635484    8.512903    8.387097    8.154839    8.164516    7.909677
10     11.216667   11.100000   11.056667   10.706667   10.796667   10.500000
11      7.357895    7.300000    7.263158    6.989474    7.031579    6.863158
12     10.617647   10.441176   10.294118   10.005882   10.029412    9.705882
13      8.644444    8.500000    8.411111    8.144444    8.188889    7.966667


        2019-T3     2019-T4     2020-T1
0       7.240000    6.962857    6.728571
1       7.239130    6.908696    6.565217
2       7.194444    6.883333    6.661111
3       8.452632    8.052632    7.684211
4       8.957143    8.728571    8.514286
5       7.861290    7.496774    7.264516
6      10.653846   10.280769    9.911538
7       7.242105    6.947368    6.794737
8       7.645000    7.385000    7.150000
9       7.925806    7.574194    7.293548
10     10.403333    9.993333    9.603333
11      6.952632    6.763158    6.563158
12      9.600000    9.182353    8.864706
13      8.011111    7.733333    7.422222

[14 rows x 71 columns]
```
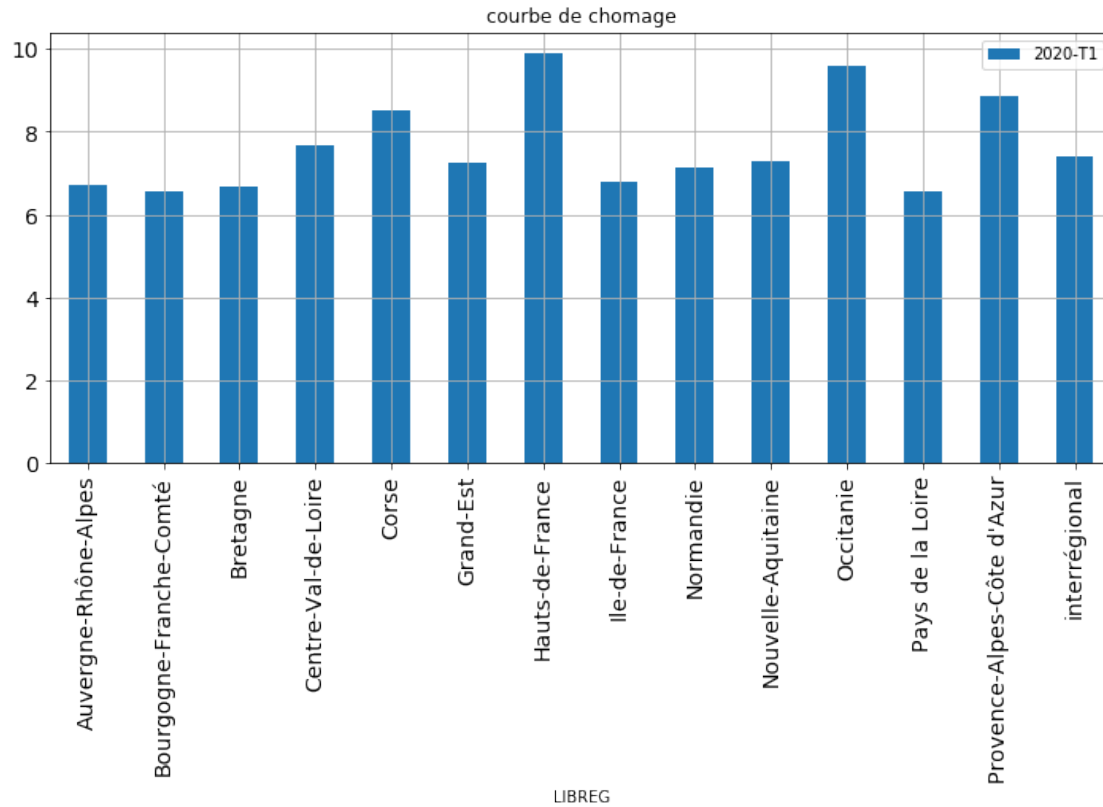
```
[4]: data_grp.plot(x = 'LIBREG', y = '2020-T1',
     title = 'courbe de chomage', figsize = (12,5), fontsize = 14, grid = True,kind␣
      ↪= 'bar')
```

```
[4]: <matplotlib.axes._subplots.AxesSubplot at 0x7fa412e58850>
```

courbe de chomage

```
[7]: data2 = data.iloc[: , range(3,73)]
     data_grp2 = data2.groupby('LIBREG').mean()
     data_grp2
```

[7]:

LIBREG	2003-T1	2003-T2	2003-T3	2003-T4 \
Auvergne-Rhône-Alpes	6.877143	7.022857	6.957143	7.188571
Bourgogne-Franche-Comté	6.760870	6.926087	6.891304	7.317391
Bretagne	6.466667	6.627778	6.633333	6.866667
Centre-Val-de-Loire	7.105263	7.357895	7.373684	7.773684
Corse	9.685714	9.342857	9.385714	9.500000
Grand-Est	7.103226	7.306452	7.264516	7.654839
Hauts-de-France	9.930769	10.084615	9.880769	10.330769
Ile-de-France	6.636842	6.963158	6.926316	7.231579
Normandie	7.705000	7.860000	7.735000	8.085000
Nouvelle-Aquitaine	7.487097	7.664516	7.600000	7.900000
Occitanie	9.353333	9.360000	9.226667	9.583333
Pays de la Loire	6.194737	6.331579	6.278947	6.605263
Provence-Alpes-Côte d'Azur	9.400000	9.488235	9.241176	9.464706
interrégional	7.055556	7.222222	7.144444	7.500000

	2004-T1	2004-T2	2004-T3	2004-T4 \
LIBREG				
Auvergne-Rhône-Alpes	7.340000	7.185714	7.245714	7.240000
Bourgogne-Franche-Comté	7.408696	7.191304	7.234783	7.252174
Bretagne	6.983333	6.733333	6.805556	6.800000
Centre-Val-de-Loire	7.952632	7.847368	7.926316	8.021053
Corse	9.600000	9.642857	9.942857	9.942857
Grand-Est	7.880645	7.741935	7.912903	8.022581
Hauts-de-France	10.611538	10.426923	10.542308	10.600000
Ile-de-France	7.447368	7.294737	7.384211	7.468421
Normandie	8.265000	8.090000	8.255000	8.335000
Nouvelle-Aquitaine	8.038710	7.893548	7.938710	7.909677
Occitanie	9.710000	9.506667	9.583333	9.573333
Pays de la Loire	6.736842	6.673684	6.763158	6.731579
Provence-Alpes-Côte d'Azur	9.535294	9.317647	9.429412	9.470588
interrégional	7.655556	7.488889	7.533333	7.600000

	2005-T1	2005-T2	…	2017-T4	2018-T1 \
LIBREG			…		
Auvergne-Rhône-Alpes	7.002857	7.174286	…	7.611429	7.831429
Bourgogne-Franche-Comté	7.117391	7.317391	…	7.513043	7.769565
Bretagne	6.650000	6.822222	…	7.638889	7.794444
Centre-Val-de-Loire	7.773684	7.873684	…	8.736842	9.026316
Corse	9.385714	9.857143	…	10.085714	10.485714
Grand-Est	7.870968	8.067742	…	8.332258	8.561290
Hauts-de-France	10.396154	10.638462	…	11.434615	11.846154
Ile-de-France	7.284211	7.326316	…	7.447368	7.752632
Normandie	8.070000	8.260000	…	8.280000	8.520000
Nouvelle-Aquitaine	7.754839	7.941935	…	8.393548	8.635484
Occitanie	9.376667	9.590000	…	10.943333	11.216667
Pays de la Loire	6.515789	6.731579	…	7.157895	7.357895
Provence-Alpes-Côte d'Azur	9.247059	9.429412	…	10.364706	10.617647
interrégional	7.433333	7.611111	…	8.422222	8.644444

	2018-T2	2018-T3	2018-T4	2019-T1 \
LIBREG				
Auvergne-Rhône-Alpes	7.762857	7.685714	7.405714	7.428571
Bourgogne-Franche-Comté	7.617391	7.534783	7.260870	7.339130
Bretagne	7.722222	7.633333	7.372222	7.394444
Centre-Val-de-Loire	8.915789	8.842105	8.573684	8.621053
Corse	10.185714	9.828571	9.542857	9.642857
Grand-Est	8.396774	8.238710	7.993548	7.996774
Hauts-de-France	11.626923	11.469231	11.092308	11.069231
Ile-de-France	7.705263	7.615789	7.336842	7.357895
Normandie	8.405000	8.300000	8.015000	7.965000
Nouvelle-Aquitaine	8.512903	8.387097	8.154839	8.164516
Occitanie	11.100000	11.056667	10.706667	10.796667

```
Pays de la Loire                 7.300000   7.263158   6.989474   7.031579
Provence-Alpes-Côte d'Azur  10.441176  10.294118  10.005882  10.029412
interrégional                    8.500000   8.411111   8.144444   8.188889


                              2019-T2    2019-T3    2019-T4    2020-T1
LIBREG
Auvergne-Rhône-Alpes          7.214286   7.240000   6.962857   6.728571
Bourgogne-Franche-Comté       7.208696   7.239130   6.908696   6.565217
Bretagne                      7.172222   7.194444   6.883333   6.661111
Centre-Val-de-Loire           8.426316   8.452632   8.052632   7.684211
Corse                         9.128571   8.957143   8.728571   8.514286
Grand-Est                     7.790323   7.861290   7.496774   7.264516
Hauts-de-France              10.696154  10.653846  10.280769   9.911538
Ile-de-France                 7.152632   7.242105   6.947368   6.794737
Normandie                     7.665000   7.645000   7.385000   7.150000
Nouvelle-Aquitaine            7.909677   7.925806   7.574194   7.293548
Occitanie                    10.500000  10.403333   9.993333   9.603333
Pays de la Loire              6.863158   6.952632   6.763158   6.563158
Provence-Alpes-Côte d'Azur    9.705882   9.600000   9.182353   8.864706
interrégional                 7.966667   8.011111   7.733333   7.422222

[14 rows x 69 columns]
```

```
[8]:  data_trans = data_grp2.transpose()
      data_trans
```

```
[8]:  LIBREG    Auvergne-Rhône-Alpes   Bourgogne-Franche-Comté    Bretagne  \
      2003-T1               6.877143                   6.760870   6.466667
      2003-T2               7.022857                   6.926087   6.627778
      2003-T3               6.957143                   6.891304   6.633333
      2003-T4               7.188571                   7.317391   6.866667
      2004-T1               7.340000                   7.408696   6.983333
      …                          …                          …          …
      2019-T1               7.428571                   7.339130   7.394444
      2019-T2               7.214286                   7.208696   7.172222
      2019-T3               7.240000                   7.239130   7.194444
      2019-T4               6.962857                   6.908696   6.883333
      2020-T1               6.728571                   6.565217   6.661111


      LIBREG    Centre-Val-de-Loire      Corse   Grand-Est   Hauts-de-France  \
      2003-T1               7.105263   9.685714    7.103226          9.930769
      2003-T2               7.357895   9.342857    7.306452         10.084615
      2003-T3               7.373684   9.385714    7.264516          9.880769
      2003-T4               7.773684   9.500000    7.654839         10.330769
      2004-T1               7.952632   9.600000    7.880645         10.611538
      …                          …          …           …                 …
      2019-T1               8.621053   9.642857    7.996774         11.069231
```

```
2019-T2              8.426316  9.128571   7.790323          10.696154
2019-T3              8.452632  8.957143   7.861290          10.653846
2019-T4              8.052632  8.728571   7.496774          10.280769
2020-T1              7.684211  8.514286   7.264516           9.911538

LIBREG   Ile-de-France  Normandie  Nouvelle-Aquitaine  Occitanie  \
2003-T1       6.636842      7.705            7.487097   9.353333
2003-T2       6.963158      7.860            7.664516   9.360000
2003-T3       6.926316      7.735            7.600000   9.226667
2003-T4       7.231579      8.085            7.900000   9.583333
2004-T1       7.447368      8.265            8.038710   9.710000
…                  …          …                  …          …
2019-T1       7.357895      7.965            8.164516  10.796667
2019-T2       7.152632      7.665            7.909677  10.500000
2019-T3       7.242105      7.645            7.925806  10.403333
2019-T4       6.947368      7.385            7.574194   9.993333
2020-T1       6.794737      7.150            7.293548   9.603333

LIBREG   Pays de la Loire  Provence-Alpes-Côte d'Azur  interrégional
2003-T1           6.194737                    9.400000       7.055556
2003-T2           6.331579                    9.488235       7.222222
2003-T3           6.278947                    9.241176       7.144444
2003-T4           6.605263                    9.464706       7.500000
2004-T1           6.736842                    9.535294       7.655556
…                      …                          …              …
2019-T1           7.031579                   10.029412       8.188889
2019-T2           6.863158                    9.705882       7.966667
2019-T3           6.952632                    9.600000       8.011111
2019-T4           6.763158                    9.182353       7.733333
2020-T1           6.563158                    8.864706       7.422222

[69 rows x 14 columns]
```

```
[9]: data_trans = data_trans.reset_index()
     data_trans
```

```
[9]: LIBREG    index  Auvergne-Rhône-Alpes  Bourgogne-Franche-Comté  Bretagne  \
     0       2003-T1              6.877143                 6.760870  6.466667
     1       2003-T2              7.022857                 6.926087  6.627778
     2       2003-T3              6.957143                 6.891304  6.633333
     3       2003-T4              7.188571                 7.317391  6.866667
     4       2004-T1              7.340000                 7.408696  6.983333
     ..          …                     …                        …         …
     64      2019-T1              7.428571                 7.339130  7.394444
     65      2019-T2              7.214286                 7.208696  7.172222
     66      2019-T3              7.240000                 7.239130  7.194444
     67      2019-T4              6.962857                 6.908696  6.883333
```

```
68       2020-T1                    6.728571                      6.565217  6.661111

LIBREG  Centre-Val-de-Loire      Corse   Grand-Est  Hauts-de-France  \
0                  7.105263   9.685714   7.103226         9.930769
1                  7.357895   9.342857   7.306452        10.084615
2                  7.373684   9.385714   7.264516         9.880769
3                  7.773684   9.500000   7.654839        10.330769
4                  7.952632   9.600000   7.880645        10.611538
..                      …         …         …               …
64                 8.621053   9.642857   7.996774        11.069231
65                 8.426316   9.128571   7.790323        10.696154
66                 8.452632   8.957143   7.861290        10.653846
67                 8.052632   8.728571   7.496774        10.280769
68                 7.684211   8.514286   7.264516         9.911538

LIBREG  Ile-de-France  Normandie  Nouvelle-Aquitaine  Occitanie  \
0            6.636842      7.705            7.487097   9.353333
1            6.963158      7.860            7.664516   9.360000
2            6.926316      7.735            7.600000   9.226667
3            7.231579      8.085            7.900000   9.583333
4            7.447368      8.265            8.038710   9.710000
..                …          …                   …          …
64           7.357895      7.965            8.164516  10.796667
65           7.152632      7.665            7.909677  10.500000
66           7.242105      7.645            7.925806  10.403333
67           6.947368      7.385            7.574194   9.993333
68           6.794737      7.150            7.293548   9.603333

LIBREG  Pays de la Loire  Provence-Alpes-Côte d'Azur  interrégional
0               6.194737                    9.400000       7.055556
1               6.331579                    9.488235       7.222222
2               6.278947                    9.241176       7.144444
3               6.605263                    9.464706       7.500000
4               6.736842                    9.535294       7.655556
..                    …                           …              …
64              7.031579                   10.029412       8.188889
65              6.863158                    9.705882       7.966667
66              6.952632                    9.600000       8.011111
67              6.763158                    9.182353       7.733333
68              6.563158                    8.864706       7.422222

[69 rows x 15 columns]
```
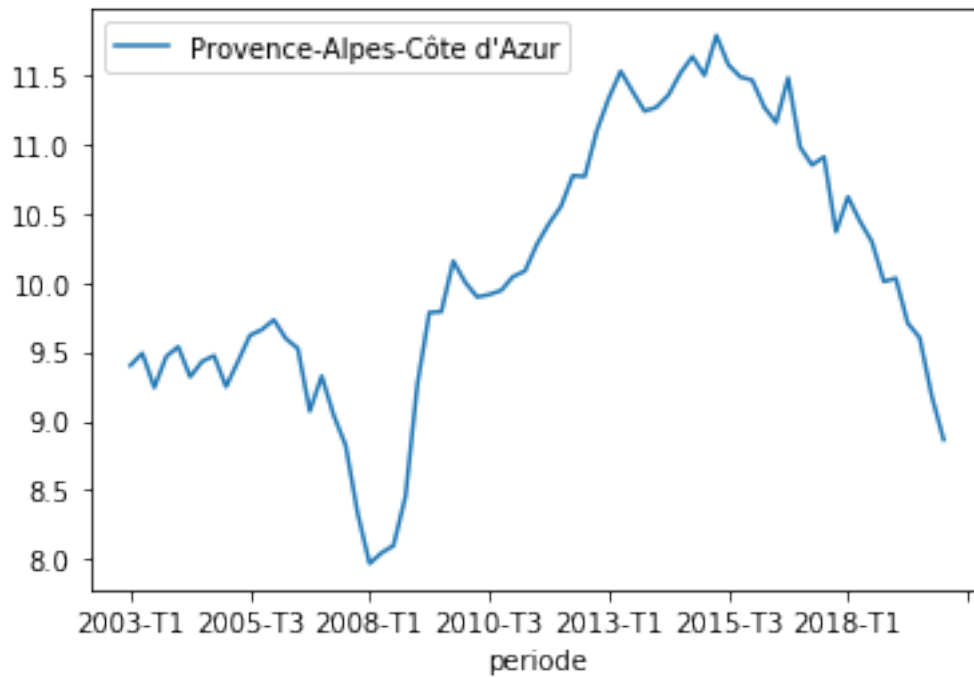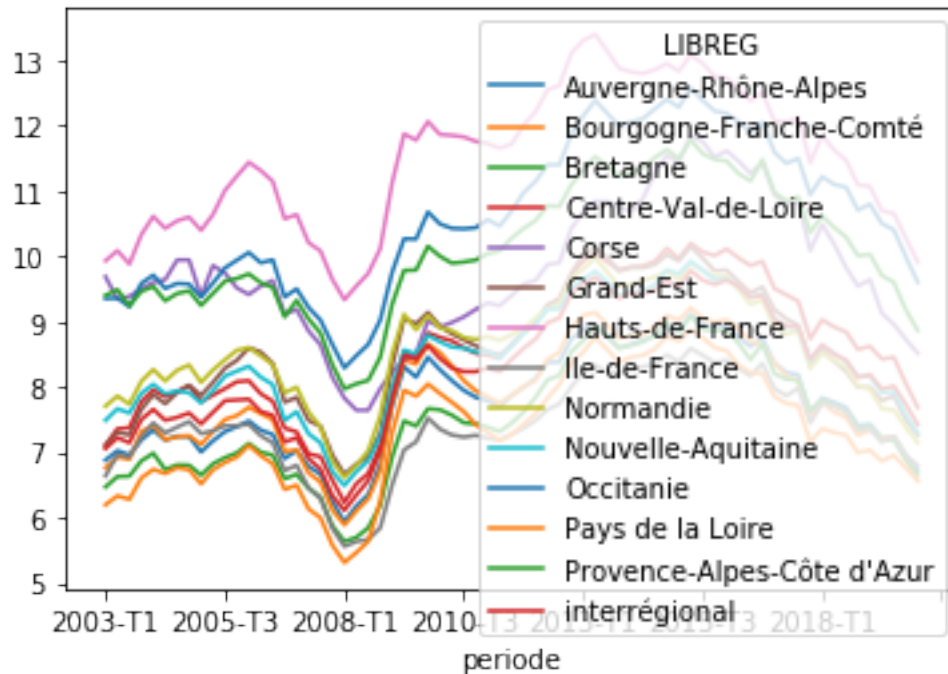
```python
[11]: data_trans = data_trans.rename(columns ={'index' : 'periode'})
      data_trans
```

```
[11]: LIBREG   periode  Auvergne-Rhône-Alpes  Bourgogne-Franche-Comté  Bretagne  \
      0        2003-T1              6.877143                 6.760870  6.466667
      1        2003-T2              7.022857                 6.926087  6.627778
      2        2003-T3              6.957143                 6.891304  6.633333
      3        2003-T4              7.188571                 7.317391  6.866667
      4        2004-T1              7.340000                 7.408696  6.983333
      ..           …                     …                        …        …
      64       2019-T1              7.428571                 7.339130  7.394444
      65       2019-T2              7.214286                 7.208696  7.172222
      66       2019-T3              7.240000                 7.239130  7.194444
      67       2019-T4              6.962857                 6.908696  6.883333
      68       2020-T1              6.728571                 6.565217  6.661111

      LIBREG  Centre-Val-de-Loire      Corse  Grand-Est  Hauts-de-France  \
      0                  7.105263   9.685714   7.103226         9.930769
      1                  7.357895   9.342857   7.306452        10.084615
      2                  7.373684   9.385714   7.264516         9.880769
      3                  7.773684   9.500000   7.654839        10.330769
      4                  7.952632   9.600000   7.880645        10.611538
      ..                       …          …          …                …
      64                 8.621053   9.642857   7.996774        11.069231
      65                 8.426316   9.128571   7.790323        10.696154
      66                 8.452632   8.957143   7.861290        10.653846
      67                 8.052632   8.728571   7.496774        10.280769
      68                 7.684211   8.514286   7.264516         9.911538

      LIBREG  Ile-de-France  Normandie  Nouvelle-Aquitaine  Occitanie  \
      0            6.636842      7.705            7.487097   9.353333
      1            6.963158      7.860            7.664516   9.360000
      2            6.926316      7.735            7.600000   9.226667
      3            7.231579      8.085            7.900000   9.583333
      4            7.447368      8.265            8.038710   9.710000
      ..                 …          …                   …          …
      64           7.357895      7.965            8.164516  10.796667
      65           7.152632      7.665            7.909677  10.500000
      66           7.242105      7.645            7.925806  10.403333
      67           6.947368      7.385            7.574194   9.993333
      68           6.794737      7.150            7.293548   9.603333

      LIBREG  Pays de la Loire  Provence-Alpes-Côte d'Azur  interrégional
      0               6.194737                    9.400000       7.055556
      1               6.331579                    9.488235       7.222222
      2               6.278947                    9.241176       7.144444
      3               6.605263                    9.464706       7.500000
      4               6.736842                    9.535294       7.655556
      ..                     …                           …              …
      64              7.031579                   10.029412       8.188889
```

65	6.863158	9.705882	7.966667
66	6.952632	9.600000	8.011111
67	6.763158	9.182353	7.733333
68	6.563158	8.864706	7.422222

[69 rows x 15 columns]

```
[13]: data_trans.plot(x = 'periode', y = "Provence-Alpes-Côte d'Azur")
```

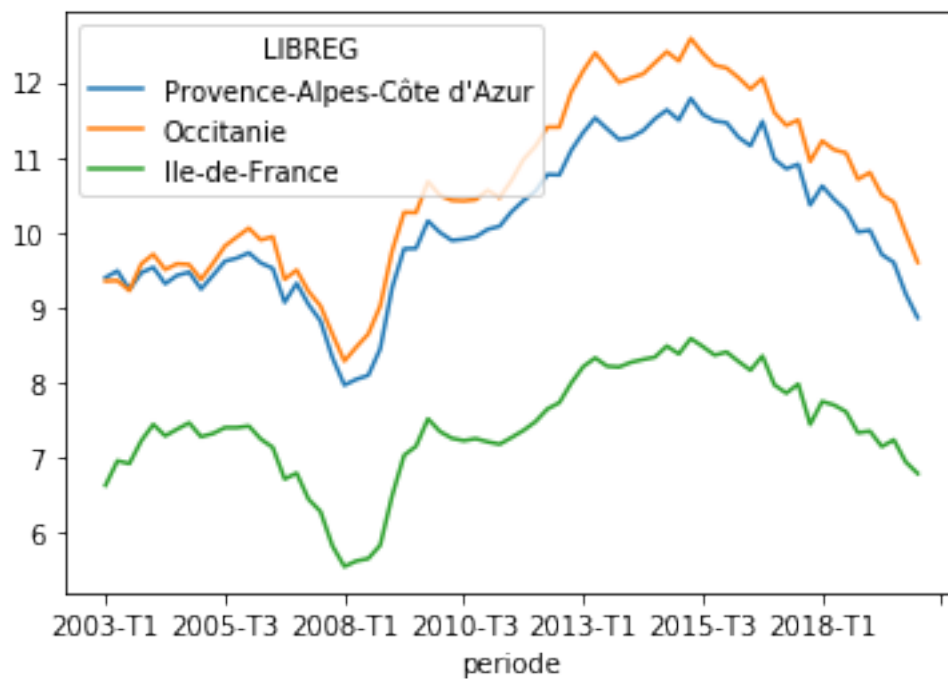[13]: <matplotlib.axes._subplots.AxesSubplot at 0x7fa411d96d10>


```
[14]: data_trans.plot(x = 'periode')
```

[14]: <matplotlib.axes._subplots.AxesSubplot at 0x7fa411a4c610>

```
[15]: data_trans.plot(x = 'periode', y = ["Provence-Alpes-Côte d'Azur", "Occitanie",
      →"Ile-de-France"])
```

```
[15]: <matplotlib.axes._subplots.AxesSubplot at 0x7fa411938b50>
```

[ ]: