Is the Green Transition Inflationary?

Del Negro, di Giovanni, and Dogra

Discussion by Sewon Hur (FRB Dallas)

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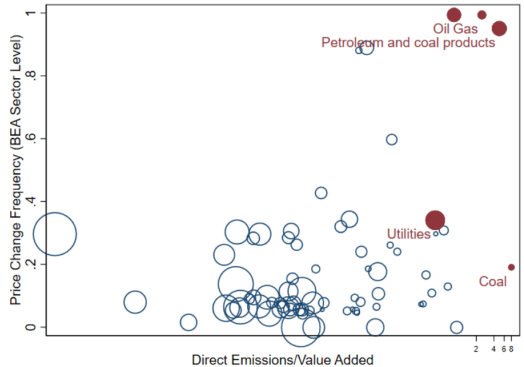
Introduction

- Are carbon taxes are inflationary?
- Provides analytical insights using a simple model to show that the answer crucially depends on
  - relative price stickiness of energy and non-energy sectors
  - importance of energy sectors in the production network
- Really nice paper!

Main contributions

- Empirically document that dirty sectors are relatively more price-flexible (this turns out to be an important fact)
- Using a simple model, provide analytical characterizations and intuition about how carbon taxes can impact the inflation-output tradeoff
- Quantify these tradeoffs in a quantitative model with a rich input-output network.

Carbon intensive sectors have higher price flexibility



A couple questions/comments:

1. Degree of price stickiness depends also on the need to adjust prices (changes in input costs, demand)
2. Some non-energy sectors have high emissions (agriculture, transportation?)

Main insights from simple model

- Using a simple two-sector (dirty and other) NK model, the authors show:
  - If dirty prices are flexible and other prices are sticky, then an increase in the relative price of dirty goods (this is the objective of a carbon tax) necessarily leads to inflation and/or a recession.
  - This is because, in order for the increase in relative prices to not be inflationary, 'other' sector prices should decline. But because this sector has sticky prices, the only way to achieve this is by engineering a negative output gap.
  - In the special case where both sectors are equally sticky, dirty price increase is exactly offset by other price decrease. Hence there is no inflation-output tradeoff!
  - In the empirically relevant case where the dirty sector is more flexible, carbon taxes introduce an inflation-output tradeoff.

Quantitative model

- Rich input-output production network (73 sectors)
- Sector-specific nominal rigidities
  - energy is generally more flexible than non-energy, as in the data
- Main results: carbon tax is inflationary
  - If monetary policy focuses on closing the output gap, core inflation is $>$50bp above target for 10 years
  - The production network is crucial. For core inflation, the network accounts for two-thirds of the impact.

Main comments/suggestions

- This is a really well-written paper with lots of new insights.
- One suggestion:
  - I think it would be really interesting to study a combination of carbon tax and clean subsidies.
  - For instance, in the simple model, the tax is modeled as a wedge, equivalent to a dirty-sector-specific markup shock.
  - In the quantitative model, I think the tax revenue is being rebated lumpsum.
  - In the flexible-price equilibrium, these might all be equivalent.
  - With nominal rigidities, however, I think that a dirty tax combined with a clean subsidy can also help with the inflation tradeoff.

Carbon tax which finances clean subsidy

- Carbon tax can be inflationary because it increases the cost of (dirty) energy, an important input for many sectors.
- Instead, if the carbon tax revenue can be used to subsidize clean energy, this effect may be dampened.
- A useful extension of the model could be incorporating clean and dirty energy: tax dirty energy but subsidize clean energy.
- Within the current model, one could tax energy and subsidize non-energy, but the substitutability for green and dirty energy may be higher (than that for energy and non-energy).
- Authors show that subsidizing other sector can be disinflationary. So, it may require a balancing act, but this paper could quantify the optimal mix.

Rationale for dirty tax/clean subsidy

- In recent work (Belfiori et al. 2025), we show that the constrained-efficient allocation in a heterogeneous-agent climate economy can be decentralized with
  - a dirty tax
  - a clean subsidy
  - a lumpsum transfer (if household preferences are non-homothetic)

Corollary 1 (Uniform Carbon Tax, Clean Subsidy, and Transfer) *Suppose that the allocation* $\{c_{dt}^i, c_{ct}^i, S_t\}_{t=0,\forall i}^{\infty}$ *solves the constrained-efficient planner's problem with the additional constraint* (32)*. Then, the constrained-efficient allocation* $\{c_{dt}^i, c_{ct}^i, S_t\}_{t=0,\forall i}^{\infty}$ *is also implementable as a competitive equilibrium with an all-uniform climate policy* $\{\tau_{dt}, \tau_{ct}, T_t\}$ *given by:*

$$\tau_{dt} = \gamma\tau_t \quad ; \quad \tau_{ct} = (1-\gamma)\frac{\tau_t}{1+\tau_t} \quad ; \quad T_t = \tau_{ct}\bar{c} \tag{36}$$

where τ_t *is given by* (33) *from Proposition 2.*

One more suggestion

- The model can also be used to study the inflationary implications of tariffs.
- Same model, same production network, but instead of a carbon tax, impose tariffs.
- Are sectors more exposed to import tariffs more or less price flexible? How important are they in the production network?
- Some import tariff exposed sectors are price-flexible (agriculture, mining, utilities, transportation) and others are more rigid (nondurable and durable manufacturing)
- Whether tariffs are inflationary and to what extent is a quantitative question that can be answered with this model.

Concluding remarks

- Great thought-provoking paper, with lots of new insights. Learned a lot!
- Looking forward to the next iteration, hopefully with a quantitative exploration of dirty taxes and clean subsidies.