Green Industrial Policies: Trade and Public Policy

Larry Karp Megan Stevenson

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Industrial policy (IP): an old debate

- Green industrial policy (GIP) is the use of industrial policy to promote environmental objectives, e.g. the switch to low-carbon fuels.
- Disagreements about industrial policy (IP) have been around for a long time.
- Pro IP: a means of addressing market failures.
- Con IP: governments can't identify winners and are prey to rent seeking.
- Empirical evidence largely based on case studies, inconclusive.

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  - What was its opportunity cost? What is its environmental cost?
- Example: German solar policy.

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- Example: German solar policy.
  - What was its contribution to reducing cost of solar? How valuable will the alternative source of energy be to Germany?

Objectives of this paper

1. Relate Green Industrial Policy (GIP) both to other forms of environmental policy and to Industrial Policy (IP) writ large.
2. Illustrate trade conflicts arising from GIP.
3. Apply lessons from the theory of public policy to GIP.
4. (Provide a partial summary of current GIPs – not covered in this talk).

What makes GIP different from IP?

- Ultimate test of IP (e.g. future profitability of steel sector) is market-driven; govt does not determine market conditions once IP ceases.
- In contrast, future profitability of green sector closely tied to *future* govt policy (e.g. future carbon tax); future govt policy determines size of future market.
    - Current govt can't commit to future policy; future policy responds to future circumstances.

- Future govt policy is endogenous: e.g. investment in low carbon power source reduces future social cost of abatement.

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  - Examples of policy changes/risk: Brazil with ethanol; US with wind and solar subsidies; California (almost) with AB32.
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- Future govt policy is endogenous: e.g. investment in low carbon power source reduces future social cost of abatement.
  - GIP provides a way for current govt to influence future policy.

Broad-based environmental policy versus GIP

- An important advantage of broad-based policies (e.g. carbon tax): they do not try to pick winners.
- A disadvantage of these policies: they affect flow of profits chiefly *while they are in effect* but not after they cease.
  - (Although they may long run effects, e.g. learning by doing.)
- Investment decisions depend on anticipated *future* profits.
- The advantage of GIP: they target investment directly and thus influence the future directly.
- The disadvantage of GIP: they do require picking winners

Trade issues: US-Brazil

- US imposed tariff to avoid paying its ethanol subsidy (VEETC) to Brazil's ethanol producers.
- WTO rule (National treatment of like products) + special status of agricultural products "created" tariff.
- Past Brazilian ethanol subsidies used to justify current US policy.
- VEETC and tariff have ended, US ethanol sector looking for different forms of subsidy.

Renewable Fuels Association: "We are not seeking an extension of the ethanol blenders tax incentive. The industry is moving on. VEETC did what subsidies are supposed to do: help build an industry, ensure that it is stable and successful, and then fade away."

Trade issues: China versus US and Europe

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  - Those policies might impede development of Western green sector, an important political constituency for future green policies.
    - But they promote the development of that constituency in China.
  - Perhaps positive externalities (different sources of IRTS) will be greater if there is a strong green sector in several countries (rather than only in China).

Lessons from the theory of public policy

- In this talk:

1. The Green Paradox and GIP.
2. The effect of GIP on the incentives to participate in a climate agreement.

- In the paper but not the talk:

1. The role of GIP under asymmetric information between firms and regulator.
2. The role of GIP in resolving policy-induced coordination failures.

The Green Paradox and GIP

- GIP lowers future cost of carbon substitutes, lowering the *future* demand for and price of carbon-based fuel.
- GIP induces resource owners to shift future sales into current period.
- (More technically: GIP lowers current "scarcity rent" for these fuels, shifting out their current supply function and increasing current sales = consumption.)
- If marginal damage is increasing, GIP increases the current optimal tax.
- Therefore, GIP makes current regulation more important, not less important. (GIP and current carbon regulations are *complements, not substitutes.)*

Criticisms of this application of Green Paradox.

- (A technical issue regarding assumption of increasing marginal damages. Paper explains why this criticism is probably not important.)
- Application here (like most versions of Green Paradox), assumes that potential supply of carbon fuels is exogenous.
- In fact, "potential supply" depends on exploration and development of new fields (e.g. Canada' tar sands, Brazil's offshore oil).
- GIP can influence decisions to make these kinds of investment, reducing "potential supply" of carbon fuels.

GIP and the incentives to participate in climate agreements

- GIP lowers abatement costs.
- Previous results suggest that lower abatement costs reduce incentives to participate in climate agreement.
  - With lower costs, fewer members are needed to make the costs of emissions reductions worthwhile (for members).
- This familiar result is based on parametric examples, and is not robust.

A more general example

- There are three ways to reduce emissions due to electricity generation.
  - Coal results in one unit of emissions per unit of electricity.
- The marginal damage of emissions is constant
- Green industrial policy might lower g and/or s and increase x.
- Many possibilities in this model, including the "standard" result and the opposite of that result – depends sensitively on the magnitudes of g,x, and s.
- Distrust the folk-wisdom that claims that lower abatement costs reduce participation incentives.

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  - Maximum feasible abatement requires converting to 100% solar.
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GIP and asymmetric information about costs

- Importance of GIP may depend on type of regulation of carbon emissions (tax or cap and trade, here)
- (i) Government chooses level of policy (tax or cap), (ii) firms make investment that lowers their future abatement costs (iii) nature reveals shock (e.g. an input price) that affects abatement costs (iv) firms choose emissions level.
- If govt uses the cap, firms' investment decisions are information-constrained optimal; the addition of an investment subsidy/tax (GIP) does not help: the optimal investment tax/subsidy is 0.
- If govt uses the emissions tax, firms' investment decisions are not information-constrained optimal.
    - Optimal GIP may be an investment tax rather than subsidy.

Policy-induced coordination failure and GIP

- A second-best emissions policy can create a coordination failure, which GIP can ameliorate.
  - (i) nonstrategic firms make lumpy investment decisions (e.g. installation of low-carbon technology)

- Cap without trade renders investment stage a coordination game, with multiple equilibria.

- GIP can be used to induce firms to coordinate on the second best equilibrium when govt uses cap without trade.

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  - (ii) govt observes fraction of firms that made the investment and chooses a emissions cap (a standard) – the same for each firm – without allowing emissions trade (cap without trade).
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- Cap without trade renders investment stage a coordination game, with multiple equilibria.
  - In contrast, there is unique equilibrium (first best) to investment stage if govt uses cap and trade.
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  - In contrast, there is unique equilibrium (first best) to investment stage if govt uses cap and trade.
- GIP can be used to induce firms to coordinate on the second best equilibrium when govt uses cap without trade.
  - But GIP may be an investment tax rather than subsidy.