

Global Evidence on Profit Shifting Within Firms and Across Time

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Profit shifting

- Shifting profit from one company of the Global Ultimate Owner (GUO) that is based in a high tax jurisdiction to another company in a low tax jurisdiction.
- Mostly legal
- Do we know how much by each company?

Our aim

- Provide the first global database of profit shifting with information at the firm-year level.
- For all firms with unconsolidated data (parent and subsidiaries).
- Assign a monetary profit shifting estimate to all firms.
- Reconcile the gap between macro and micro studies in the estimation of profit shifting.

How?

Hines and Rice (1994), Huizinga and Laeven (2008), OECD and meta-studies model (Johansson et al., 2017; Beer et al., 2020; Heckemeyer and Overesch, 2017):

$$\log \pi_{it} = \underline{a_1 CT_{it}} + \underline{a_2 \log A_{it}} + \gamma C_{it} + \mu_i + \delta_t + \varepsilon_{it}$$

$$CT_{it} = \frac{1}{(1-\tau_i)} \frac{\sum_{k \neq i}^n \left(\frac{1}{1-\tau_k}\right) (\tau_i - \tau_k)}{\sum_{k=1}^n \left(\frac{1}{1-\tau_k}\right)}$$

How?

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Positive
shift profits **out** of
the country
(Outbound)



Negative
shift profits **in** the
country (Inbound)

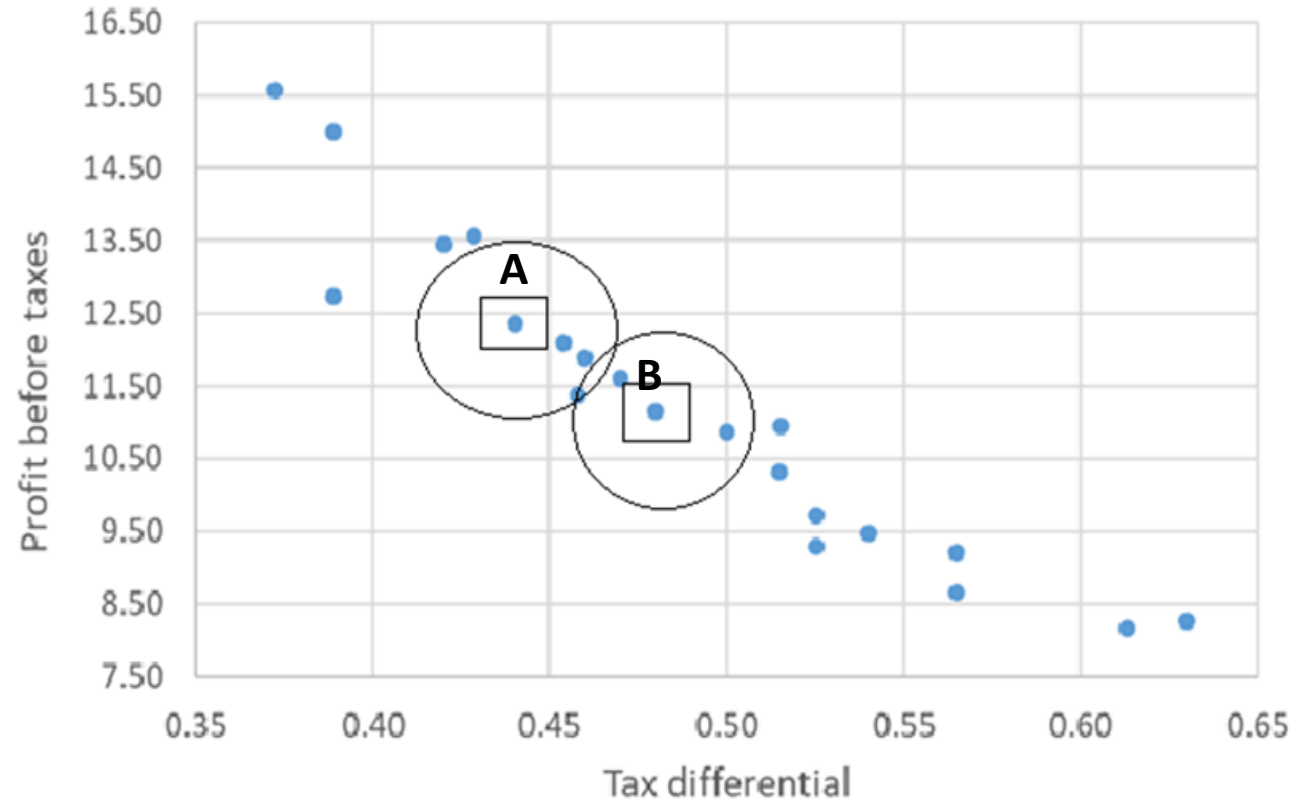
How?

$$\log \pi_{it} = a_1 CT_{it} + a_2 \log A_{it} + \gamma C_{it} + \mu_i + \delta_t + \varepsilon_{it}$$

Why? Contribution

- Profit shifting is a very big global issue, with trillions of tax avoidance. Our index can inform policymakers and academics about profit shifting intensity at a granular level.
- Captures origin and destination firms of profit shifting over time, which is important for identifying tax arbitrage behavior.
- Has a direct monetary interpretation.
- Can enhance the identification of key drivers or outcomes of profit shifting.

How? Non-parametric estimation





Data

- Orbis, Bureau Van Dijk
- 2,277,435 firm-year observations
- Period 2009-2020
- 565,814 firms under 214,001 GUOs
- 100 countries for unconsolidated firms; 189 for GUOs
- Top statutory tax rates (EY, PwC, IBFD and Tax Foundation)

Data

- Different historical Bureau van Dijk disks; Orbis “vintages” (Kalemli-Özcan et al., 2022).
- Orbis vintage 2021b-Orbis vintage 2022 and the historical ownership links (2009-2019).
- Dynamic ownership data, which alleviate misclassification and any downward bias in our estimates of profit shifting (Budd et al., 2005).
- Coverage beyond the ten-year period offered in Orbis online.

Our findings-OLS

	(1)	(2)	(3)
Tax differential	-3.396***	-2.098***	-1.809***
	[0.024]	[0.019]	[0.021]
Tax haven			0.323***
			[0.003]
Tax differential # Tax haven			-1.040***
			[0.032]
Observations	2,277,416	2,277,435	2,277,435
Adjusted R-squared	0.176	0.552	0.555
Country	Y	Y	Y
Year	Y	Y	Y
Controls	Macro	Micro & Macro	Micro & Macro

Our findings-OLS

- The average coefficient of specifications (2.5).
- Beer et al. (2020) indicate large aggregate effects vs small micro effects (semi-elasticity of 2.29 in macro studies vs 1 in micro-data studies).
- Clausing's (2016) reports an average semi-elasticity of 2.92, and in her more recent studies (Clausing 2020a, 2020b), a semi-elasticity of 3.
- Average semi-elasticity of 1.80 reported by Blouin and Robinson (2020).

Our findings-non parametric

year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Semi-elasticity	2.36	2.93	3.02	2.74	2.71	2.75	2.94	3.15	3.02	2.53	2.14	2.66
Standard deviation	0.78	0.74	0.85	0.86	0.9	0.69	0.54	0.7	0.92	1.02	1.02	1.23
Profit shifting	308	394	482	490	617	492	466	568	635	446	336	275
Missing profits (Torslov)							616	667	741	946	969	

Top 20 profit shifting MNEs

Company	MNE Profit shifting (\$Bn.)	Consolidated profits (\$Bn.)	MNE Profit shifting ratio	Semi-elasticity
Apple Inc.	148	628	0.24	2.49
Exxon Mobil Corp	117	449	0.26	2.78
Saudi Arabia Oil Company (Saudi Aramco)	107	628	0.17	2.52
Microsoft Corporation	95	357	0.27	2.53
Samsung Electronics Co. Ltd	80	347	0.23	2.25
Chevron Corporation	73	252	0.29	2.68
Shell Plc	70	311	0.22	3.03
Walmart Inc.	68	255	0.27	2.19
At&T Inc.	66	204	0.33	2.51
Verizon Communications Inc.	60	224	0.27	2.60
Intel Corp	59	203	0.29	2.67
Alphabet Inc.	56	273	0.21	2.46
Oracle Corp	45	141	0.32	2.19
General Motors Company	44	185	0.24	2.60
Johnson & Johnson	44	157	0.28	2.66
Nestle S.A.	44	205	0.21	2.76
Toyota Motor Corporation.	41	193	0.21	2.94
Petroliam Nasional Berhad	41	201	0.20	3.02
Roche Holding AG	40	166	0.24	2.70
Totalenergies Se	40	217	0.18	2.96

Top inbound profit shifting connections

Country	GUO country	Profit shifting		
		ratio	Observations	Semi-elasticity
Ireland	France	0.32	560	2.49
Ireland	United States	0.31	3,931	2.52
Slovakia	France	0.31	1,630	3.42
Ireland	Japan	0.31	404	2.51
Ireland	Spain	0.31	221	2.73
Ireland	Australia	0.30	147	2.47
Ireland	Belgium	0.30	148	2.53
Ireland	Germany	0.30	677	2.45
Hungary	United States	0.30	2,655	2.45
Hungary	France	0.30	1,377	2.40

Top GUO countries ranking by average semi-elasticity

GUO country	Observations	Semi elasticity
Bahrain	106	3.03
Bermuda	7,361	2.97
Cayman Islands	11,027	2.90
Liechtenstein	4,327	2.89
Andorra	211	2.86
Cyprus	69,995	2.86
San Marino	342	2.84
Gibraltar	1751	2.82
Bahamas	1,349	2.82
British Virgin Islands	23,590	2.73
United Arab Emirates	3,149	2.71
Kuwait	583	2.70
Uruguay	198	2.67
Marshall Islands	328	2.67

Top profit-shifting connections by GUO country and low-tax MNE destination

GUO country	Lowest tax rate in the MNE group	MNE Profit shifting (\$Bn.)	Observations	Semi-elasticity
United States	Bermuda	578	17,121	2.74
United States	Cayman Islands	500	22,505	2.74
United States	United Arab Emirates	390	30,727	2.69
United States	British Virgin Islands	231	9,786	2.62
United States	Ireland	209	15,107	2.83
Japan	United Arab Emirates	164	26,410	2.44
Germany	United Arab Emirates	159	32,895	2.81
France	United Arab Emirates	126	47,169	2.80
United Kingdom	United Arab Emirates	120	17,231	2.90
United States	Bahamas	116	2,587	2.77

Thank you for your time!