Discussion

Defining the Abatement Cost in Presence of Learning-by-doing: Application to the Fuel Cell Electric Vehicle

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Summary of the paper

Aim: Dynamical analysis of MAC.

Dynamic one sector model with

- Two varieties (cars) produced with two different technologies: old and dirty vs green and clean,
- Abatement $\equiv$ Production of the green substitute,
- Learning-by-doing in the production of the green good: stock of knowledge decreases the – convex – cost of production of that good (cost of abatement).

Analysis: First, optimal abatement policy

1. Launching date of the production of clean cars,
2. Path of production of clean cars (in substitution for dirty ones) during the deployment phase,
3. Duration of the deployment phase,
4. Overall production of green cars during deployment.

Summary cont'd

Then, second best perspective:

- Inefficiency along one of these dimensions,
- Impact on the launching time.

Finally, application to the german car sector:

- Normative current price of carbon that would trigger the deployment of electric cars today,
- Changes in the parameters (policy instruments) to make this price equal to the actual estimate.

Contribution:

- Expression of the dynamic MAC from the optimality conditions defining abatement,
- Optimality condition for the launching time: carbon price equals the abatement cost of the whole project,
- Price of carbon is larger than actual estimate.

Comments and Questions

Very interesting paper, well done!

Assumptions about learning-by-doing

- Only source of technical change: What about R&D, technology diffusion? What's the most important? Do you keep track of the other sources in the data?
- The clean production only benefits from learning by doing: data, literature (Acemoglu et al. 2012).

Optimal trajectory:

- Reduced form problem: planner takes the social value of carbon as given.
- Equivalent to the solution of the problem including the dynamics of pollution and a cap on GHG concentration?
- Is this section really useful? Optimality conditions defined by (10), (13), (14) and $I^*(\overline{X}, D)$ with the *deployment scenario* approach, right?

Comments and Questions (cont'd)

Second best:

- Decisions made by the decentralized economy.
- Why should firms use the same discount rate as the planner? Generalization.

Comparative statics:

- As long as one of the conditions above not satisfied, it affects all of the other decisions,
- Unclear to me how the whole adjustment works: Discussion deserves more then 2 graphs.

Comments and Questions (last)

Calibration exercise:

- Deployment period limited to 35 years (2015-2050): why? (data availability, projections)
- No full replacement of combustion engine cars: quite small share of the total fleet,
- Convergence of costs in 2050, non constant fleet, non constant cost of production of "old" cars etc.

Isn't the absence of other sources of technological change (R&D in battery technology) a limit?

May increase both the deployment period and the share of electric cars in the fleet.

Very different from the theory:

- Is it really consistent with the theory developed?
- Is the optimal rule for the launching date used a good approximation for the numerical analysis?