

Optimal Taxation of Multinational Enterprises: A Ramsey Approach

by Dyrda, Hong, and Steinberg

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Motivation

1. Important and topical question: Any role for international tax coordination? How should the international tax system be designed?
2. Contribute to current debate on profit shifting by multinationals and tax reform proposals (2017 TCJA, global tax deal)

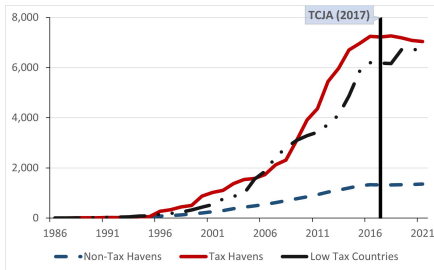
Guvenen et al. (2022), Clausing (2022), Dyrda, Hong, and Steinberg (2022), Santacreu (2023), Torslov et al. (2023)

3. Main channel for profit shifting is through changes in IP ownership, which is reflected in licensing data
 - ▶ US MN transfers patent ownership to affiliate in Bermuda ⇒ Bermuda receives large amount of royalty payments
 - ▶ Would-be US tax revenues stay in Bermuda
 - ▶ Profits stay in Bermuda (?)

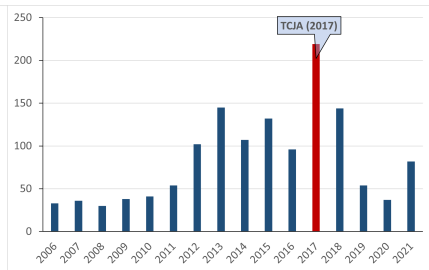
Empirical Evidence: Profit Shifting through IP and the Role of Taxation (LaBelle and Santacreu, 2023)

1. Rise in transfer of patent ownership to TH after 2000
2. IP transfers stalled after 2017 GILTI tax during the TCJA reform
3. IP returned to the US from overseas in 2017

Patent sales by US companies



US imports of IP



Source: KtMine and BEA

Low-tax Countries: Belgium, Ireland, Hong Kong, the Netherlands, Singapore, and Switzerland (DHS); **Tax havens:** Torslov et al (2023)

The Approach

1. Theory: Extend Chari, Nicolini, and Teles (2023) to MN production and intangible investment
 - ▶ If only MN production and intangibles (no externality) \Rightarrow Optimal corporate tax is zero even and profit shifting is irrelevant
 - ▶ Add knowledge spillovers (externality) \Rightarrow Role for optimal corporate taxes **only** when there is profit shifting
 - ▶ **New and more exciting theoretical results**
2. Quantitative Analysis:
 - ▶ Calibrate economy as in DHS but with spillovers
 - ▶ Solve constrained and unconstrained global Ramsey problem focusing on long-run steady state
3. My comments:
 - ▶ Understanding the externality
 - ▶ More work linking theory and quantitative analysis and unpacking the results

Theory: Chari, Nicolini, and Teles (2023)

How should governments coordinate to set fiscal and trade policies? Start from BKK with distortionary taxes...

Pareto Frontier

1. No labor wedge

$$-\frac{u_{ct}^i}{u_{nt}^i} = \frac{1}{G_{it}^i F_{nt}^i}$$

2. No investment wedge

$$\frac{u_{ct}^i}{\beta u_{c,t+1}^i} = G_{i,t+1}^i F_{k,t+1}^i + 1 - \delta$$

3. Static production efficiency

$$\frac{G_{jt}^i}{G_{it}^j} \text{ same } \forall i$$

4. Dynamic production efficiency

$$\frac{G_{jt}^i}{G_{j,t+1}^j} [G_{i,t+1}^j F_{k,t+1}^j + 1 - \delta] \text{ same } \forall i$$

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Competitive equilibrium

1. No labor wedge

$$-\frac{u_{ct}^i}{u_{nt}^i} = \frac{(1+\tau_{it}^c)}{(1-\tau_{it}^n)G_{it}^i F_{nt}^i}$$

2. No investment wedge

$$\frac{u_{ct}^i}{\beta u_{c,t+1}^i} = \frac{1+\tau_{it}^c}{1+\tau_{c,t+1}^i} G_{i,t+1}^i F_{k,t+1}^i + 1 - \delta$$

3. Static production efficiency

$$\frac{(1-\tau_{jt}^x)(1+\tau_{lt}^m)}{(1+\tau_{jt}^m)(1-\tau_{lt}^x)} \frac{G_{jt}^i}{G_{lt}^i} \text{ same } \forall i$$

4. Dynamic production efficiency

$$\frac{(1+\tau_{j,t+1}^m)(1-\tau_{jt}^x)G_{jt}^i}{(1-\tau_{j,t+1}^x)(1+\tau_{jt}^m)G_{j,t+1}^i} [G_{i,t+1}^i F_{k,t+1}^i + 1 - \delta] \text{ same } \forall i$$

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$$\frac{(1+\tau_{j,t+1}^m)(1-\tau_{jit}^x)}{(1-\tau_{j,t+1}^x)(1+\tau_{jit}^m)} \frac{G_{jt}^i}{G_{j,t+1}^i} [G_{i,t+1}^j F_{k,t+1}^i + 1 - \delta] \text{ same } \forall i$$

Results: Free trade is optimal, no tax harmonization, and zero labor income taxes

Theory: Introduce intangible Investment and Multinational Production (no externality)

1. Optimal intangible: Pareto Frontier

$$\frac{F_{lt}^{ii}}{F_z^{ii} H_l^i} = 1 + \underbrace{\sum_{j \neq i} \left(\frac{u_{ct}^j G_{it}^j F_z^{ijt}}{u_{ct}^i G_{it}^j F_{zt}^{ii}} \right)}_{\text{Non-rival intangible}}$$

2. In a competitive equilibrium with distortionary taxes:

$$\frac{F_{lt}^{ii}}{F_z^{ii} H_l^i} = 1 + \sum_{j \neq i} \left(\frac{u_{ct}^j G_{it}^j F_z^{ijt}}{u_{ct}^i G_{it}^j F_{zt}^{ii}} \right) \left(\frac{1 - \tau_{jt}^p}{1 - \tau_{it}^p} \frac{1 - \tau_{jit}^x}{1 + \tau_{jit}^m} \frac{G_{jt}^i}{G_{jt}^j} \frac{u_{ct}^i}{u_{ct}^j} \right)$$

3. It turns out that if there are no distortionary taxes:

$$\frac{1 - \tau_{jt}^p}{1 - \tau_{it}^p} \frac{1 - \tau_{jit}^x}{1 + \tau_{jit}^m} \frac{G_{jt}^i}{G_{jt}^j} \frac{u_{ct}^i}{u_{ct}^j} = 1$$

4. No role for corporate taxes

New version: Add an externality specific to MN production

1. Pareto frontier: optimal investment in intangible

$$\frac{F_{lt}^{ii}}{F_{zt}^{ii} H_l^i} = 1 + \underbrace{\sum_{j \neq i} \left(\frac{u_{ct}^j G_{it}^j F_{zt}^{ijt}}{u_{ct}^i G_{it}^j F_{zt}^{ii}} \right)}_{\text{Non-rival intangible}} + \underbrace{\sum_i^z}_{\text{externality}}$$

2. Many ways to introduce an externality capturing knowledge spillovers: trade, FDI, migration, international licensing, JV
3. In this paper:
 - ▶ Focus on knowledge spillovers through FDI
 - ▶ When choosing l_i^z , firms not internalize that their research efforts impact intangible decisions of other firms

$$z_i = H_i(l_i^z, \sum_{j \neq i} l_j^z)$$

New version: Add an externality intrinsic to MN production

- Comment #1:** Empirical evidence and quantitative importance of FDI generates spillovers on the host country
 - ▶ Mixed results (Alfaro et al, 2010): Spillovers or linkages (i.e., through vertical integration to prevent leakages of IP)?
 - ▶ Endogenous growth models (but in this paper intangible decision is a static problem)
- Comment #2:** While there is an externality in the model, it is not specific to multinational firms (Productivity spillovers)

$$\Sigma_i^z = \sum_{j \neq i} \left[\frac{H_{it}^j}{H_{it}^i} \left(\frac{G_{jt}^i}{G_{it}^i} \frac{F_{zt}^{jj}}{F_{zt}^{ii}} + \frac{u_{ct}^j G_{jt}^j F_{zt}^{jj}}{u_{ct}^i G_{it}^i F_{zt}^{ii}} \right) + \sum_{k \neq i, j} \frac{H_{it}^k}{H_{it}^i} \frac{u_{ct}^j G_{kt}^j F_{zt}^{kj}}{u_{it}^c G_{it}^i F_{jt}^i} \right]$$

- Comment #3:** Alternative: Productivity of firms in host country increases with intangible investment of multinationals operating there (FDI spillovers)

$$y_{ij} = A^j \left(\sum_{m=1}^M z_{mj}^{MN} \right) z_i^\psi l_{ij}^\gamma$$

Theory: Competitive equilibrium

1. In the competitive equilibrium:
 - ▶ The externality is not internalized \Rightarrow underinvestment in intangibles (in all three cases)
 - ▶ It turns out that the most interesting case is profit-shifting: The government can use **corporate taxes** to achieve the first best
2. **Comment #4:** Positive message about profit shifting (gets us closer to Pareto frontier):
 - ▶ But profit shifting could introduce additional (negative) externality
 - ▶ Example: Imitation if low enforceability in the destination, distort competition in origin (comparative disadvantage of domestic firms)
3. **Comment #5:** Any role for alternative policy instruments?
 - ▶ R&D subsidies? Patent boxes?

Quantitative Analysis

1. **Comment #6:** Calibration:

- ▶ The parameter ν , which represents the strength of the spillover, plays a crucial role in determining the quantitative relevance of policy. Currently, the value is set to $\nu = 0.05$. However, you could use estimates from the existing literature and perform robustness analysis across different values (Javorcik, 2004)
- ▶ Externality is introduced slightly differently than in the theoretical part of the paper. Why?

2. **Comment #7:** Cooperative Ramsey (constrained and unconstrained) restricting attention to the long run

- ▶ Transitions may be important and optimal policy could change once that is taken into account
- ▶ Compare to Nash equilibrium
- ▶ Political-economy considerations \Rightarrow Partial coordination (floor to corporate profit tax rates to end race-to-the-bottom)

Quantitative Analysis

1. **Comment #8:** I would focus on the profit-shifting scenario and expand it:
 - ▶ See comment # 7
 - ▶ More robustness around key model parameters: externality parameter, discount at which IP is sold abroad, ...
 - ▶ Consequences of optimal taxes for other variables of interest (intangible investment, growth, ...)
2. **Comment #9:** Results hinge on specific assumptions about profit redistribution and ownership structure
 - ▶ The value of the firm is given by global profits and intangible investments chosen to maximize these profits
 - ▶ But foreign profits that are repatriated should be taxed at domestic rate? intra-firm loans? paying out shareholders?

Additional Comments

1. Connect to Global tax deal proposed at the OECD:
 - ▶ How far is the optimal tax policy from the Global tax deal?
 - ▶ Relate to Global Tax Deal: tax on the country of sales or country of production (Pillar 1)
2. Justify separation between LT and TH? How are these two groups of countries different in the model?
3. Time-inconsistent non-cooperative solution?
4. Dynamics in intangibles (future work?)

Final Remarks

1. Very nice and interesting paper
2. Lots of mechanisms to unpack
3. Looking forward to the next version