Government Reputation, FDI, and Profit-shifting

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Research Question

- How does institutional capacity affect corporate income tax?
- Reputation: probability that the government commits to a pre-announced tax rate
- Two countervailing effects of having a good reputation:
  1. A well-reputed government can impose a high tax rate since it attracts firms' investment and enjoys a high tax base.
  2. Better reputation (higher probability of government being a credible type) amplifies the marginal distortion of raising statutory tax rate on corporate investment.
- Data shows that tax rates are lower in countries with better government reputation.
- I present a game between a government and multinational firms, and show that the model generates the empirical relationship when we incorporate firms' profit-shifting decision.

Data

- Government reputation proxied by annual investment profile risk scores from International Country Risk Guide (ICRG) by the PRS Group
  - Risk scores measured in $[0, 12]$: Convert this as Risk $= 12 -$ Risk Score
  - Reflects sources of government-related investment risks: capital expropriation, impediments to profit repatriation, payment delays, etc.
- Country-level annual FDI net inflows and real GDP from World Bank database in 2000–2021
- Statutory corporate income tax rates of the countries in 2000–2021 from Enache (2022)
- A cross-section of profit-shifting and effective tax rate estimates for 2016 by Garcia-Bernardo and Jansky (2021) based on OECD Country-by-Country Reporting (CbCR) data

Government Reputation and Corporate Income Tax

- Statutory corporate income tax rates are lower in countries with better reputation.

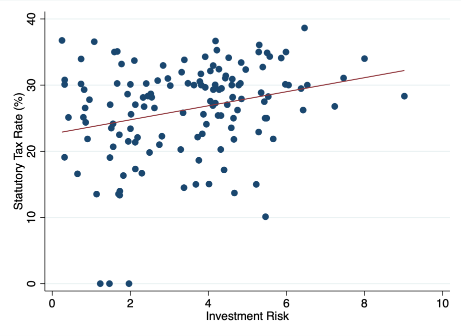


Figure 1: Statutory Tax Rate

	(1)	(2)
Risk_{t-1}	0.233*	
	(0.115)	
Standardized Risk_{t-1}		0.566**
		(0.267)
Controls	Yes	Yes
Clustered	Two-way	Two-way
N	135	135
Within R^2	0.013	0.014

Note: * and ** denote significance at 90% and 95% levels.

Table 1: Regression on Statutory Tax Rate

Government Reputation and FDI

- FDI net inflows are negatively correlated with government reputation.

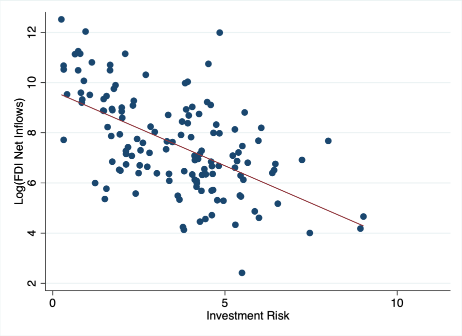


Figure 2: log(Real FDI Net Inflows)

	(1)	(2)
Risk_{t-1}	-0.052**	
	(0.020)	
$\text{Standardized Risk}_{t-1}$		-0.096**
		(0.044)
Controls	Yes	Yes
Clustered	Two-way	Two-way
N	119	119
Within R^2	0.180	0.179

Note: ** denotes significance at 95% level.

Table 2: Regression on log(FDI Net Inflows)

Government Reputation and Profit-shifting

- Multinational firms shift more profits from countries with worse government reputation because of higher tax rates.

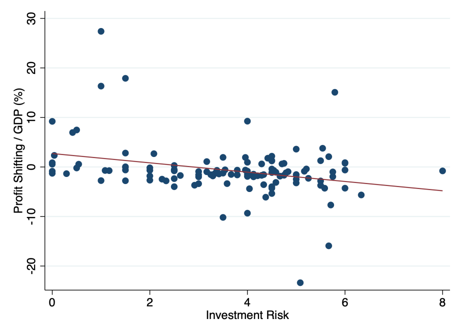


Figure 3: Profit-shifting/GDP

	PS/GDP	ETR
Risk_t	-0.740**	2.026**
	(0.348)	(0.852)
Controls	Yes	Yes
N	115	115
Adjusted R^2	0.237	0.179

Note: ** denotes significance at 95% level.

Table 3: Regression on Profit-shifting/GDP

Housekeeping the Empirical Facts

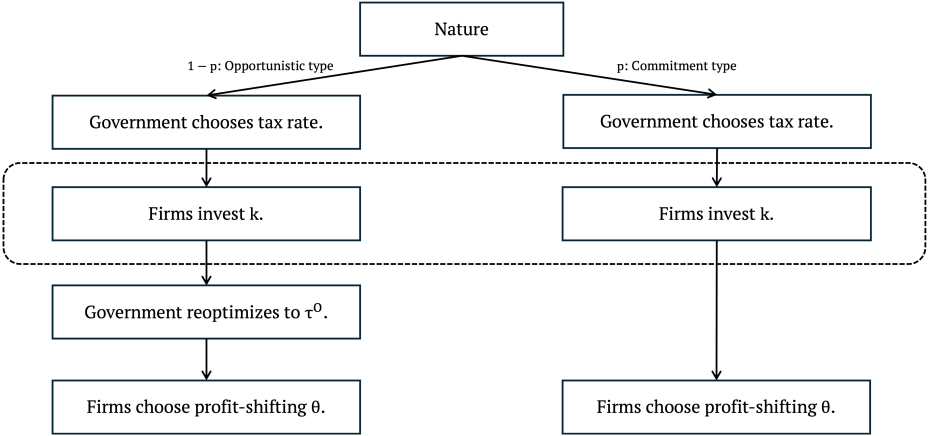
- Three stylized facts from the data
    1. Better government reputation $\Rightarrow$ Lower corporate tax rate
    2. Better government reputation $\Rightarrow$ Higher FDI inflows
    2. Better government reputation $\Rightarrow$ Less profits shifted outside the country

Alternative Measure

- I rationalize these facts with a model that extends capital taxation framework of Chari, Kehoe, and Prescott (1988) by adding reputation.
- Government type is not observed in the data, so we compare the two equilibria under each government type in the model to the data.

Static Model

- Government reputation is probability p of government being the commitment type.



Stage 4: Profit-shifting Decision after Tax Realization

- Firms choose profit-shifting amount θ given investment k, before-tax profit $\rho(k) = zk^\alpha - r^*k$ and tax rates τ, τ^*.

- Profit-shifting incurs a real quadratic cost as in Hines and Rice (1994)

▸ Different γ ▸ Asymmetric Cost

$$\max_\theta \ (1-\tau)\left[\rho(k) + \theta - \frac{\gamma}{2}\frac{\theta^2}{\rho(k)}\right] + (1-\tau^*)\left[\rho(\bar{k}-k) - \theta - \frac{\gamma}{2}\frac{\theta^2}{\rho(\bar{k}-k)}\right]$$

$$\text{s.t. } \rho(k) + \theta - \frac{\gamma}{2}\frac{\theta^2}{\rho(k)} \geq 0$$

$$\rho(\bar{k}-k) - \theta - \frac{\gamma}{2}\frac{\theta^2}{\rho(\bar{k}-k)} \geq 0$$

- Optimal profit-shifting $\theta(k,\tau)$ is decreasing in τ.

Stage 3: Opportunistic Type's Deviation Tax

- Opportunistic type chooses tax given aggregate investment K.

$$\max_{\tau^O \in [0,1]} \tau^O \left[\Lambda(K) + \Theta\left(K, \tau^O\right) - \frac{\gamma}{2} \frac{\Theta\left(K, \tau^O\right)^2}{\Lambda(K)} \right]$$

- The first-order condition with respect to τ^O:

$$\Lambda + \Theta^O - \frac{\gamma}{2} \frac{{\Theta^O}^2}{\Lambda} + \tau^O \underbrace{\left[1 - \frac{\gamma \Theta^O}{\Lambda}\right] \frac{\partial \Theta}{\partial \tau^O}}_{\text{Tax Base Decrease } < 0} = 0 \tag{1}$$

- Profit-shifting prevents the opportunistic government from taxing away all the profits ($\tau^O = 1$).

- Optimal τ^O is increasing in investment K and decreasing in the commitment tax rate τ^R.

Stage 2: Firms' Investment Decision

- Firms choose investment $k \in [0, \bar{k}]$ to maximize expected sum of profits at home and foreign.

- Tax rate τ in the host country is random: $\tau = \tau^R$ with p and $\tau = \tau^O$ with $1 - p$.

$$\max_{k \in [0,\bar{k}]} \mathbb{E}_\tau \left[(1-\tau) \left[\rho(k) + \theta(k,\tau) - \frac{\gamma}{2} \frac{\theta(k,\tau)^2}{\rho(k)} \right] + (1-\tau^*) \left[\rho(\bar{k}-k) - \theta(k,\tau) - \frac{\gamma}{2} \frac{\theta(k,\tau)^2}{\rho(\bar{k}-k)} \right] \right]$$

- Profit-shifting mitigates tax distortion on investment.

$$\mathbb{E}_\tau \left[(1-\tau) \Bigg(1 + \underbrace{\frac{\gamma \theta(k,\tau)^2}{2\rho(k)^2}}_{\text{Mitigation}} \Bigg) \rho'(k) + (1-\tau^*) \left(1 + \frac{\gamma \theta(k,\tau)^2}{2\rho(\bar{k}-k)^2} \right) \rho'(\bar{k}-k) \right] = 0$$

Stage 1: Optimal Commitment Tax Rate

- Both types of government choose the optimal tax rate τ^R at stage 1.
- The commitment type maximizes tax revenue while internalizing investment, profit-shifting choices and the opportunistic type's deviation.

$$\max_{\tau^R \in [0,1]} \; \tau^R \left[\Lambda(K(\tau^R)) + \Theta(K(\tau^R), \tau^R) - \frac{\gamma}{2} \frac{\Theta(K(\tau^R), \tau^R)^2}{\Lambda(K(\tau^R))} \right]$$

- The first-order condition:

$$\Lambda + \Theta^R - \frac{\gamma}{2} \frac{{\Theta^R}^2}{\Lambda} + \tau^R \left[\left[1 - \frac{\gamma \Theta^R}{\Lambda} \right] \frac{\partial \Theta}{\partial \tau^R} + \frac{\partial}{\partial K} \left[\Lambda + \Theta^R - \frac{\gamma}{2} \frac{{\Theta^R}^2}{\Lambda} \right] \frac{\partial K}{\partial \tau^R} \right] = 0 \qquad (2)$$

Proposition

Optimal conditions (1) and (2) yield $\tau^R < \tau^O$ *if* $dK/d\tau^R < 0$ *and* $\frac{\partial}{\partial K} \left[\Lambda + \Theta^R - \frac{\gamma}{2} \frac{{\Theta^R}^2}{\Lambda} \right] > 0$.

Static Equilibrium

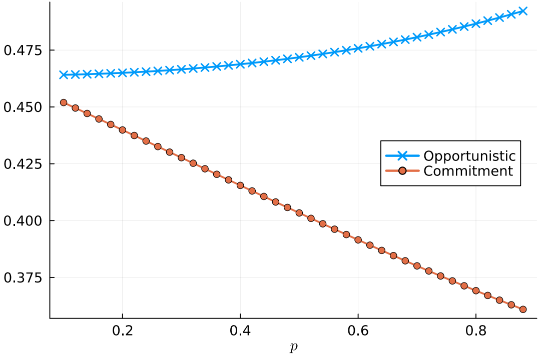
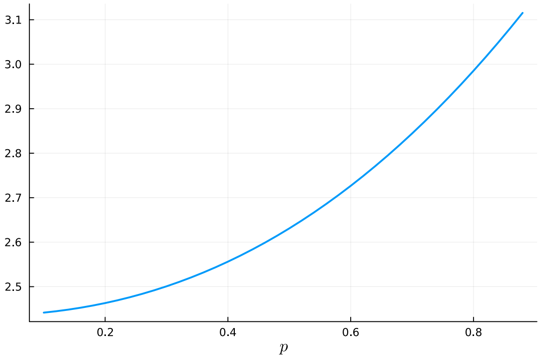


Figure 4: Optimal Tax Rate

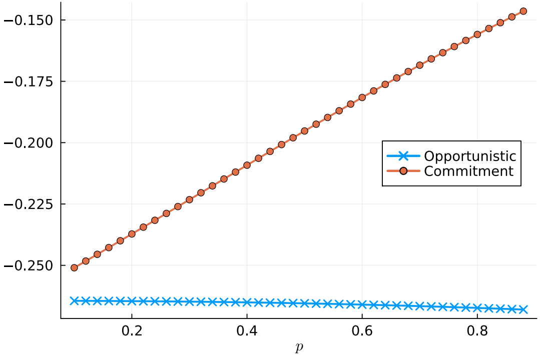
- As reputation p goes up, firms invest more but this increases the incentive to deviate ($\tau^O \uparrow$). The commitment type optimally chooses to lower the commitment tax rate τ^R.

▸ Parameter

Static Equilibrium



(a) Investment K

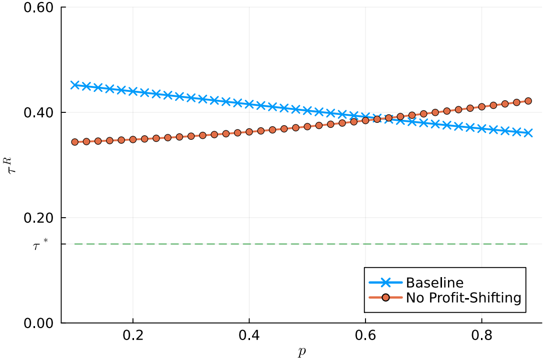


(b) Profit-shifting Portion $\frac{\Theta}{\Lambda(K)}$

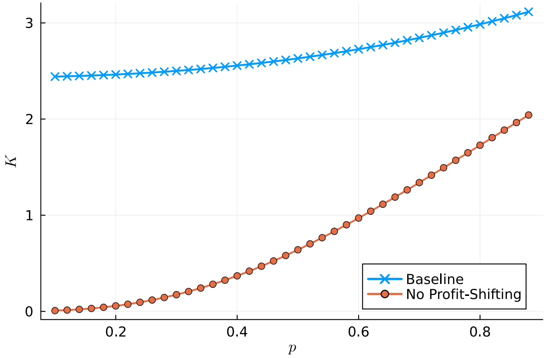
- Expected tax rate decreases in reputation p so investment is higher with better reputation.

Role of Profit-Shifting

- Without profit-shifting, higher reputation p decreases the expected tax rate $p\tau^R + (1-p)$ so investment significantly rises (steeper $K(p)$).
- With profit-shifting, higher reputation p only slightly decreases the expected tax rate.



(a) Commitment Tax Rate τ^R



(b) Investment K

Countervailing Effects of Reputation on Optimal Tax Rate

- Government announces a tax rate τ from firms invest and firms believe that the government commits to that tax rate with probability p.

- Consider tax revenue maximization without profit-shifting:

$$\text{Tax Revenue} = \tau\Pi(K(\tau,p))$$

$$0 = \Pi(K(\tau^*,p)) + \tau^* K_\tau(\tau^*,p)\Pi_K(K(\tau^*,p))$$

$$\Rightarrow \frac{d\tau^*}{dp} = \underbrace{-\frac{1}{2}\left(K_\tau(\tau^*,p)\right)^{-1}}_{>0}\left[\underbrace{K_p(\tau^*,p)}_{>0} + \underbrace{\tau^*\partial_p K_\tau(\tau^*,p)}_{<0}\right] \text{ up to first order}$$

- Without profit-shifting, the first term dominates the second term.

- While profit-shifting adds additional terms to tax revenue, it diminishes $K_p(\tau^*,p)$ significantly and induces $d\tau^*/dp < 0$.

Extensions

- Qualitatively the same relationship holds between the optimal commitment tax rate and reputation in a two-period game.
  - I study a two-period setting similar to Dovis and Kirpalani (2021) while imposing full capital depreciation.
  - The commitment type optimally hides its type by choosing "intermediate" level of tax that decreases in prior reputation p.
- The relationship also holds for higher degrees of convexity of the profit-shifting cost function.
- Changing the values of γ or imposing asymmetric γ across countries do not affect the result.

Concluding Remarks

- Analyzed novel empirical relationship between government reputation, corporate tax rate, and multinational firms' FDI and profit-shifting
- Qualitatively matched the empirical facts with a simple model of corporate taxation with profit-shifting and reputation
- Explained how adding profit-shifting to a simple corporate taxation framework disciplines the effect of reputation on optimal tax rate

References I

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Dovis, A., & Kirpalani, R. (2021). Rules without commitment: Reputation and incentives. *The Review of Economic Studies*, *88*(6), 2833-2856.

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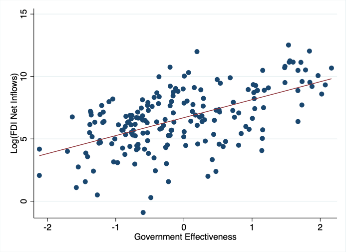
Garcia-Bernardo, J., & Jansky, P. (2021). *Profit shifting of multinational corporations worldwide* (Working Paper No. 14). Prague, Czechia: Institute of Economic Studies.

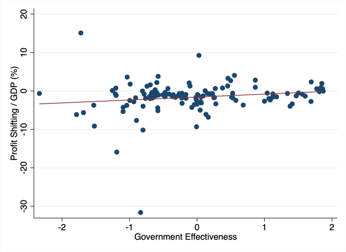
Hines, J., James R., & Rice, E. M. (1994). Fiscal paradise: Foreign tax havens and American business. *Quarterly Journal of Economics*, *109*(1), 149–182.

Alternative Measure of Reputation

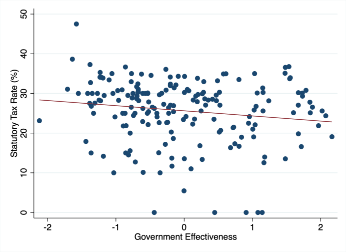
- I also plot the Government Effectiveness Index by World Bank to mean annual FDI net inflows, statutory tax rates in 2000–2021, and profit-shifting in 2016.



(a) Logs of FDI Net Inflows



(b) Profit-Shifting / GDP (%)

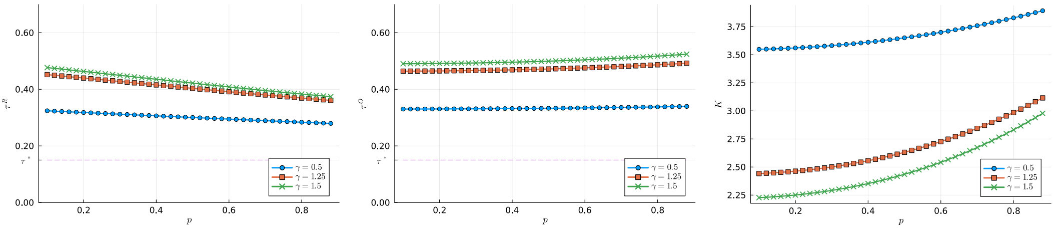


(c) Statutory Corporate Tax Rate

Return

Different Values of γ

- Higher γ allows governments to impose higher tax rates.
- Investment decreases correspondingly but the fraction of profits shifted outside does not vary monotonously as reputation gets higher.



(a) Commitment Tax Rate τ^R (b) Deviation Tax Rate τ^O (c) Investment K

Return

Asymmetric Cost of Profit-shifting

- Legal costs of profit-shifting or profit-shifting ablity of firms can be different across countries ($\gamma \neq \gamma^*$)

- Imposing $\gamma \neq \gamma^*$ changes the Stage 4 problem:

$$\max_{-\pi(k) \leq \theta \leq \pi^*(k)} (1-\tau)\left[\pi(k) + \theta - \frac{\gamma}{2}\frac{\theta^2}{\pi(k)}\right] + (1-\tau^*)\left[\pi^*(k) - \theta - \frac{\gamma^*}{2}\frac{\theta^2}{\pi^*(k)}\right]$$

- First-order condition with respect to θ:

$$\theta = \frac{(\tau^* - \tau)\pi(k)\pi^*(k)}{\gamma(1-\tau)\pi^*(k) + \gamma^*(1-\tau^*)\pi(k)}$$

- Magnitude of profit-shifting decreases if $\gamma^* > \gamma = 0.7$, but qualitatively similar results.

Return

Parameters

Table 4: Parameter Values

Parameter	p	z	α	γ	τ^*	r^*	$\bar{k}$
Value	[0.1, 0.9]	1	0.66	1.25	0.3	0.04	10

Return