

Transfer Pricing Trainings in the Global South: Are They Effective in Mobilising Domestic Revenues?

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Agenda

- 1 Motivation
- 2 Empirical Literature
- 3 Data & Estimation Strategy
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- 5 Case Study: Colombia
- 6 Conclusion

Motivation

- Transfer pricing (TP) is the main channel for multinational enterprises (MNEs) to shift profits from high-tax to low-tax affiliates and avoid tax
- TP legislation is a popular anti-tax avoidance rule introduced by 177 countries in 2019 to tackle tax avoidance and increase revenues from corporate taxation
- Many tax administrations in low capacity countries request technical trainings in the area of TP to enforce the complex legislation
- The Tax Inspectors Without Borders (TIWB) initiative (by UNDP & OECD) provides TP audit training on request to low capacity tax administrations

Research question:

Are TIWB trainings effective in mobilising more corporate income tax revenues in the long-run?

Empirical Literature

Effects of capacity building in tax administrations of developing countries on revenue mobilisation

Cross-country studies:

- TIWB effect on real investment (Ferguson et al. 2022)
- Large Taxpayer Units (LTUs) (Benon et al. 2002; Bachas & Jensen 2015; Vehorn 2011)
- Semi-autonomous revenue authorities (SARAs) (e.g. Ngoma & Krsic 2017)

Single country studies (examples):

- Tennant & Tracey (2019): LTU in Jamaica
- Von Soest (2008): Donor support for tax administration reforms in Ghana, Tanzania, Uganda and Zambia
- Von Haldenwang et al. (2014): SARA in Peru

Contribution:

Assessing the **dynamic effects** of TIWB trainings on revenue mobilisation using cross-country panel data

Data

Unbalanced cross-country panel dataset for 140 low and middle income countries from 2007-2019!

Dependent variable

Log of corporate income tax revenue (in thousand USD) and tax base

Sources: UNU-WIDER, OECD, Tax Foundation

Treatment variable

Indicator variable that turns one when country receives first TIWB training, otherwise zero (Source: TIWB website)

Control variables

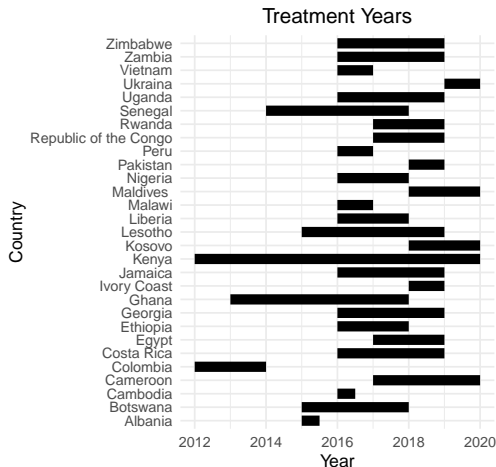
- TP legislation and general anti-avoidance rule indicators (ITI database, RSIT)
- Statutory corporate income tax rate (Tax Foundation)
- Tax-to-GDP ratio (UNU-WIDER, OECD)
- Log GDP per capita in USD, GDP growth, Trade openness (WDI, World Bank)
- Polity 2 democracy index (Polity IV Project)

TIWB Training Data

Selection criteria and characteristics:

- 29 programmes completed by 2020 (17 in Africa)
- North-South programmes
- Tax inspectors: serving or former tax officials from partner administrations in Europe or OECD experts
- Focus on TP audits
- At least 13 provided also legislative advice
- ∅ duration: 2 years 4 months
- ∅ staff trained: 20
- ∅ audits advanced / completed: 9

Staggered adoption of TIWB:



Source: Own illustration, TIWB website (UNDP and OECD 2021).

Estimation Strategy

Identification: Divide countries into cohorts that have started TIWB training in the same year. Then compare cohorts with control group before and after TIWB trainings.

Treatment groups

Cohorts of countries that received first TIWB training in the same year

Control group

Low and middle income countries that had no TIWB completed by 2020

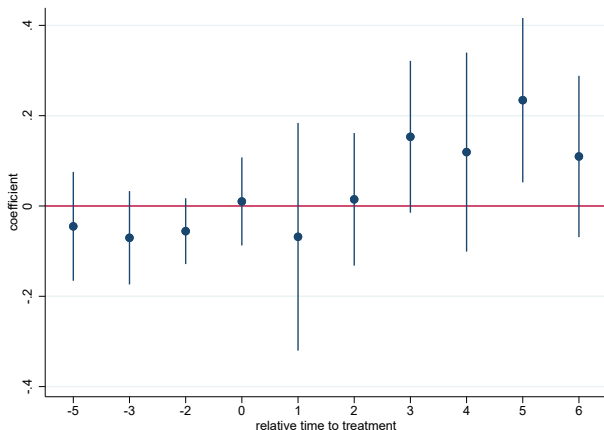
Dynamic difference-in-difference regression model:

$$\ln CIT_{i,t} = \alpha_i + \gamma_t + \sum_{e \notin C} \sum_{l \neq -1, -4} \delta_{e,l} (\mathbf{1}\{E_i = e\} \cdot D_{i,t}^l) + \mathbf{X}'_{i,t} \beta + \epsilon_{i,t} \quad (1)$$

Estimation technique: Interaction-weighted estimator by Sun & Abraham (2021)

Results: Effect of TIWB on countries' tax revenue

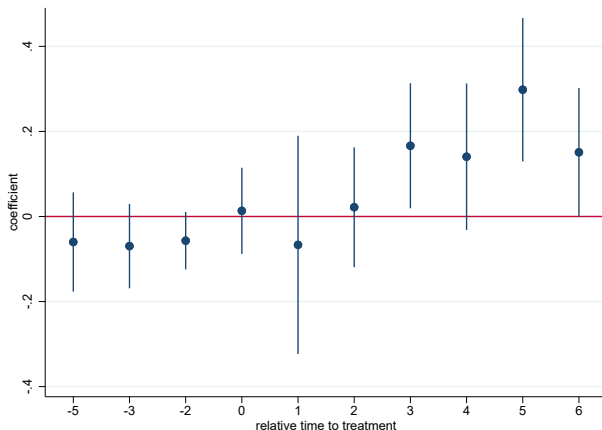
TIWB training increases corporate income tax revenues by about 11-23 %.



Notes: Coefficients represent Abraham & Sun event study estimates. Dependent variable is ln of corporate income tax revenues in USD. The event is the staggered adoption of TIWB trainings from 2012-2020. Event leads -1 and -4 are excluded due to multicollinearity reasons. Unbalanced panel, trimmed relative to event time. Blue vertical lines indicate 95% confidence intervals.

Results: Effect of TIWB on countries' tax base

TIWB training increases corporate income tax base by about 14-30 %.



Notes: Coefficients represent Abraham & Sun event study estimates. Dependent variable is \ln of corporate income tax base in USD. The event is the staggered adoption of TIWB trainings from 2012-2020. Event leads -1 and -4 are excluded due to multicollinearity reasons. Unbalanced panel, trimmed relative to event time. Blue vertical lines indicate 95% confidence intervals.

Case Study: Colombia

Setting: Colombia started a pilot TIWB training in 2012 with focus on increasing TP audit capacities. The programme consisted of 9 one-week missions over 2 years and 7 months and raised about 3 million USD in additional revenue (TIWB report).

Research question: Do multinational firms in Colombia pay more tax after the TIWB programme took place in 2012?

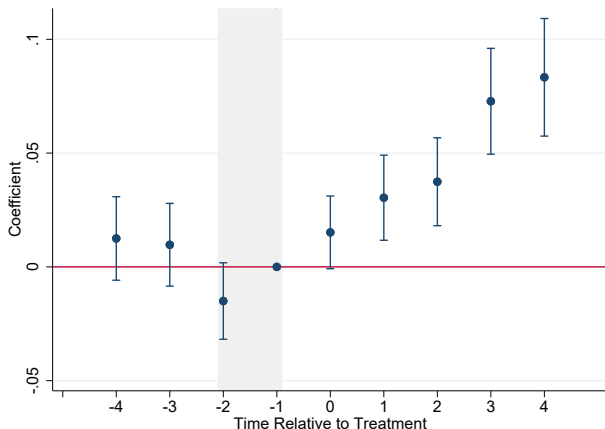
Data: Firm-level data on effective tax rates (ETRs) of multinational and domestic firms in Colombia from 2007-2016 (Orbis database)

Identification: Compare multinational firms (treatment group) and domestic firms (control group) before and after TIWB training started. Only the multinational firms can engage in profit shifting and are targeted in TP audits.

Method: Dynamic diff-in-diff regression model estimated with OLS

Results: Effect of TIWB training on firms' ETR

After the start of the TIWB training in Colombia in 2012, the ETRs of multinational firms in Colombia rose by 3-8 p.p. compared to the ETRs of domestic Colombian firms.



Notes: Estimated coefficients are OLS estimates. Dependent variable is effective tax rate (ETR). Control variables include fixed assets, operating revenue and total assets. Firm, year and industry fixed effects are included. Vertical blue lines indicate 90 percent confidence intervals.

Conclusion

Findings:

- This paper fills an important research gap on the long-term revenue impacts of tax capacity building programmes in the area of transfer pricing.
- Using cross-country panel data, TIWB trainings increase tax revenue and base from three years after the training started onwards (fading out effect?)
- Using firm-level data for Colombia, multinational firms pay more taxes after TIWB increased audit capacity (upward bias?)

Outlook:

- Accounting for the length and content of TIWB trainings in the estimation
- Controlling for other anti-tax avoidance rules and tax capacity building programmes

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Appendix

- Summary Statistics Macrodata
- TIWB Data
- Summary Statistics Microdata
- Estimation Strategy Microdata

Macrodata

Unbalanced cross-country panel dataset for 140 low and middle income countries from 2007-2020.

Variable	Obs	Mean	SD	Min	Max	Description	Source
Dependent variables:							
In CIT revenue	1,188	19.97	3.24	0	26.76	logarithmised corporate income tax revenue in USD	UNU-WIDER (2021); OECD 2022
In CIT base	1,079	21.89	2.12	16.22	28.15	logarithmised corporate income tax base in USD	UNU-WIDER (2021); OECD 2022
TP variables:							
TIWB	1,890	0.08	0.27	0	1	one from first TIWB year onwards; otherwise zero	UNDP and OECD 2021
TPlegis	1,890	0.64	0.48	0	1	one if TP legis in force; otherwise zero	RSIT, 2022
GAAR	1,890	0.18	0.39	0	1	one if GAAR in force; otherwise zero	RSIT, 2022
Control variables:							
STR	1,711	0.25	0.08	0	0.5	Statutory corporate income tax rate	Tax Foundation (2022)
tax-to-GDP	1,549	17.87	8.44	0.83	60.95	Total tax-to-GDP ratio	UNU-WIDER 2021
log GDPPC	1,548	7.82	1.00	5.35	9.93	log GDP per capita	World Bank (2021)
GDP growth	1,553	3.94	5.69	-62.08	123.14	annual GDP growth (in %)	World Bank (2021)
trade	1,470	80.87	36.48	0.167	376.22	trade (% of GDP)	World Bank (2021)
polity 2	1,372	2.99	5.69	-9	10	autocracy = -10; democracy = 10	Polity IV Project (2021)

TIWB Data

Country name	start date	end date	experts	length in months	missions completed	days in country	TPlegis advice	officials trained	audits
Albania	Jan-15	Dec-15	1	12	1	218	0		1
Botswana	Feb-15	Apr-17		27	4	20	1	20	
Cambodia	Dec-16	Mar-17		4	1	5	1	25	2
Cameroon	Oct-17	Jan-19		16	7	31			
Colombia	Apr-12	Oct-14		31	9	40	1		
Costa Rica	Sep-16	Nov-17	2	15	5	20	1	20	15
Ivory Coast	Oct-18	Dec-19		15	6	30			
Egypt	Jan-17	May-19	2	29	7	35	0	20	
Ethiopia	Mar-16	Nov-18		33	9	51			
Georgia	Sep-16	Feb-17	1	6	3	15	0	7	8
Ghana	Dec-13	Mar-18	2	52	9	42	1	10	12
Jamaica	Apr-16	Sep-18	1	30	4	25	0		
Kenya	Jul-12	Jun-20	1	96	18	70	1	25	7
Kosovo	Aug-18	May-20	1	22	6	29	0	5	17
Lesotho	Dec-15	Jan-19		38	11	56	1	10	7
Liberia	Jun-16	Nov-18	1	30	10	52	1	6	2
Malawi	Apr-16	Apr-17		13	5	25			
Maldives	Aug-18	Jul-20	1	24	6	23	1	30	20
Nigeria	Jun-16	May-18	1	24	6	34	1	17	12
Pakistan	Sep-18	Nov-19		15	4	27			
Peru	Oct-16	Sep-17		12	2	7			
Republic of the Congo	Sep-17	May-19		21	6	28			
Rwanda	Oct-17	Sep-19		24	6	23			
Senegal	Dec-14	Dec-15	1	13	6	30	0	1	2
Uganda	Mar-16	Mar-18		25	4	20	1	25	
Ukraine	Feb-19	Sep-20	2	20	3	18	0	35	12
Vietnam	Apr-15	Jun-17	2	27	4	16	1	50	6
Zambia	Jun-16	Dec-18	2	31	3	9	1	25	multiple
Zimbabwe	Feb-16	Sep-19		44	4	16			

Sources: TIWB website and TIWB programme reports as of October 2022.

Microdata

The sample consists of 5,087 domestic Colombian firms (control group) and 1,109 Colombian MNC affiliates (treatment group).

Summary Statistics:

Variable	Colombian MNC firms			Colombian domestic firms		
	Obs	Mean	SD	Obs	Mean	SD
ETR (tax payments/pre-tax profits)	6,088	0.379	0.248	25,600	0.331	0.232
ln(pre-tax profits)	6,732	7.032	2.036	34,585	5.302	2.038
ln(fixed assets)	6,898	7.341	2.907	36,256	6.322	2.654
ln(total assets)	7,058	9.363	1.973	37,016	7.830	2.092
ln(operating revenues)	6,738	9.504	1.858	34,960	7.818	1.717
profitability (EBIT/total assets)	6,587	0.162	0.159	33,649	0.136	0.150

Source: Orbis database (Bureau van Dijk 2018). All financial variables in thousand USD.

Estimation Strategy Microdata

Dynamic diff-in-diff regression model:

$$ETR_{i,t} = \alpha_i + \gamma_t + \phi_j + \sum_{\ell \neq -1} \delta_\ell D_{i,t}^\ell + \mathbf{X}'_{i,t} \beta + \epsilon_{i,t}$$

- Dependent variable is the effective tax rate (ETR) of firm i in year t
- The binary treatment variable D equals one for all MNC affiliates from 2012 onwards and zero otherwise.
- The coefficients of interest are δ s in the post-treatment periods ($\ell \geq 0$) that capture the effect of TIWB training on ETRs of MNC affiliates.
- I control for fixed assets, operating revenue and total assets of firms (X)
- Firm, year and industry fixed effects are included ($\alpha_i, \gamma_t, \phi_j$)
- ϵ_{ifght} is the error term
- The model is estimated with OLS