green_paper

Krisna Gupta

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0.1 Introduction

Some shit from Sabzevar et al. (2017) and He, Dou, and Zhang (2017) on calculation of cap n trade.

0.2 Literature Review

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0.3 Method

Model is something like this

```
import pandas as pd
import numpy as np
from scipy.optimize import linprog

# Construct parameters
c_ex1 = np.array([3, 4])

# Inequality constraints
A_ex1 = np.array([[2, 5],
                  [4, 2]])
b_ex1 = np.array([30,20])

# Solve the problem
# we put a negative sign on the objective as linprog does minimization
res_ex1 = linprog(-c_ex1, A_ub=A_ex1, b_ub=b_ex1)

res_ex1
```

```
        message: Optimization terminated successfully. (HiGHS Status 7: Optimal)
        success: True
         status: 0
            fun: -27.5
              x: [ 2.500e+00  5.000e+00]
            nit: 2
          lower:  residual: [ 2.500e+00  5.000e+00]
                 marginals: [ 0.000e+00  0.000e+00]
          upper:  residual: [       inf        inf]
                 marginals: [ 0.000e+00  0.000e+00]
          eqlin:  residual: []
                 marginals: []
        ineqlin:  residual: [ 0.000e+00  0.000e+00]
                 marginals: [-6.250e-01 -4.375e-01]
 mip_node_count: 0
 mip_dual_bound: 0.0
        mip_gap: 0.0
```

You can add options to executable code like this

```
#| echo: false
2 * 2
```

The `echo: false` option disables the printing of code (only output is displayed).

Bibliography

He, Ping, Guowei Dou, and Wei Zhang. 2017. "Optimal Production Planning and Cap Setting Under Cap-and-Trade Regulation." Journal Article. *The Journal of the Operational Research Society* 68 (9): 1094–1105. https://doi.org/https://doi.org/10.1057/s41274-016-0123-1.

Sabzevar, Nikoo, S. T. Enns, Joule Bergerson, and Janne Kettunen. 2017. "Modeling Competitive Firms' Performance Under Price-Sensitive Demand and Cap-and-Trade Emissions Constraints." Journal Article. *International Journal of Production Economics* 184: 193–209. https://doi.org/https://doi.org/10.1016/j.ijpe.2016.10.024.