Externalities and Industrial Policy

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Externalities

- In our discussion of misallocation, the wedges τ are a distortion that drives a gap between marginal products. The goal is $\tau \to 0$.

- What about the cases where the market naturally creates a wedge between private marginal products and social marginal products?

- Aggregate output is not the same as aggregate welfare...

- Externalities are key to this conceptualization.

$$SMPX_i = MPX_i + \underbrace{\varepsilon_i}_{\text{externality}}$$

Types of Externalities

- Positive externalities:

    - Knowledge spillovers

    - Agglomeration

- Negative externalities

    - Pollution

Industrial Policy

- A deliberate attempt to shape the structure and composition of the economy.

- Implies that the market is not allocating resources efficiently, i.e., that we could increase aggregate welfare by moving factors/inputs around.

  - In the absence of market failures, inputs are already pareto-efficiently allocated.

  - Best policy is no policy.

  - Boskin (1992) "It doesn't make any difference whether a country makes computer chips or potato chips. $100 of one, or $100 of the other; it's still $100."

Industrial Policy

$$SMPX_1 > SMPX_2$$

- market failures in 1 are worse than 2

- We can raise welfare by moving resources from 2 to 1.

- Industrial policy is a corrective policy for addressing market failures.

- Seems reasonable to think that market failures exist.

- More challenging is where they are relatively worse.

- We need a differential SMPX to justify industrial policy.

Good Industrial Policy

- Optimal Industrial Policy is all about the externalities.

- Pigou (1920) argued that the optimal tax or subsidy shoudl be equal to the marginal external cost/benefit.

- Doesn't have to literally be a tax/subsidy.

    - Second-best policies may still move "X" closer to the target.

- Traditional Pigouvian policies don't solve coordination problems — problematic in the presence of mulitple equilibria (strategic complementarities, path dependence, etc.)

- Sturm (2023) shows that "super-pigouvian" policies can solve coordination problems, by rewarding behavior that triggers large shifts in aggregate behavior.

What isn't good Industrial Policy?

- Optimal Industrial Policy has nothing to with a targeted activity's:

  - Position in the value chain/network

  - TFP, Size, Status, etc.

  - Growth prospects or history

  - Trade status

- It's all about the externalities.

  - The first-order gain is $SMPX_1 - SMPX_2$, not ΔX.

  - We may not see TFP effects.

  - Again... Aggregate output is not the same as aggregate welfare!

- Solyndra went bankrupt, but was it bad industrial policy? Depends on whether it produced big externalities or not.

A Broader Definition

Juhasz, Lane, and Rodrik (2023) "The New Economics of Industrial Policy"

"We define industrial policies as those government policies that explicitly target the transformation of the structure of economic activity in the pursuit of some public goal. The goal is typically to stimulate innovation, productivity, and economics growht. . . .

Our definition is open-ended and includes support for services as well as particular types of R&D.

Hence industrial policies overlap with what in other contexts might be called regional policies (Slatery & Zidar, 2020), place-based policies (Neumark & Simpson, 2015), or innovation policies (Mazzucato, 2014)

In developing countries, industrial policies are often called productive developemnt policies or structural transformation policies."

Do favored industries/firms/regions grow faster?

- It depends.

- The ex-ante expectation is "yes, of course!"

    - But maybe that growth was inevitable. Need to find a credible counterfactual for policy "winners".

    - Growth may not self-sustain beyond policy term.

- Government may no tbe good at "picking winners"

- Policy may target sunset industries, at risk of capture and rent-seeking — "last gasp technologies" (Snow, 2004).

- Policy may be poorly designed or implemented (Barwick et al., (2024)).

- Weak institutions may not be able to prevent or detect abuses.

Place-based: "Some Causal EFfects of an Industrial Policy" (Criscuolo et al., 2019)

- Investment subsidies given to firms in areas that would otherwise have performed badly.

- Exploits exogenous variation in eligible areas in 2000 using 1997–2004 data

- Eligible areas experienced increased manufacturing employment.

- Increases driven by smaller firms.

- Money given to larger firms had zero effect.

  - Perhaps large firms were able to game the system

  - Grants appeared to remove financial constraints only faced by smaller firms.

Place-based: "Local Economic Development, Agglomeration Economies, and the Big Push: 100 Years of Evidence from the Tennessee Valley Authority" (Kline and Moretti, 2014)

- Use authorities that were proposed but never approved by Congress.

- TVA generated gains in both agricultural and manufacturing employment

- After TVA transfers lapsed, gains in agriculturral employment completely reversed, but gains in manufacturing continued to intensify.

Industry-based: "Manufacturing Revolutions: Industrial Policy and Industrialization in South Korea" Lane (2023)

- Studies South Korea's heavy and chemical industry (HCI) drive (1973–1979)

- Evidence of direct positive effects on targeted vs. non-targeted industries + downstream effects.

- Both effects persisted after the policy ended in 1979.
- Effectiveness reliant on political circumstances and government capacity.

Industry-based: "Industrial Policies in Production Networks" (Liu, 2019)

- Market imperfections (e.g., financial frictions) compound through backward linkages, making upstream sectors the "sink" for distortions.

- "Distortion Centrality" (Influence/Domar weight) is a sufficient statistic for the social value of subsidies.

- Empirically, production networks are "hierarchical," meaning upstream sectors consistently have high distortion centrality.

- South Korea's HCI drive and modern Chinese interventions targeted these upstream sectors.

- Estimates suggest these interventions improved aggregate efficiency by $\approx 6.7\%$ in China.

Green Industrial Policy?

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Green Industrial Policy?

- What is different about Green Industrial Policy?
  - Given industrial mix, make folks greener.
  - Change industry mix to be greener.
  - Support green technologies.
  - Encourage firm upgrading.
  - Reduce barriers to technology adoption.

- Estimating environmental externalities may be easier than other distortions/externalities.

- But addressing pure environmental externalities is better done with taxes that make emissions more expensive, and may still induce directed technical change (Acemoglu et al., 2012).

- For green industrial policy focused on developing novel products and technologies when there are knowledge externalities = regular industrial policy (conditional on correct carbon price).

- But, with green IP, subsidies act as a countervailing force against free riding.

Green Industrial Policy: "Ray of Hope: China and the Rise of Solar Energy" (Banares-Sanchez et al., 2025)

- Industrial policy supporting clean technologies has the potential to reduce emissions, without compromising growth, and deliver global benefits even when implemented by a single country.

- Between 2004 and 2013, Chinese solar production grew by 76% per year.

- Prices fell by 91% between 2004 and 2019 and installed capacity increased 173-fold.

- Meteoric rise accompanied by a wave of place-based subsidies.

- Production and innovation subsidies generated large and persistent increases in local innovation, firm numbers, output, and exports.

- Policy explains 40% of the global price decline.

- Increased Chinese welfare by 1–2.3% (almost as muhc as existing estimates of WTO Accession).

- Innovation subsidies were by far the most cost-effective.