



Comments on “The Effect of China’s Tax Policies
Supporting Hi-tech Industry Development”
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These comments are solely those of the presenter. They are not meant to represent the views of the U.S. International Trade Commission or any of its Commissioners.



Question:

- How do tax preferences affect productivity in high-technology industries?
- Such policies have existed in China since at least the early 1990s, and have changed from time to time.



Framework: Corporate taxation and productivity

- Effective tax rates →
- After-tax profits (return on capital) →
- Investment in newer capital equipment, R&D, other knowledge-seeking activities (licensing, consultancies, mergers and acquisitions, investments in human capital) →
- Innovation:
 - Increases in productivity of process technology
 - New products
- There are multiple factors at work in each step of the chain. It is hard to make inferences directly from effective tax rates to productivity. Analyze intermediate steps. An analysis where effective tax rates → productivity is hard to interpret.
- Even if we can make such inferences, they should be about the *level* of tax rates, not interindustry *differences*, because other things differ at each stage as well



Technological opportunity and appropriability

(Levin et al. 1987; Klevorick et al. 1995)

- The rate of innovation is influenced by
 - Technological *opportunity*: Is there something out there to invent? (Influenced by history of previous progress, developments in science, etc).
 - Technological *appropriability*: Can the innovator profit by innovating?
 - Appropriability can be influenced by taxation (also by degree of competition, IPR, etc.), *but*
 - The industries benefiting from China's tax policies were not chosen randomly, and probably also had high technological opportunity
 - Thus, causation is difficult to infer



Productivity measurement

- Single-factor productivity (defining OUTPUT as Q)
 - (Q/L) , (Q/K) , (Q/land) , (Q/energy) , etc.
- One can imagine Q/M (productivity of bundle of intermediate inputs), but it is unusual, and moreover would require prices for Q and M to express in real terms
- The authors propose $VAD_RATE = VAD/Q$ as a productivity measure. Since, in value terms, $Q = VAD + M$, this is similar to measuring the productivity of intermediates
- Measuring productivity increases in processing does not capture innovation equally for all sectors (in U.S. data productivity in pharmaceuticals is declining slightly, but this reflects manufacture of pills, not value of better, more innovative pills)
- The regression estimated in Table 2 is essentially testing the hypothesis that multi-factor productivity is correlated with changes in tax rates under the assumption of no changes in relative prices.
- Use a simpler productivity measure (or construct TFP by index numbers), get prices of Q , K , M to express in real terms, and analyze changes with respect to actual tax levels.
- A multi-stage analysis would be even better.