The Global Allocation of Extractive Windfalls

Alice Chiocchetti[1], Ninon Moreau-Kastler[1 2]

[1]Paris School of Economics

[2]EUTax Observatory

August 11, 2025

We gratefully acknowledge financial support from IGC Tax for Growth and the Research Council of Norway grant numbers 352981 and 341289.

Motivation

Next decades expected to increase mining, oil and gas prices

Green transition commodity boom, increased energy demand, geopolitical shocks...

1. Extractive resources are a major source of fiscal revenues in many countries
   - 46% in DRC, 60% Angola, 57% in Nigeria.
2. Extractive windfalls often shared with multinational groups (MNEs):
   - 70% of oil & gas produced by foreign MNE in Nigeria & Thailand.
   - 40% of mining commodities produced by 15 firms headquartered in the US and Europe (Raw Materials Data, 2011).
3. They operate and locate profits in multiple countries & sectors
   - Globally integrated activity from extraction to sale.
     Ex: Total, Glencore.

   → Profit allocation reflect activity, but could also be driven by tax optimization.

Motivation

Les Echos

Taxe sur les superprofits pétroliers : les raisons d'un échec

Les chercheurs de l'Institut des politiques publiques ont analysé pourquoi la taxe sur les rentes pétrolières n'a rapporté que 69 millions d'euros en 2023, alors qu'ils avaient chiffré son rendement à 3 milliards. Ils recommandent une coordination à l'échelle européenne pour éviter de nouvelles déconvenues.

Les Echos

Esso : la justice ordonne une expertise sur les contrats avec sa maison mère ExxonMobil

Le fonds activiste CIAM et trois autres actionnaires ont obtenu de la cour d'appel de Versailles la nomination d'un expert indépendant. Les minoritaires soupçonnent ExxonMobil de léser sa filiale.

Chevron Australia Holdings Pty Ltd v Commissioner of Taxation

Chevron's Gorgon gas project in Australia was supposed to generate enough tax revenue to facilitate personal tax cuts for every Australian. Instead, most of the profits were siphoned off into offshore tax havens.

Reuters

Business

Special Report: How oil majors shift billions in profits to island tax havens

By **Tom Bergin** and **Ron Bousso**

December 9, 2020 9:59 AM PST · Updated 4 years ago

OUR NETWORK

NATIONAL

Sars wrestles with BP in multimillion-rand tax rebate dispute

Tax agency says 3-million gallons of diesel was not exported to Zimbabwe as claimed

BL PREMIUM

15 JANUARY 2024 - 05:45

Reuters

Energy | Exploration & Production

Danish supreme court rules against Maersk and TotalEnergies in tax case

By **Reuters**

September 6, 2023 6:30 AM PDT · Updated a year ago

Home > Latest updates >

Oil and gas multinationals avoid up to $2 billion in taxes in Mozambique

Reuters

Business

Unions accuse Chevron of 'massive' tax avoidance via the Netherlands

By **Anthony Deutsch**

October 9, 2018 8:08 AM PDT · Updated 6 years ago

OXFAM
RESEARCH BACKGROUNDER

Potential Corporate Tax Avoidance in Zambia's Mining Sector?

How Vale mining got its tax so wrong in Brazil and Switzerland

January 08, 2013

Vale, one of the world's largest mining companies, has settled tax disputes in both Brazil and Switzerland totalling $486 million, which will affect its fourth quarter profits this year.

CNBC MARKETS BUSINESS INVESTING TECH POLITICS VIDEO INVESTING

ENERGY

U.S. oil giants Exxon Mobil, Chevron and ConocoPhillips challenged over 'secretive' tax practices

PUBLISHED MON, NOV 21 2022•10:22 AM EST | UPDATED TUE, NOV 22 2022•1:24 AM EST

Motivation

Next decades expected to increase mining, oil and gas prices

Green transition commodity boom, increased energy demand, geopolitical shocks...

1. Extractive resources are a major source of fiscal revenues in many countries
   - 46% in DRC, 60% Angola, 57% in Nigeria.
2. Extractive windfalls often shared with multinational groups (MNEs):
   - 70% of oil & gas produced by foreign MNE in Nigeria & Thailand.
   - 40% of mining commodities produced by 15 firms headquartered in the US and Europe (Raw Materials Data, 2011).
3. They operate and locate profits in multiple countries & sectors
   - Globally integrated activity from extraction to sale.
     Ex: Total, Glencore.

   → Profit allocation reflect activity, but could also be driven by tax optimization.

⇒ Crucial question of rent sharing when price booms generate windfalls

RQ: How extractive windfalls are located along the geography of the largest extractive multinational groups? How does it affect the repartition of taxes and windfalls accross states?

What we do

1. Study MNEs global profit allocation following world commodity price shocks.
   - Use global prices as shocks to extractive MNEs profitability.
   - Compute MNE-specific commodity exposure.
   - Compare profit-elasticity of affiliates
     - In low-tax VS high-tax countries
     - Along the value chain: Upstream→ Midstream & Downstream

2. Study field and mine tax payments to states
   - Buy compiling new data from extractive reports published by listed firms.
   - Compare price-elasticities between countries with different levels of development.

What we do

1. Study MNEs global profit allocation following world commodity price shocks.
   - Use global prices as shocks to extractive MNEs profitability.
   - Compute MNE-specific commodity exposure.
   - Compare profit-elasticity of affiliates
     - In low-tax VS high-tax countries
     - Along the value chain: Upstream→ Midstream & Downstream

2. Study field and mine tax payments to states
   - Buy compiling new data from extractive reports published by listed firms.
   - Compare price-elasticities between countries with different levels of development.

Literature

- Extractive windfalls (& resource curse): *Adebayo, Lashitew, and Werker 2021; Arezki and Brückner 2011; Caselli and Michaels 2013; Michaels 2011; Asher and Novosad 2023; Berman et al. 2017; Andersen et al. 2017; Van der Ploeg and Poelhekke 2009*

  → MNEs structure determine the allocation of extractive windfalls across countries & Profit shifting potential channel of resource curse.

- Transmission of shocks inside multinational firms: *Cravino and Levchenko 2017; Dharmapala and Riedel 2013; Budd, Konings, and Slaughter 2005; Boehm, Flaaen, and Pandalai-Nayar 2019*

  → Transmission of revenue shocks through profit shifting.

- Profit shifting of MNEs: *Tørsløv, Wier, and Zucman 2023; Guvenen et al. 2022;Davies et al. 2018; Beer 2021; Bertinelli, Bourgain, and Zanaj 2022*

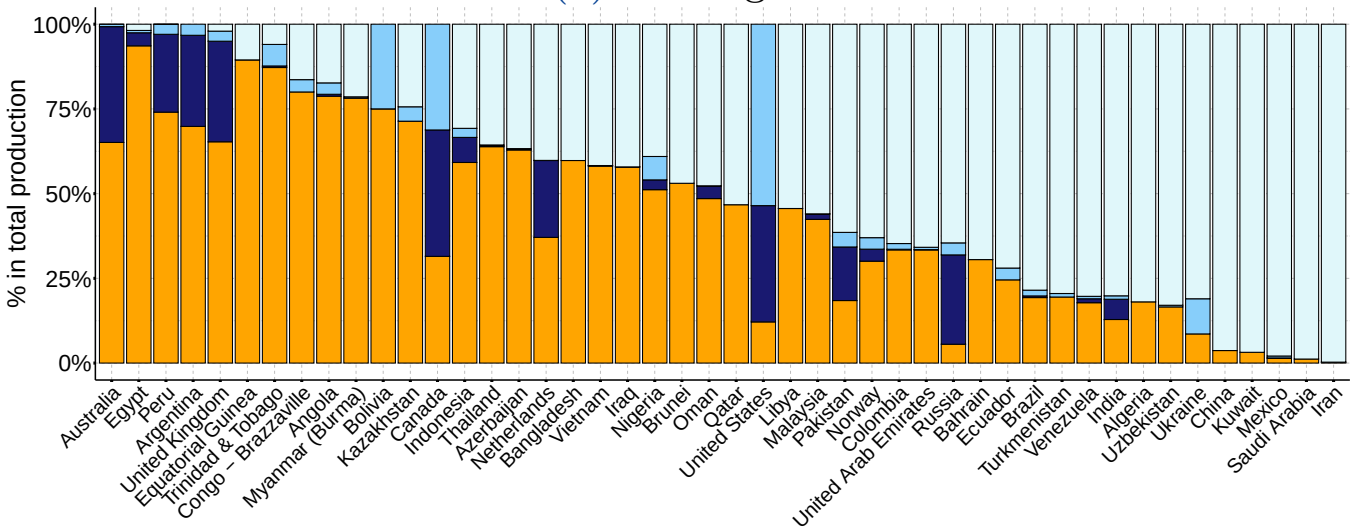
  → Evidence of time variation of profit shifting incentives.

- State capacity and taxes in developing countries: *Hanson and Sigman 2013; Gordon and Li 2009; Bachas and Soto 2021; Besley and Persson 2009*

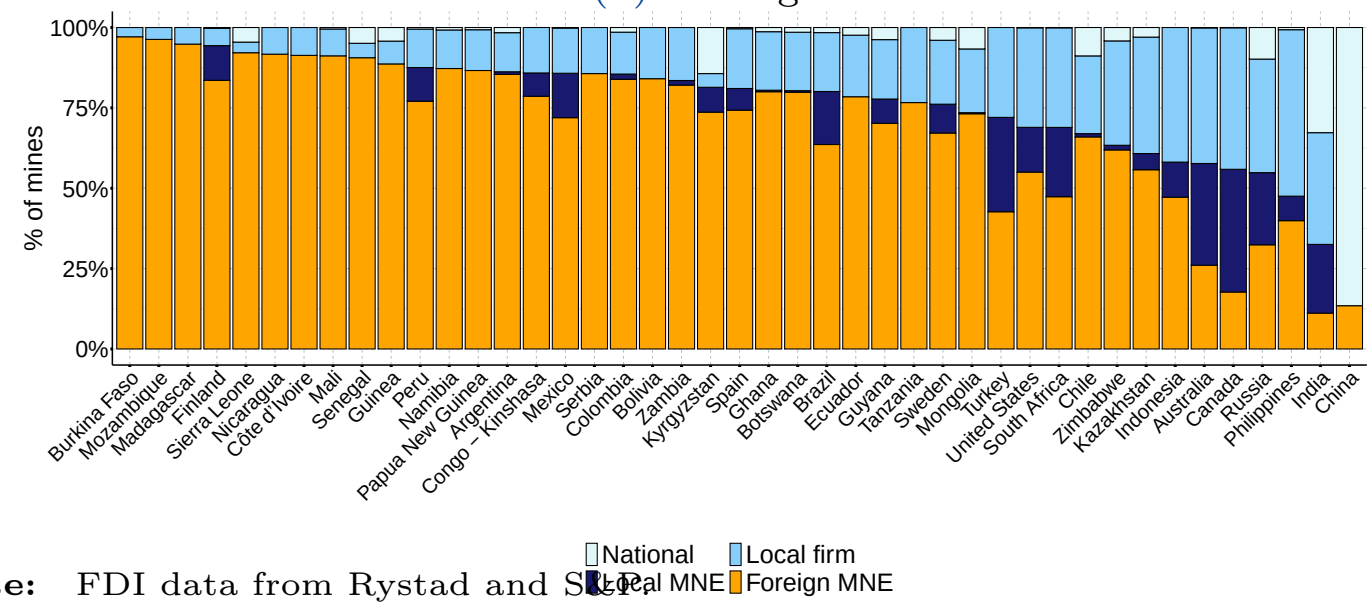
  → State capacity determines the elasticity of fiscal windfalls.

Background: Extractives and Foreign Direct Investments

(a) Oil & gas

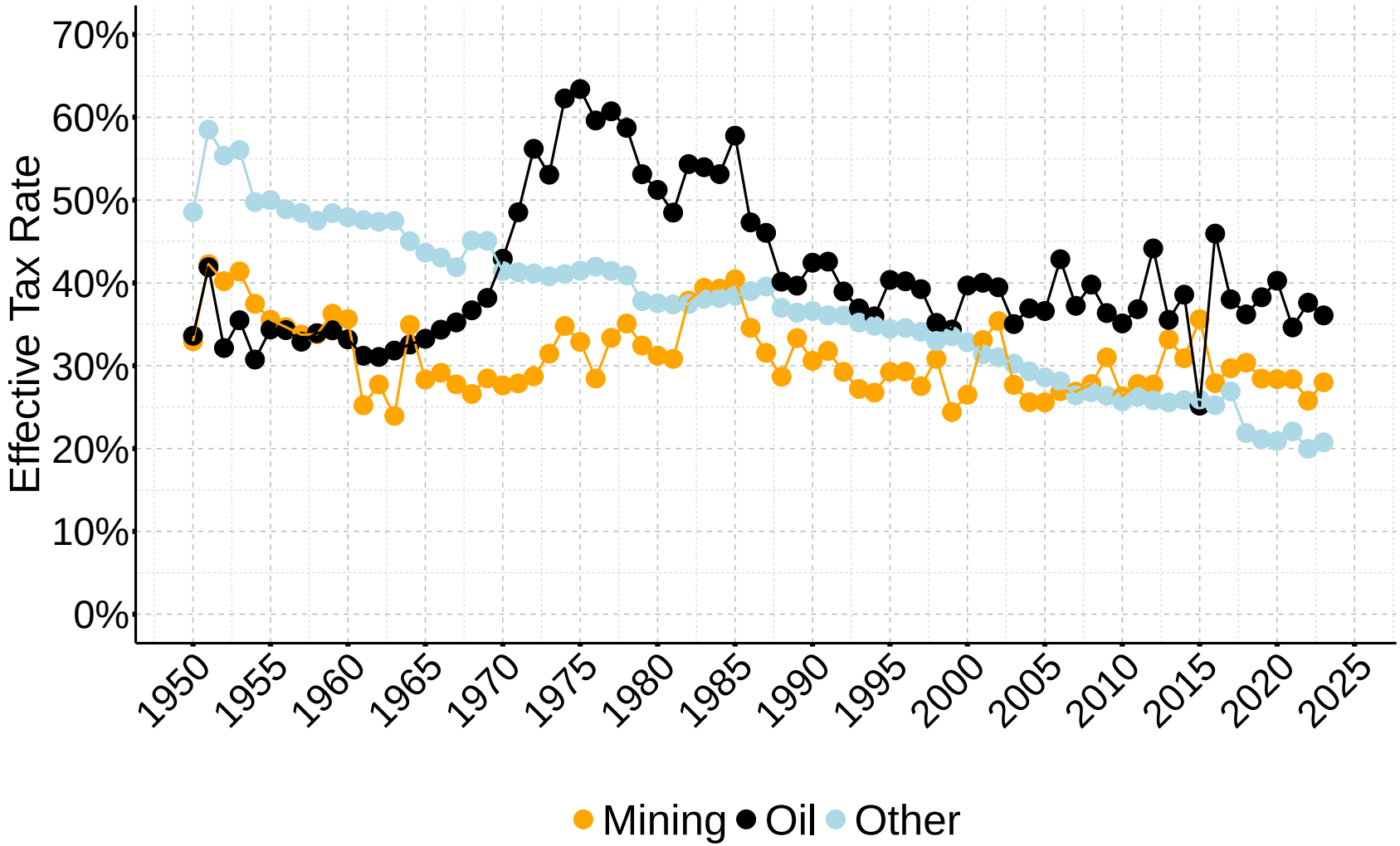


(b) Mining



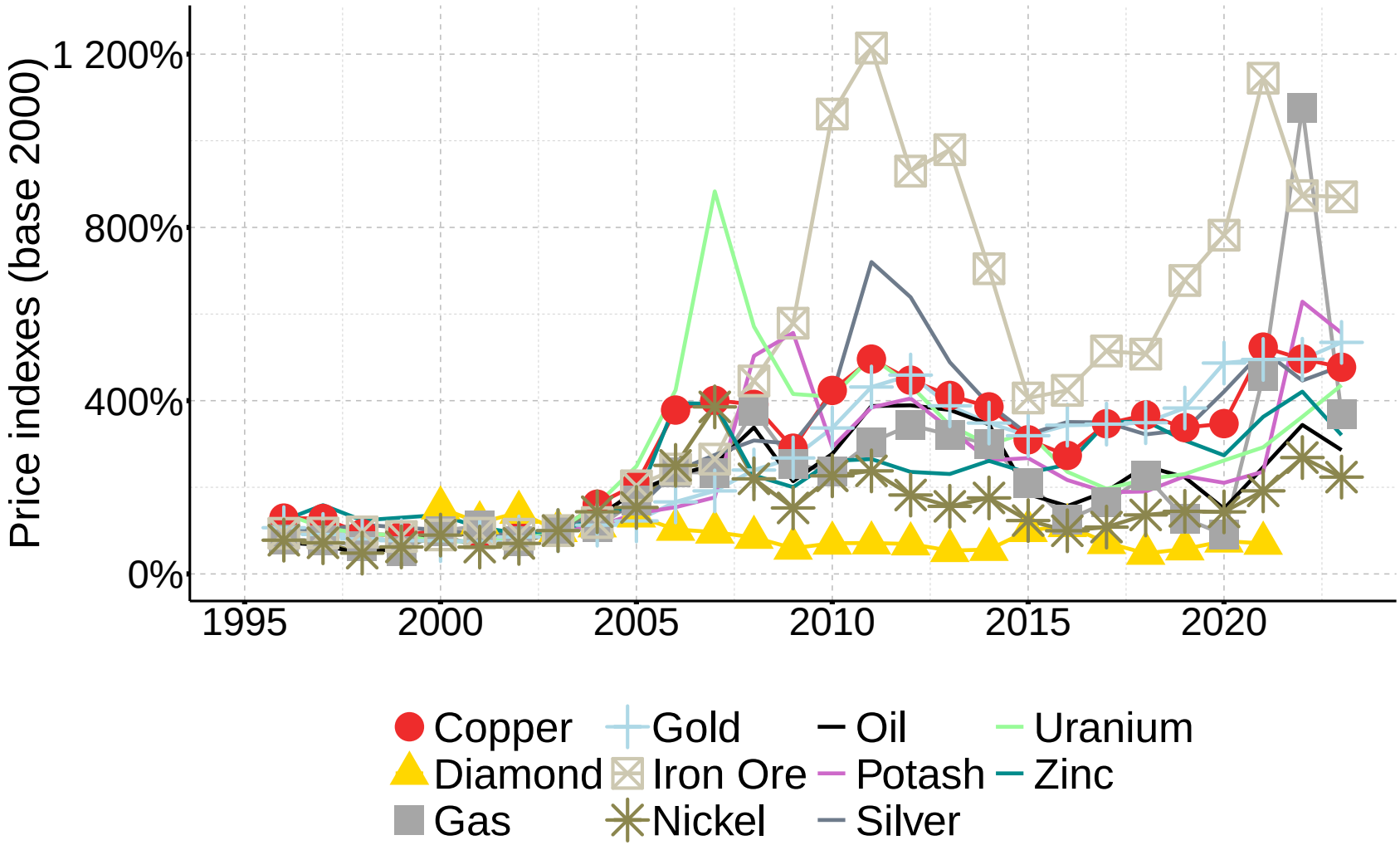
Note: FDI data from Rystad and S&P.

Background: Extractives & global taxation regime



Note: Series computed from Compustat Global.

Background: Market price fluctuations of extractive commodities



Note: Price data from IMF, USGS, Rystad.

Data sources

→ We use novel data available from transparency obligations for MNEs.

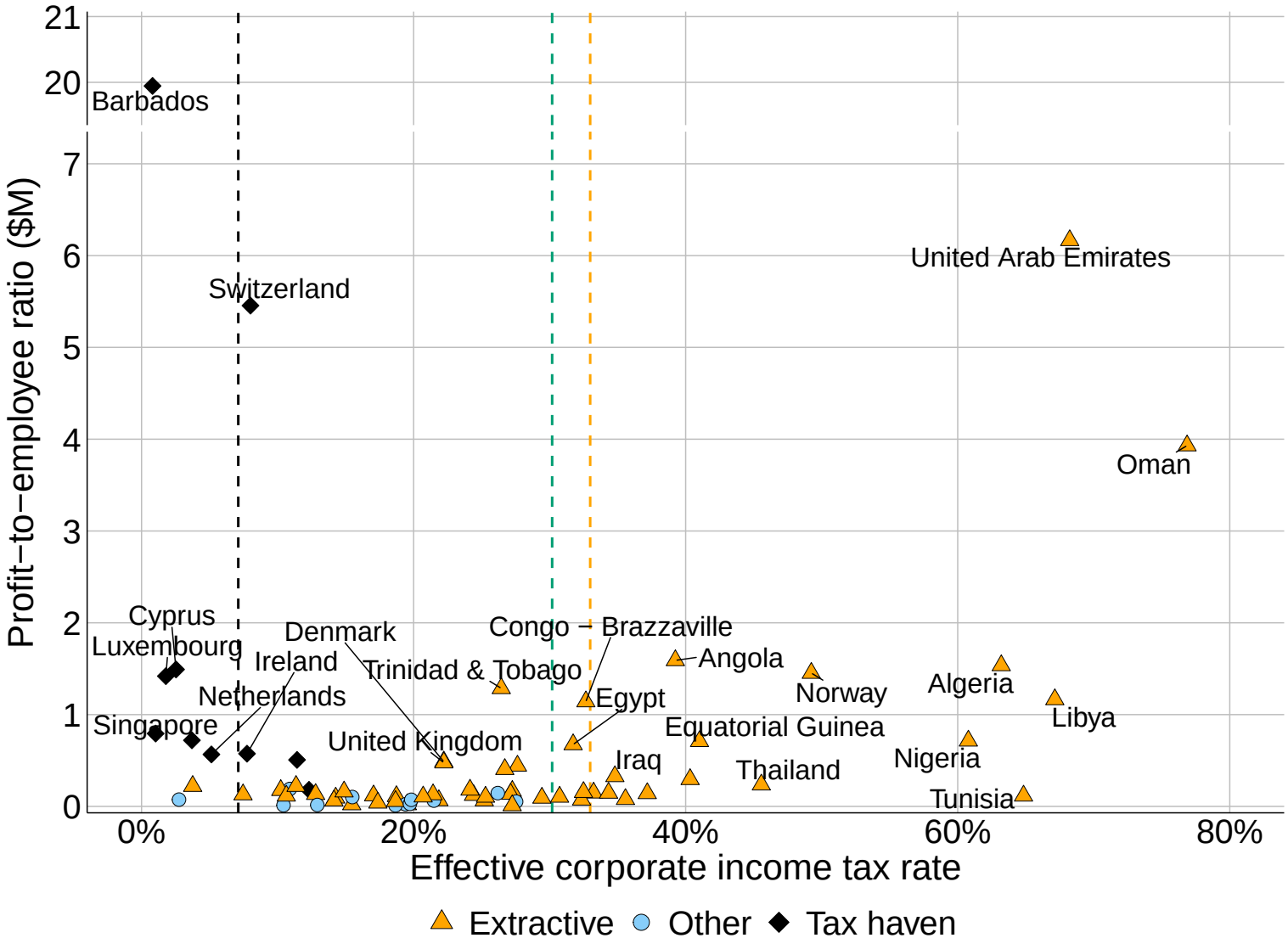
1. Country-by-Country Reports
   - Exhaustive information on MNEs profits, sales, employees, assets, etc. on a country-by-country basis.
   - 73 oil, gas and mining MNEs >750 million € revenues, 2016-2023.

2. Project-by-Project Reports
   - Extractive firms listed in EU, Canada, Norway and UK (US since 2023).
   - 2016 to 2023.
   - Reporting of all payments >100K$, by project and tax.

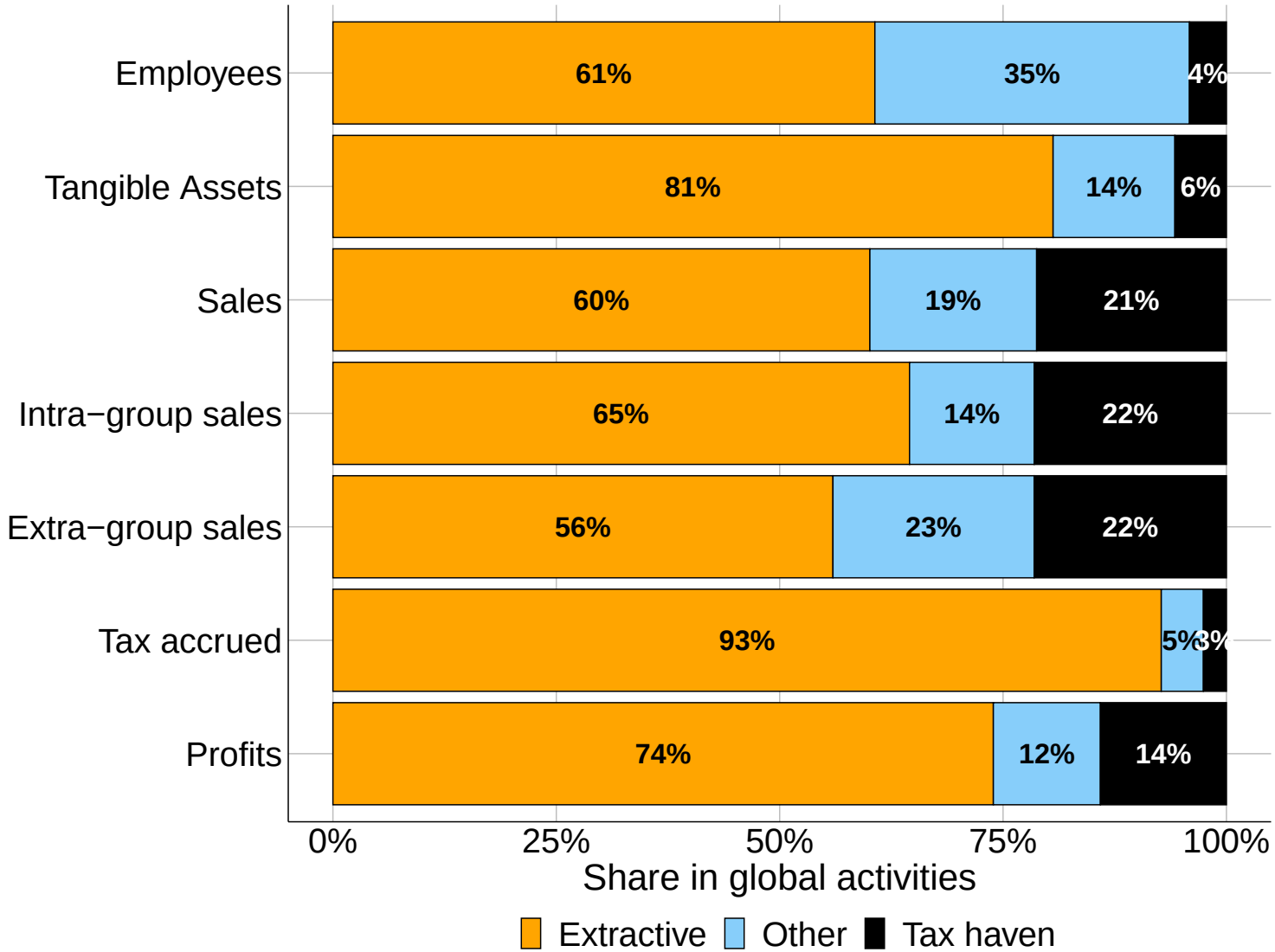
Complementary data:

- Oil, gas and mining production:
  - Rystad, S&P Mining and Metals (most exhaustive)
  - Info on MNE extractive activity.
- Extractive commodity market prices: IMF, USGS, Rystad

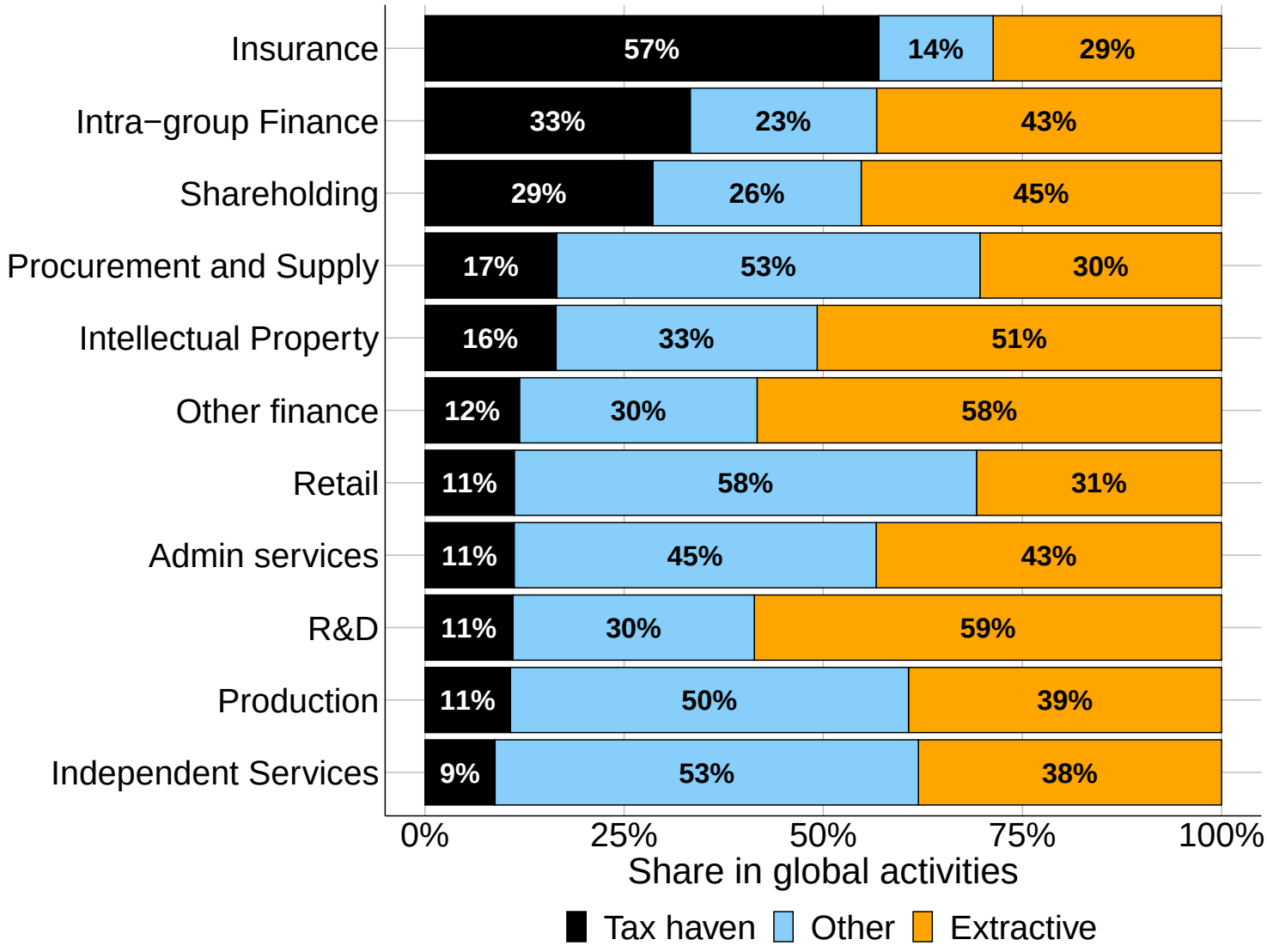
Descriptive evidence - Effective tax rates



Descriptive evidence - Distribution of activity



Descriptive evidence - Sectoral composition



MNE windfalls

We compute MNEs product specialization (pre 2016)

→ Associated with a large increase in consolidated profits and sales.

Within a MNE, we compare how different types of affiliates react to price changes

→ Triple difference-in-difference.

- *First difference*: between MNEs affected by different shocks
- *Second difference*: within the MNE, between types of affiliates:
  - ... Extractive, refining, tax haven affiliates (treatment)
  - ... to the rest of the affiliates in the MNE (control).

$$\begin{aligned} y_{g,i,t} =& \alpha + \beta_H logP_{g,t} \times Haven_i + \beta_M logP_{g,t} \times Extract_s + \beta_m logP_{g,t} \\ &+ \theta' Controls_{g,i,t} + \mu_{g,i} + \mu_t + \varepsilon_{g,t} \end{aligned} \tag{1}$$

i country, g MNE, t year; $Price_{g,t}$: main commodity price; $Haven_i = 1$: i is a tax haven; $\mu_{g,t}, \mu_t$ country-MNE and year fixed effects.

Results - Profits

	Profits (log)				
	(1)	(2)	(3)	(4)	(5)
$logP_{g,t}$	0.648***	0.190	0.182		
	(0.226)	(0.239)	(0.239)		
$\text{Extract}_i \times logP_{g,t}$		1.45***	1.47***	1.53***	1.56***
		(0.266)	(0.278)	(0.254)	(0.267)
$\text{Haven}_i \times logP_{g,t}$		0.528**	0.558**	0.711***	0.751***
		(0.256)	(0.266)	(0.213)	(0.221)
$\text{Haven}_i \times \text{Extract}_i \times logP_{g,t}$			-0.651		-0.842
			(0.547)		(0.572)
$\text{Employees}_{g,i,t}$	0.230***	0.226***	0.226***	0.237***	0.237***
	(0.067)	(0.068)	(0.068)	(0.061)	(0.061)
$\text{Tang Assets}_{g,i,t}$	0.066**	0.069**	0.069**	0.045***	0.045***
	(0.032)	(0.032)	(0.032)	(0.016)	(0.016)
Observations	5,209	5,209	5,209	5,209	5,209
R^2	0.92796	0.92922	0.92923	0.94101	0.94103
Within R^2	0.06043	0.07690	0.07700	0.06470	0.06490
MNE-Country fixed effects	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓		
MNE-Year fixed effects				✓	✓

→ Profits in TH affiliates increase by 0.5-0.7 pp more than in the rest of the non-extractive affiliates.

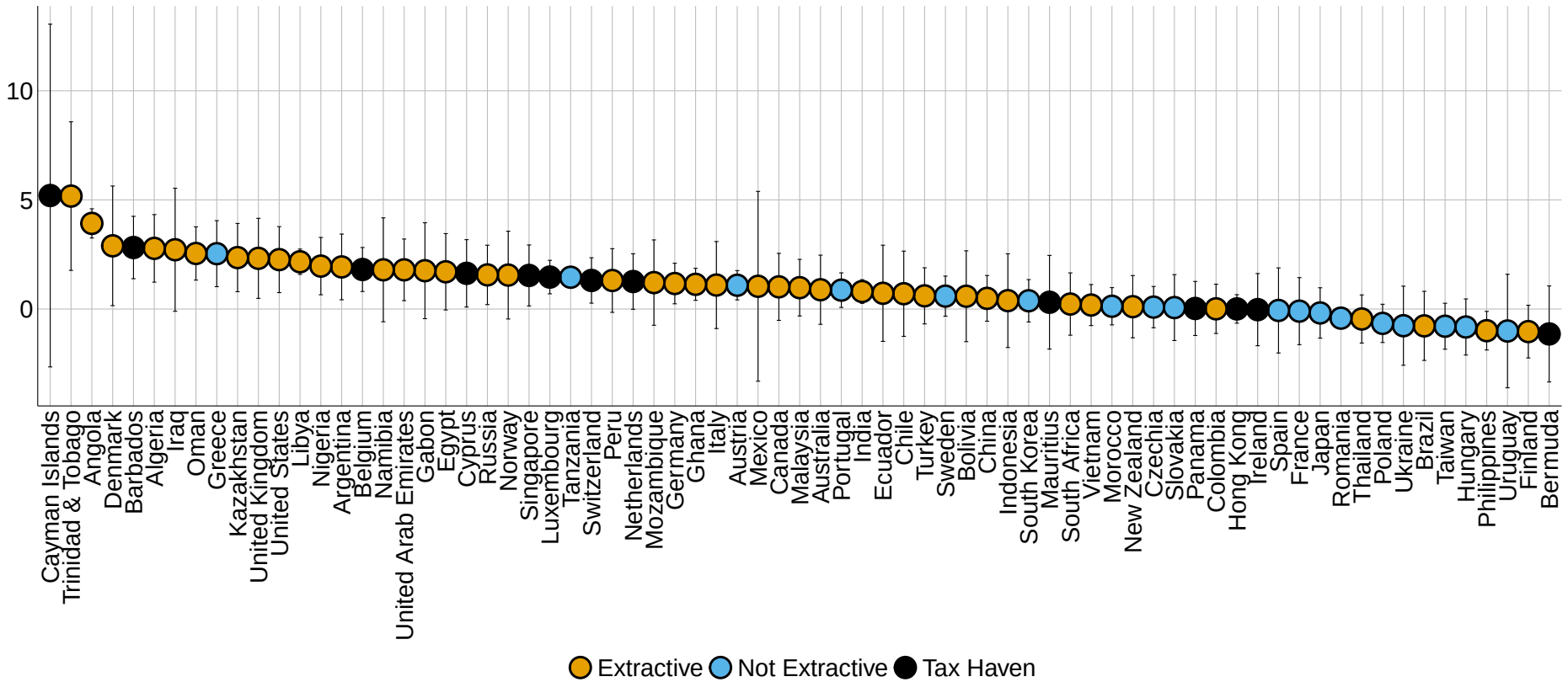
Results - Profits

	Profits (log)				
	(1)	(2)	(3)	(4)	(5)
$logP_{g,t}$	0.648***	0.190	0.182		
	(0.226)	(0.239)	(0.239)		
$\text{Extract}_i \times logP_{g,t}$		1.45***	1.47***	1.53***	1.56***
		(0.266)	(0.278)	(0.254)	(0.267)
$\text{Haven}_i \times logP_{g,t}$		0.528**	0.558**	0.711***	0.751***
		(0.256)	(0.266)	(0.213)	(0.221)
$\text{Haven}_i \times \text{Extract}_i \times logP_{g,t}$			-0.651		-0.842
			(0.547)		(0.572)
$\text{Employees}_{g,i,t}$ (IHS)	0.230***	0.226***	0.226***	0.237***	0.237***
	(0.067)	(0.068)	(0.068)	(0.061)	(0.061)
$\text{Tang Assets}_{g,i,t}$ (IHS)	0.066**	0.069**	0.069**	0.045***	0.045***
	(0.032)	(0.032)	(0.032)	(0.016)	(0.016)
Observations	5,209	5,209	5,209	5,209	5,209
R^2	0.92796	0.92922	0.92923	0.94101	0.94103
Within R^2	0.06043	0.07690	0.07700	0.06470	0.06490
MNE-Country fixed effects	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓		
MNE-Year fixed effects				✓	✓

→ Profits in TH affiliates increase by 0.5-0.7 pp more than in the rest of the non-extractive affiliates.

Results - Profits

$$y_{g,i,t} = \alpha + \beta_i log P_{g,t} + \theta' Controls_{g,i,t} + \mu_{g,i} + \mu_{g,t} + \varepsilon_{g,t} \qquad (2)$$



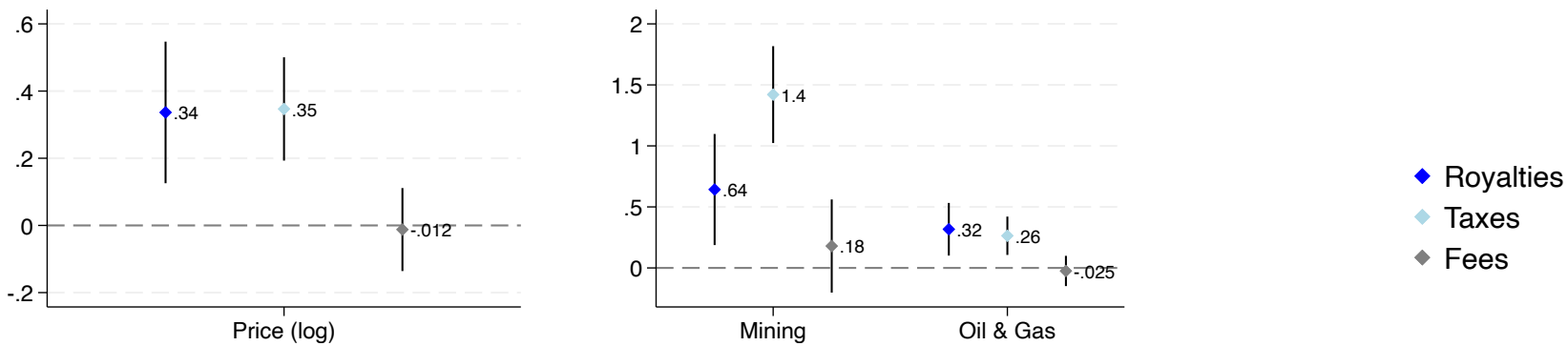
Fiscal windfalls: project payment

Do these price changes translate in fiscal windfalls at the mine or field?

We find that a 1% price increase:

- Translate in 0.326 and 0.959% increase in total payment for oil & gas and mining.

- By type of tax:



- Good state capacity increase this price elasticity.

Conclusion

1. Extractive sector faces high price volatility, potential generating windfalls for states and MNEs.
2. An increase in extractive prices leads to:
   - Higher profitability of tax havens affiliates.

   → *We interpret as sign of profit shifting.*
   - Small effects on distribution and refining affiliates
3. Effect of state capacity on fiscal windfalls:
   - Next step to understand if it is due to:
     - Different choice of tax regime
     - Lower detection of windfall shifting

Summary statistics

Year	**MNEs** (Nb)	**Countries** (Nb)	**MNE×Country** (th)	**Sales** ($bn)	**Profits** ($bn)	**Employees** (th)
2016	38	194.0	1.7	1,465.1	-5.0	1,559.2
2017	46	198.0	2.0	1,885.5	145.8	2,023.7
2018	39	196.0	1.7	1,915.5	211.1	1,704.7
2019	46	189.0	1.8	1,930.2	117.7	1,727.9
2020	22	171.0	0.8	692.9	-39.4	755.4
2021	24	168.0	0.8	994.6	221.0	760.1
2022	22	167.0	0.8	1,254.3	286.2	714.3
2023	19	151.0	0.7	1,070.6	223.0	691.7
2016-2023	73	198	1.3	1,401.1	145.0	1,242.1

Back

Summary statistics by country

	Profits		Taxes		Sales		Employees		MNEs	
	($bn)	(%)	($bn)	(%)	($bn)	(%)	(th)	(%)	(Nb)	(%)
Australia	234.6	23.2	68.4	17.6	815.6	3.6	624.4	6.8	55	2.7
Norway	205.4	20.3	103.4	26.6	610.7	2.7	158.0	1.7	36	1.7
United Arab Emirates	55.1	5.4	43.2	11.1	335.3	1.5	13.7	0.1	27	1.3
Singapore	48.5	4.8	1.8	0.5	2,306.8	10.3	94.0	1.0	52	2.5
Switzerland	47.9	4.7	3.7	1.0	1,061.4	4.7	18.2	0.2	38	1.8
Colombia	43.5	4.3	11.7	3.0	136.1	0.6	113.2	1.2	30	1.4
Chile	37.5	3.7	6.5	1.7	119.0	0.5	209.0	2.3	27	1.3
Nigeria	35.8	3.5	22.8	5.9	125.9	0.6	67.6	0.7	19	0.9
United States	35.0	3.5	-1.7	-0.4	4,604.4	20.5	1,151.4	12.5	61	2.9
South Africa	31.9	3.1	5.6	1.4	274.3	1.2	529.6	5.7	36	1.7
Netherlands	29.8	2.9	4.9	1.2	1,032.6	4.6	165.9	1.8	56	2.7
Malaysia	28.6	2.8	7.6	2.0	184.0	0.8	184.1	2.0	33	1.6
Spain	24.8	2.4	4.0	1.0	1,046.4	4.7	275.3	3.0	36	1.7
Kazakhstan	19.6	1.9	3.6	0.9	64.5	0.3	228.6	2.5	20	1.0
Denmark	17.7	1.7	4.5	1.2	122.6	0.5	53.6	0.6	27	1.3
Egypt	16.3	1.6	6.8	1.7	67.6	0.3	30.6	0.3	18	0.9
Thailand	14.2	1.4	5.2	1.3	124.7	0.6	61.3	0.7	27	1.3
Belgium	12.4	1.2	1.6	0.4	530.3	2.4	186.8	2.0	37	1.8
Indonesia	12.3	1.2	5.5	1.4	58.5	0.3	65.0	0.7	36	1.7
China	11.1	1.1	2.0	0.5	146.8	0.7	165.5	1.8	47	2.3
Japan	10.5	1.0	2.5	0.6	343.3	1.5	539.0	5.8	41	2.0
Germany	8.7	0.9	6.1	1.6	1,046.3	4.7	308.7	3.3	46	2.2
United Kingdom	8.2	0.8	20.4	5.2	2,616.9	11.6	457.3	5.0	56	2.7
Bermuda	5.7	0.6	0.2	0.0	19.1	0.1	0.2	0.0	26	1.3
World	1,160.4	100.0	472.4	100.0	23,678.1	100.0	9,937.0	100.0	73	100.0

Back

Coverage of CBCR

Year	Oil Production			Mining Production			Global Profits		
	Sample ($bn)	World ($bn)	Share (%)	Sample ($bn)	World ($bn)	Share (%)	Sample ($bn)	World ($bn)	Share (%)
2016	261.3	764.7	34.2	66.3	120.1	55.2	35.7	68.9	51.8
2017	364.5	951.0	38.3	105.5	143.2	73.7	134.9	343.0	39.3
2018	430.4	1,219.1	35.3	117.7	157.5	74.7	194.8	482.2	40.4
2019	339.6	1,140.1	29.8	134.1	136.7	98.1	95.9	281.3	34.1
2020	152.3	754.1	20.2	76.0	143.5	53.0	-38.9	-155.3	25.0
2021	267.3	1,333.2	20.0	123.5	198.4	62.2	212.4	734.0	28.9
2022	401.8	1,994.6	20.1	98.2	176.4	55.7	322.1	1,067.3	30.2
2023	275.6	1,504.3	18.3	85.8	155.0	55.4	188.9	752.4	25.1
2016-2023	311.6	1,207.6	27.0	100.9	153.8	66.0	143.2	446.7	34.4

Sources: Rystad Upstream for oil & gas production, S&P Metals and Mining for mining production, Compustat Northam and Global for global profits.
Lecture: In 2016, MNEs in our sample produced around $261.3bn worth of oil, gas & NGL, which makes up 34.2% of global production.
Notes: Since our sample excludes corporations specialized in coal and large state-owned corporations, we excluded them from our benchmarks.

Back

Correction of double counting

Year	MNEs (Nb)	Intra-Group Dividends ($bn)	Uncorrected Profits ($bn)	Corrected Profits ($bn)	Dividends/Uncorrected Profits (%)
2016	7	39.4	343.5	-50.3	11.5
2017	15	44.6	1,904.4	1,458.3	2.3
2018	11	67.4	2,785.1	2,110.8	2.4
2019	8	48.1	1,657.9	1,177.0	2.9
2020	0	0.0	-393.6	-393.6	0.0
2021	0	0.0	2,241.7	2,241.7	0.0
2022	0	0.0	2,861.7	2,861.7	0.0
2023	0	0.0	2,230.2	2,230.2	0.0

Lecture: In 2016, 7 MNEs double counted their intra-group dividends. Intra-group dividends represented $39.4bn in total, or 11.5% of total reported profits.

Back

Additional Result - Gains versus Losses

	Profits (IHS)		Profits (log)	|Losses| (log)
	(1)	(2)	(3)	(4)
$\text{Extract}_f \times \text{P}_{g,t}$	13.7***	7.96***	1.56***	-0.512*
	(2.42)	(1.32)	(0.267)	(0.260)
Haven $\times \text{P}_{g,t}$	2.39		0.751***	0.141
	(2.48)		(0.221)	(0.525)
Non Haven $\times$ Losses $\times \text{P}_{g,t}$		-2.44***		
		(0.304)		
Non Haven $\times$ Gains $\times \text{P}_{g,t}$		1.69***		
		(0.470)		
Haven $\times$ Losses $\times \text{P}_{g,t}$		-0.338		
		(1.17)		
Haven $\times$ Gains $\times \text{P}_{g,t}$		3.51***		
		(1.16)		
Haven $\times \text{Extract}_f \times \text{P}_{g,t}$	-6.26	-5.67	-0.842	-2.36
	(11.9)	(6.82)	(0.572)	(2.73)
Employees (IHS)	0.619***	-0.063	0.237***	0.381***
	(0.211)	(0.219)	(0.061)	(0.076)
Tang Assets (IHS)	-0.029	-0.089**	0.045***	0.040***
	(0.056)	(0.037)	(0.016)	(0.015)
Observations	9,242	9,242	5,209	3,416
R^2	0.63071	0.87105	0.94103	0.89936
Within R^2	0.01560	0.65627	0.06490	0.08116
MNE-Country fixed effects	✓	✓	✓	✓
MNE-Year fixed effects	✓	✓	✓	✓

Back

Additional Result - Taxes

	Taxes accrued (log)				
	(1)	(2)	(3)	(4)	(5)
$P_{g,t}$	0.520**	0.039	0.050		
	(0.199)	(0.221)	(0.225)		
$Extract_f \times P_{g,t}$		1.15***	1.13***	1.09***	1.07***
		(0.224)	(0.237)	(0.266)	(0.278)
$Haven \times P_{g,t}$		0.658**	0.613**	0.685**	0.646**
		(0.261)	(0.284)	(0.276)	(0.300)
$Haven \times Extract_f \times P_{g,t}$			1.18		1.00
			(1.39)		(1.26)
Employees (IHS)	0.129*	0.124*	0.125*	0.163**	0.163**
	(0.070)	(0.069)	(0.069)	(0.073)	(0.073)
Tang Assets (IHS)	0.049*	0.051*	0.051*	0.030**	0.030**
	(0.026)	(0.026)	(0.026)	(0.014)	(0.014)
Observations	4,882	4,882	4,882	4,882	4,882
R^2	0.91303	0.91395	0.91397	0.92403	0.92404
Within R^2	0.02302	0.03334	0.03354	0.02611	0.02628
MNE-Country fixed effects	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓		
MNE-Year fixed effects				✓	✓

Back

Additional Result - Total Sales

	Sales (log)				
	(1)	(2)	(3)	(4)	(5)
$P_{g,t}$	0.358*	0.248	0.231		
	(0.206)	(0.223)	(0.218)		
$Extract_f \times P_{g,t}$		0.283	0.324*	0.157	0.205
		(0.192)	(0.194)	(0.197)	(0.194)
$Haven \times P_{g,t}$		0.159	0.231	0.073	0.153
		(0.161)	(0.173)	(0.166)	(0.173)
$Haven \times Extract_f \times P_{g,t}$			-1.40		-1.50*
			(0.900)		(0.859)
Employees (IHS)	0.438***	0.438***	0.438***	0.410***	0.409***
	(0.106)	(0.106)	(0.106)	(0.112)	(0.111)
Tang Assets (IHS)	0.076***	0.076***	0.076***	0.064***	0.063***
	(0.028)	(0.028)	(0.029)	(0.021)	(0.021)
Observations	7,670	7,670	7,670	7,670	7,670
R^2	0.93089	0.93094	0.93097	0.93960	0.93964
Within R^2	0.13366	0.13421	0.13458	0.11431	0.11480
MNE-Country fixed effects	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓		
MNE-Year fixed effects				✓	✓

Back

Additional Result - Intra-group Sales

	Intra-Group Sales (log)				
	(1)	(2)	(3)	(4)	(5)
$P_{g,t}$	0.427*	0.226	0.216		
	(0.224)	(0.302)	(0.299)		
$Extract_f \times P_{g,t}$		0.500*	0.523*	0.510*	0.534*
		(0.268)	(0.272)	(0.291)	(0.294)
$Haven \times P_{g,t}$		0.244	0.282	0.196	0.236
		(0.380)	(0.366)	(0.383)	(0.371)
$Haven \times Extract_f \times P_{g,t}$			-0.666		-0.663
			(0.709)		(0.729)
Employees (IHS)	0.382***	0.381***	0.380***	0.366***	0.365***
	(0.122)	(0.124)	(0.123)	(0.130)	(0.129)
Tang Assets (IHS)	0.044*	0.045*	0.045*	0.035*	0.035*
	(0.024)	(0.024)	(0.024)	(0.018)	(0.018)
Observations	6,125	6,125	6,125	6,125	6,125
R^2	0.92701	0.92716	0.92717	0.93501	0.93502
Within R^2	0.07581	0.07766	0.07777	0.06490	0.06502
MNE-Country fixed effects	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓		
MNE-Year fixed effects				✓	✓

Back

Additional Result - Extra-group Sales

	Extra-Group Sales (log)				
	(1)	(2)	(3)	(4)	(5)
$P_{g,t}$	0.140	0.040	0.037		
	(0.231)	(0.251)	(0.255)		
$Extract_f \times P_{g,t}$		0.304*	0.312*	0.247	0.256
		(0.173)	(0.183)	(0.178)	(0.188)
$Haven \times P_{g,t}$		-0.005	0.010	-0.124	-0.107
		(0.275)	(0.291)	(0.287)	(0.305)
$Haven \times Extract_f \times P_{g,t}$			-0.266		-0.282
			(0.717)		(0.580)
Employees (IHS)	0.436***	0.436***	0.436***	0.391***	0.391***
	(0.117)	(0.118)	(0.118)	(0.112)	(0.112)
Tang Assets (IHS)	0.096***	0.096***	0.096***	0.083***	0.083***
	(0.032)	(0.032)	(0.032)	(0.023)	(0.023)
Observations	6,891	6,891	6,891	6,891	6,891
R^2	0.93256	0.93260	0.93260	0.94081	0.94081
Within R^2	0.13016	0.13071	0.13073	0.10746	0.10747
MNE-Country fixed effects	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓		
MNE-Year fixed effects				✓	✓

Back

Robustness - MNE level, Orbis data

	Profit (log)				Sales (log)	
	(1)	(2)	(3)	(4)	(5)	(6)
Subsample:	All	Mining	Oil & gas		All	
$\text{Price}_{g,t}$	1.20***	1.08***	1.76***	1.07***	0.375***	0.356***
	(0.186)	(0.260)	(0.490)	(0.266)	(0.119)	(0.124)
$\text{Assets}_{g,t}$				0.607***		0.542***
				(0.143)		(0.077)
$\text{Employees}_{g,t}$				0.132		0.401***
				(0.124)		(0.118)
Observations	2,336	1,325	1,011	1,367	4,107	2,152
R^2	0.85763	0.83645	0.86957	0.87462	0.91718	0.95596
Within R^2	0.03694	0.02865	0.01943	0.13082	0.00396	0.32603
Year fixed effects	✓	✓	✓	✓	✓	✓
Group fixed effects	✓	✓	✓	✓	✓	✓

Back

Robustness - MNE level, Orbis data

	Profits (log)				
	(1)	(2)	(3)	(4)	(5)
$P_{g,t}$	0.663***	0.253	0.241		
	(0.223)	(0.251)	(0.250)		
$Extract_f \times P_{g,t}$		1.38***	1.41***	1.43***	1.46***
		(0.266)	(0.275)	(0.257)	(0.268)
$Haven \times P_{g,t}$		0.420*	0.471**	0.532**	0.580**
		(0.238)	(0.235)	(0.225)	(0.225)
$Haven \times Extract_f \times P_{g,t}$			-0.982*		-0.885*
			(0.507)		(0.517)
Employees (IHS)	0.242***	0.240***	0.240***	0.249***	0.249***
	(0.069)	(0.070)	(0.070)	(0.062)	(0.062)
Tang Assets (IHS)	0.072**	0.076**	0.076**	0.050***	0.050***
	(0.032)	(0.032)	(0.032)	(0.017)	(0.017)
Observations	5,237	5,237	5,237	5,237	5,237
R^2	0.92724	0.92844	0.92846	0.94033	0.94035
Within R^2	0.06875	0.08411	0.08438	0.06815	0.06841
MNE-Country fixed effects	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓		
MNE-Year fixed effects				✓	✓

Robustness - Weighted price index

	Profits				
	(1)	(2)	(3)	(4)	(5)
$P_{g,t}$	0.992***	-0.198	-0.661		
	(0.218)	(0.474)	(0.410)		
$Extract_f \times P_{g,t}$		1.30***	1.78***	1.18***	1.80***
		(0.431)	(0.429)	(0.332)	(0.251)
$Haven \times P_{g,t}$		1.18*	1.84***	0.828	1.61***
		(0.651)	(0.488)	(0.613)	(0.341)
$Haven \times Extract_f \times P_{g,t}$			-2.66***		-2.99***
			(0.684)		(0.636)
Employees (IHS)	-0.034	-0.037	-0.040	0.026	0.024
	(0.038)	(0.039)	(0.038)	(0.081)	(0.080)
Tang Assets (IHS)	0.072**	0.073**	0.074**	0.053**	0.054**
	(0.032)	(0.032)	(0.032)	(0.022)	(0.022)
Observations	5,389	5,389	5,389	5,389	5,389
Squared Correlation	0.83586	0.83470	0.83541	0.97211	0.97356
Pseudo R^2	0.93773	0.93899	0.93976	0.95970	0.96061
BIC	4.04×10^{11}	3.96×10^{11}	3.91×10^{11}	2.62×10^{11}	2.56×10^{11}
MNE-Country fixed effects	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓		
MNE-Year fixed effects				✓	✓

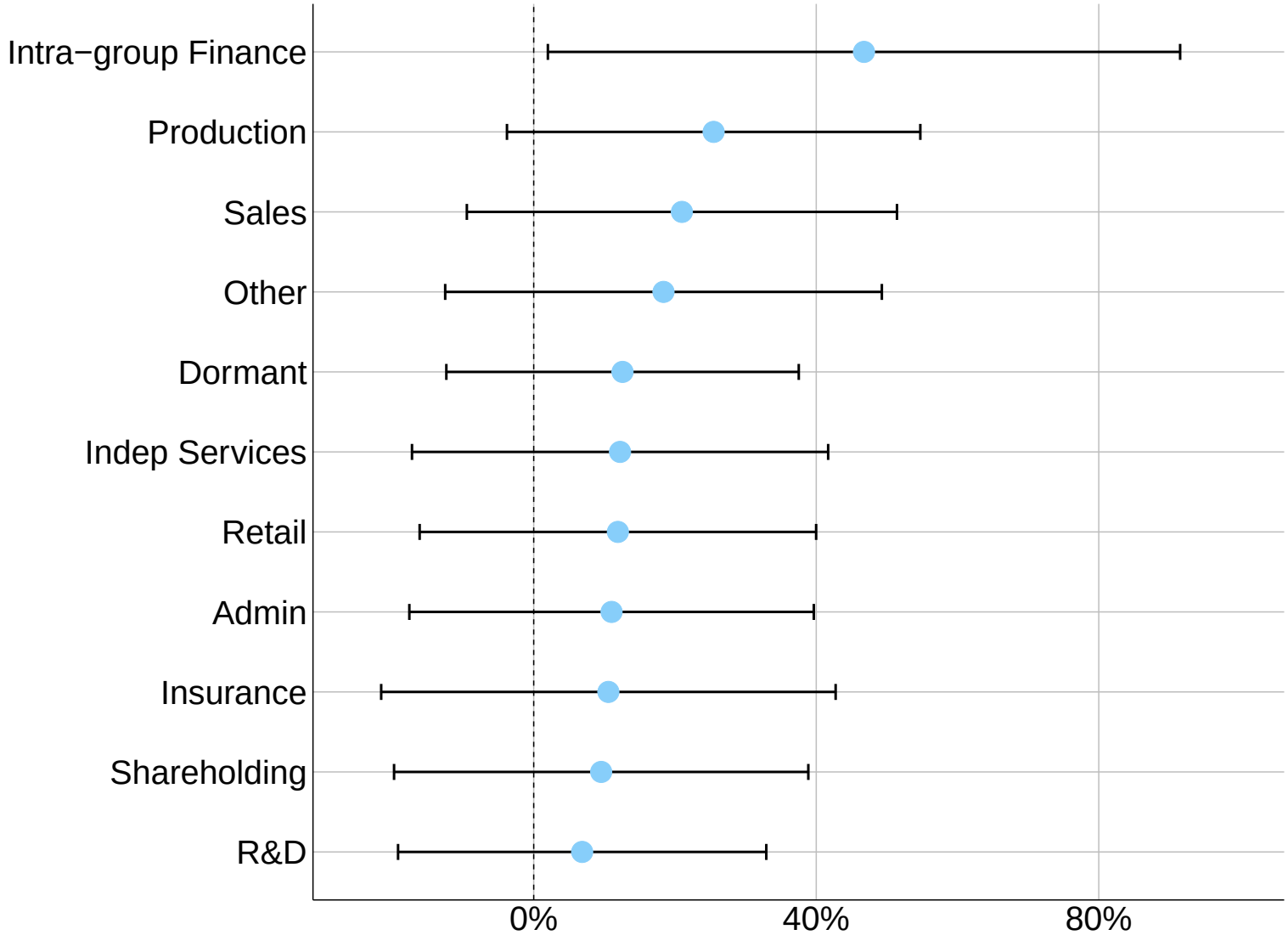
Back

Robustness - Winsorized outcome & balanced sample

	Winsorized Profits (log)		Balanced Sample Profits (log)	
	(1)	(2)	(3)	(4)
$P_{g,t}$	0.621***	0.160	0.522*	-0.066
	(0.228)	(0.243)	(0.275)	(0.286)
$Extract_f \times P_{g,t}$		1.46***		1.82***
		(0.262)		(0.334)
$Haven \times P_{g,t}$		0.526**		0.971**
		(0.257)		(0.366)
Employees (IHS)	0.232***	0.228***	0.312***	0.306***
	(0.067)	(0.067)	(0.066)	(0.070)
Tang Assets (IHS)	0.066**	0.068**	0.002	0.004
	(0.032)	(0.032)	(0.025)	(0.026)
Observations	5,209	5,209	2,787	2,787
R^2	0.92778	0.92909	0.93569	0.93705
Within R^2	0.06087	0.07781	0.04736	0.06744
MNE-Country fixed effects	✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓

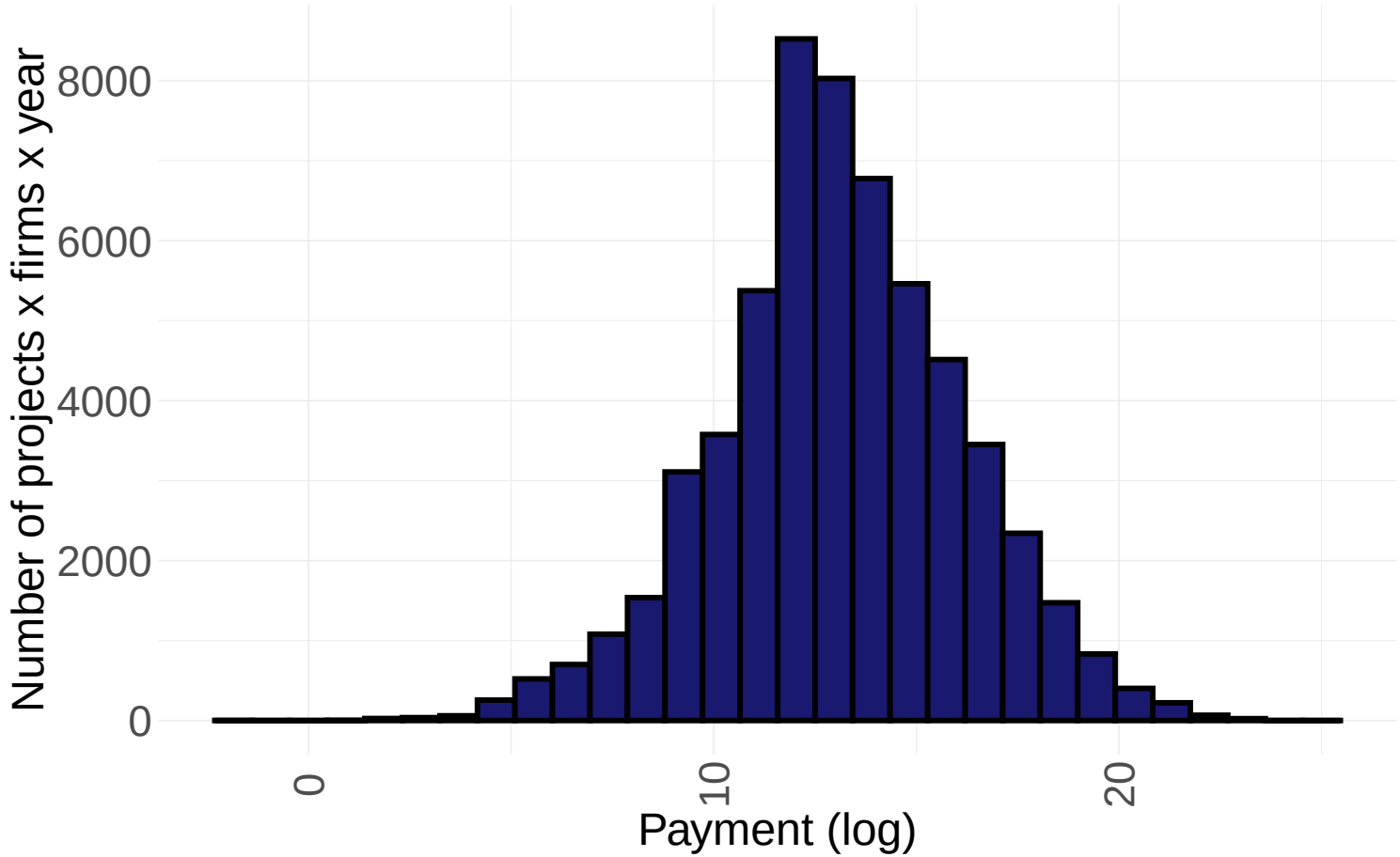
Back

Price elasticity and business activities



Back

Log distribution of payments (project level)



Note: Source: CBCR data.

▸ Data

Price elasticity of revenues - Results (all payments, project level)

Dep. Var.	Payment (log)			
	(1)	(2)	(3)	(4)
Price (log)	0.425***	0.431***		
	(0.135)	(0.137)		
× Mining	Significant diff (pvalue = 0.022)		0.887**	0.884**
			(0.389)	(0.384)
× Oil & Gas			0.395***	0.401***
			(0.099)	(0.105)
GDP per cap. (log)	-0.225	-0.041	-0.204	-0.022
	(0.167)	(0.142)	(0.174)	(0.147)
Population (log)	-5.739*	-5.786*	-5.510	-5.569
	(3.182)	(3.155)	(3.297)	(3.264)
All controls	No	Yes	No	Yes
Project FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	8,883	8,883	8,883	8,883
Number of projects	2087	2087	2087	2087
R-squared	0.909	0.909	0.909	0.909

Note: Standard-errors clustered at the project × product level. Controls: GDP p.c. (log), Population (log), Statutory tax rate, Government effectiveness, Political Stability, Number of Conflicts.

Back

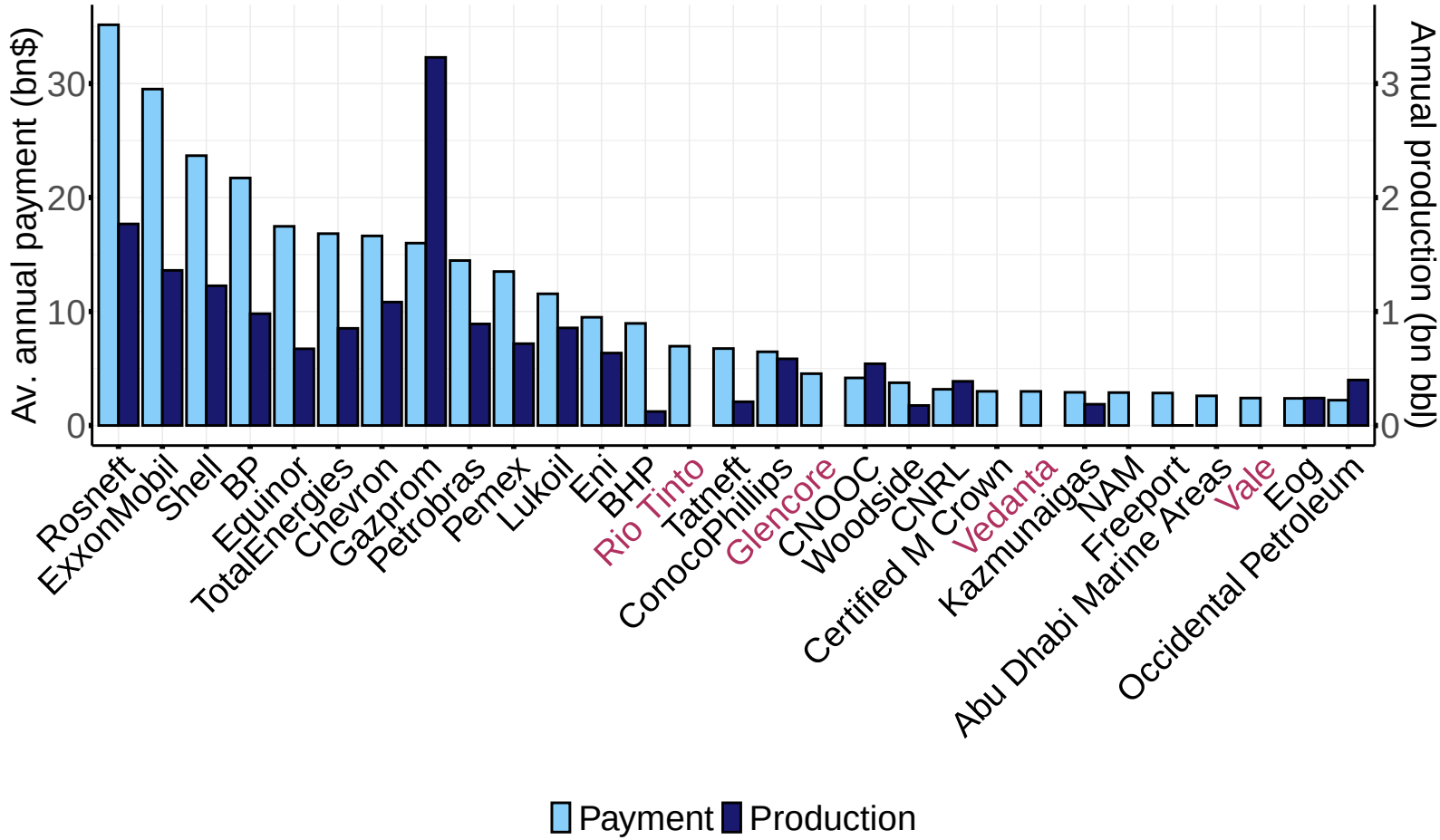
List of tax havens

From Tørsløv, Wier, and Zucman 2023:

- **Five OECD countries:** Belgium, Ireland, Luxembourg, Netherlands, and Switzerland.
- **36 non-OECD countries:** Andorra, Anguilla, Antigua and Barbuda, Aruba, The Bahamas, Bahrain, Barbados, Belize, Bermuda, the British Virgin Islands, the Cayman Islands, Curaçao, Cyprus, Gibraltar, Grenada, Guernsey, Hong Kong, the Isle of Man, Jersey, Lebanon, Liechtenstein, Macau, Malta, Marshall Islands, Mauritius, Monaco, Panama, Puerto Rico, Samoa, Seychelles, Singapore, St. Kitts and Nevis, St. Lucia, St. Marteen, St. Vincent & Grenadines, Turks and Caicos, Vanuatu.

▸ Motivation Estimation

Which firms ?



Note: Data source: UNU Wider GRD, extractive CBCR, Rystad & World Bank. Years 2016-2022. For the US, Australia & Canada, payments were estimated using Rystad & World Bank data. All the other payments come from UNU Wider.

▸ Share in total revenues

Summary Statistics - Extractive CBCR

Product	Nb. projects	Nb. firms	Av. payment (MUSD)	Median	Av. nb. years
Oil	2,019	353	110.21	5.94	3.67
Gold	712	234	17.20	2.14	3.94
Copper	281	119	32.77	2.05	4.01
Silver	261	124	17.10	1.63	4.49
Zinc	109	65	21.70	2.13	4.68
Gas	72	49	15.29	2.52	4.29
Uranium	55	12	14.66	2.56	4.18
Nickel	52	24	28.84	3.64	3.63
Iron	46	17	451.17	4.49	4.37

▸ Map

	Country	nb.Obs	nb.Firms	nb.Proj	Av.Payment ($M)	Med.Payment
1	Canada	7488	498	1746	20.43	0.91
2	United States	4267	224	1633	9.61	0.08
3	United Kingdom	2707	76	782	6.92	0.17
4	Mexico	1520	102	350	5.50	0.32
5	Australia	1079	56	314	124.15	0.33
6	Brazil	1034	64	334	37.26	0.35
7	Peru	975	66	308	8.88	0.16
8	Pakistan	857	10	251	3.16	0.11
9	Chile	786	60	198	21.93	0.20
10	Ecuador	730	22	185	1.77	0.05
11	France	650	22	180	2.70	0.62
12	Norway	608	34	225	237.31	1.13
13	Germany	580	32	200	5.74	0.52
14	Argentina	487	51	127	7.62	0.36
15	Colombia	479	41	119	24.99	1.68
16	Egypt	449	23	131	30.26	11.08
17	Kazakhstan	404	27	87	39.40	2.80
18	India	397	13	111	26.72	0.24
19	Angola	345	11	71	239.50	38.83
20	Netherlands	333	26	126	31.57	0.19
21	Total	34539	1052	9745	39.17	0.41

Back

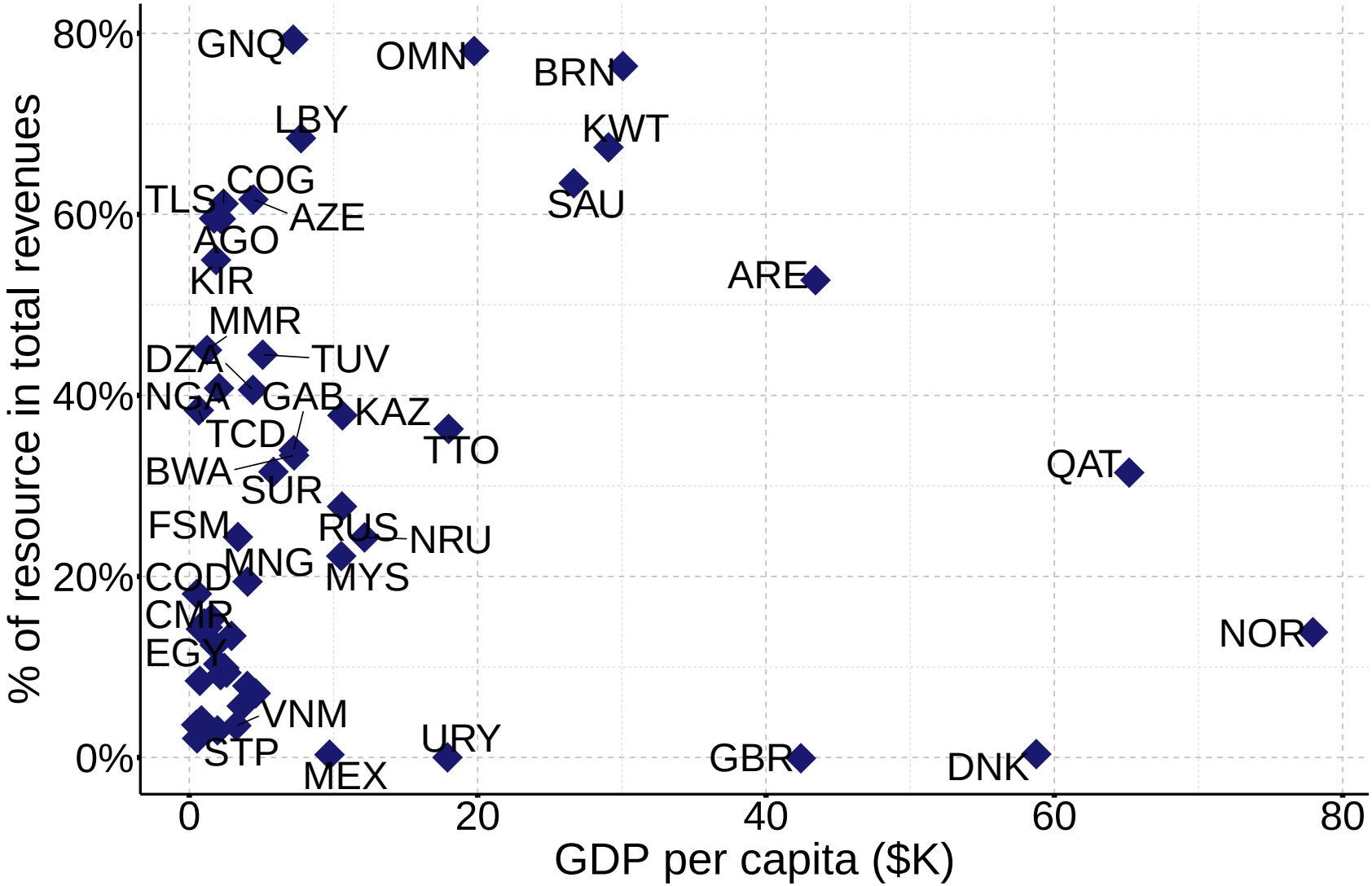
Prices and fiscal windfalls - Baseline elasticity

Dep. Var.	Payment (log)				
	(1)	(2)	(3)	(4)	(5)
Price (log)	0.568***	0.565***		0.510***	
	(0.059)	(0.060)		(0.069)	
× Mining			0.801***		0.964***
			(0.130)		(0.142)
× Oil			0.506***		0.357***
			(0.065)		(0.073)
Observations	11,159	11,159	11,159	11,159	11,159
Number of projects	2501	2501	2501	2501	2501
R-squared	0.903	0.903	0.903	0.905	0.906
Project FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Year FE				Yes	Yes

Note: Standard-errors clustered at the project level. Controls: GDP p.c. (log), Population (log), Statutory tax rate, Government effectiveness, Political Stability, Number of Conflicts.

Results CBCR

Extractive windfalls: revenues



Note: Data source: UNU Wider GRD, Rystad, World Bank, Hanson index of state capacity (Michigan). High/Low: Above/Below median.

Background: Tax system in the extractive sector

Two major types of taxes:

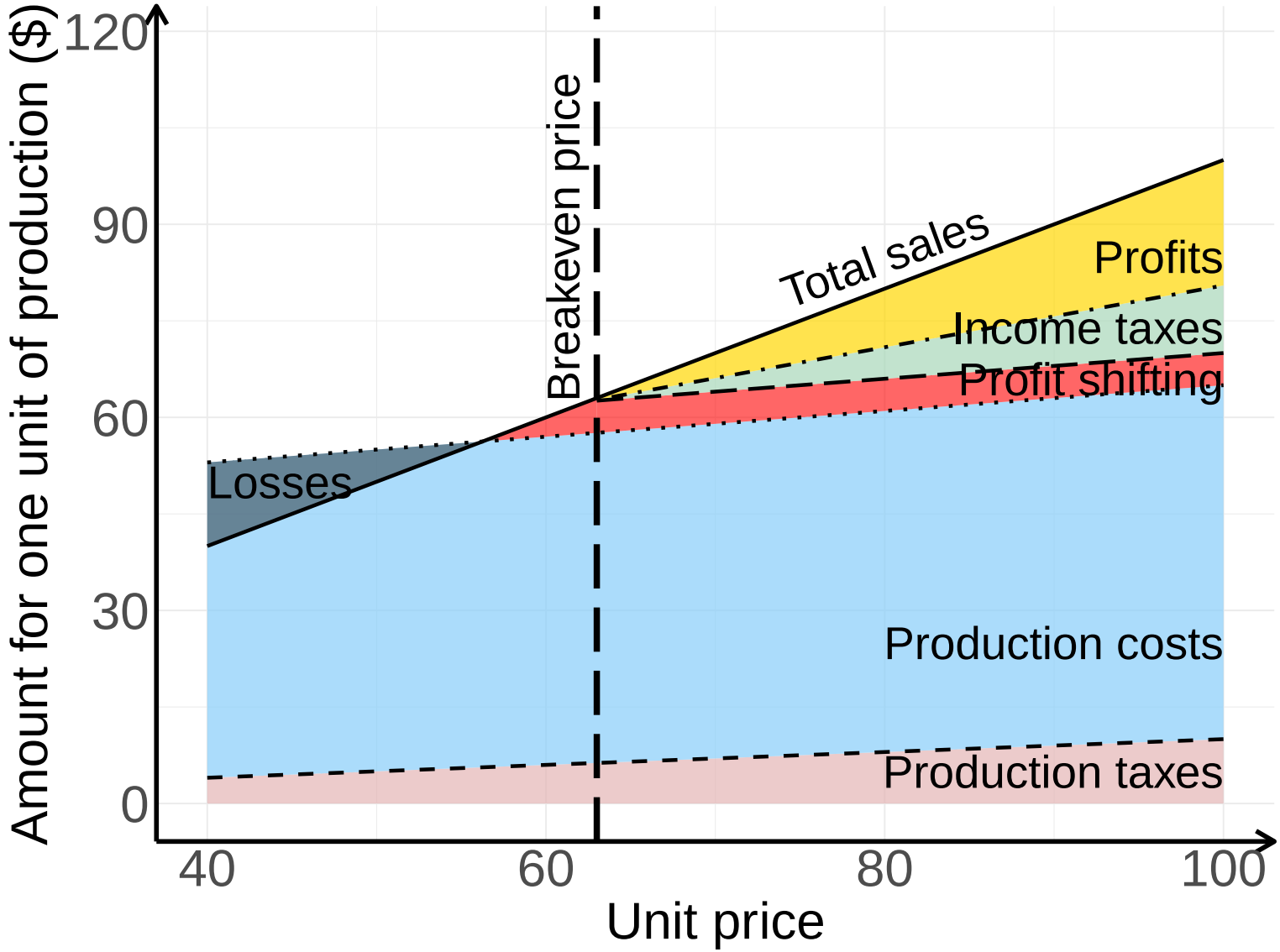
1. **Taxes on income**: in cash ($\approx 40\%$ of total revenues) or in kind (*production entitlements*, $\approx 35\%$).
2. **Taxes on production**: **Royalties** ($\approx 15\%$ of all payments).

Other smaller taxes:

- **Payments for infrastructure improvements**
- **Bonuses**: when discovery is made, if a certain level of production is achieved, or when a contract is signed
- **Fees**: includes export duties, license fees, entry fees, rental fees.

Back

Background: Extractives & profit shifting

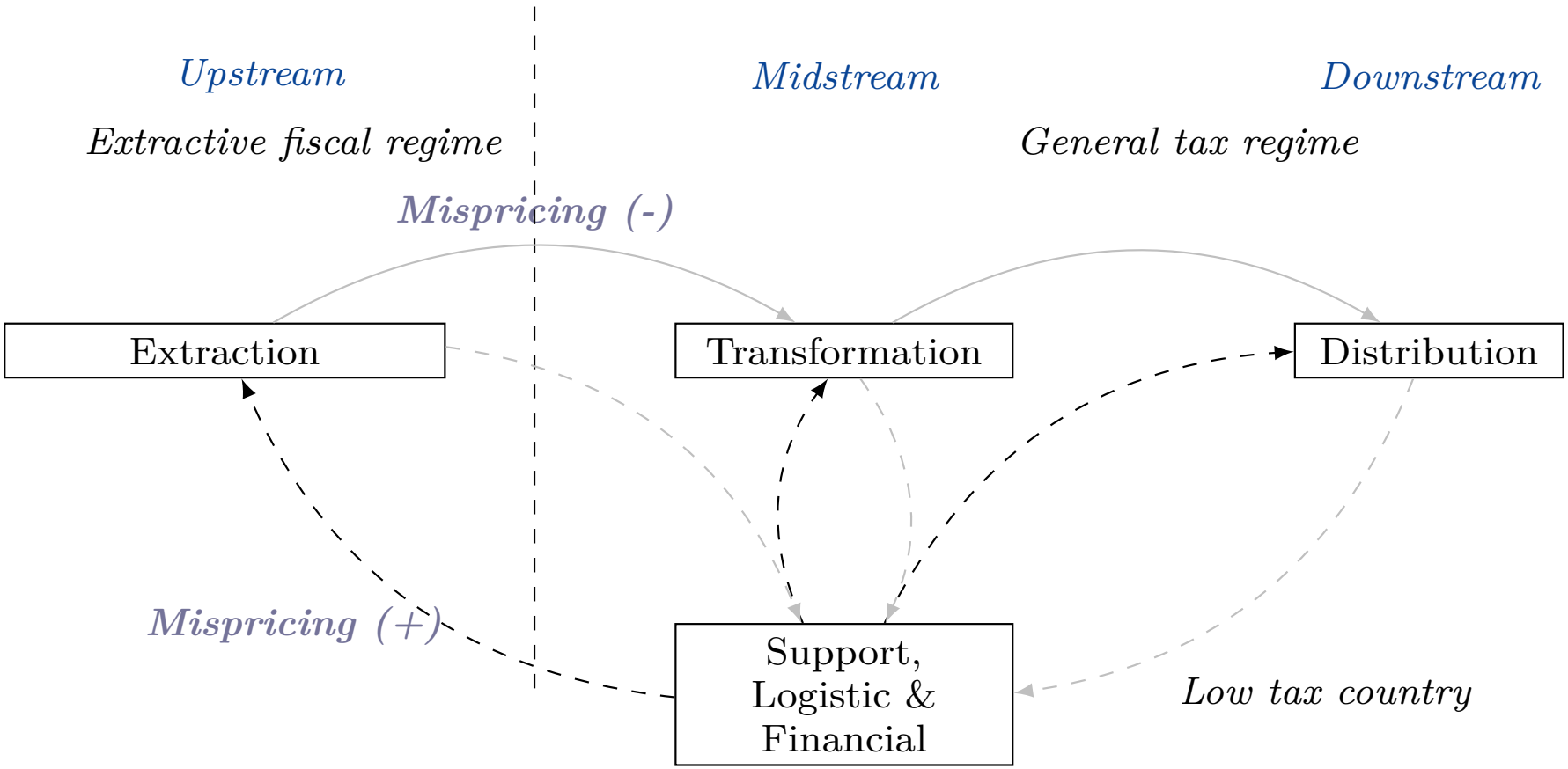


Note: Data source: Own computation.

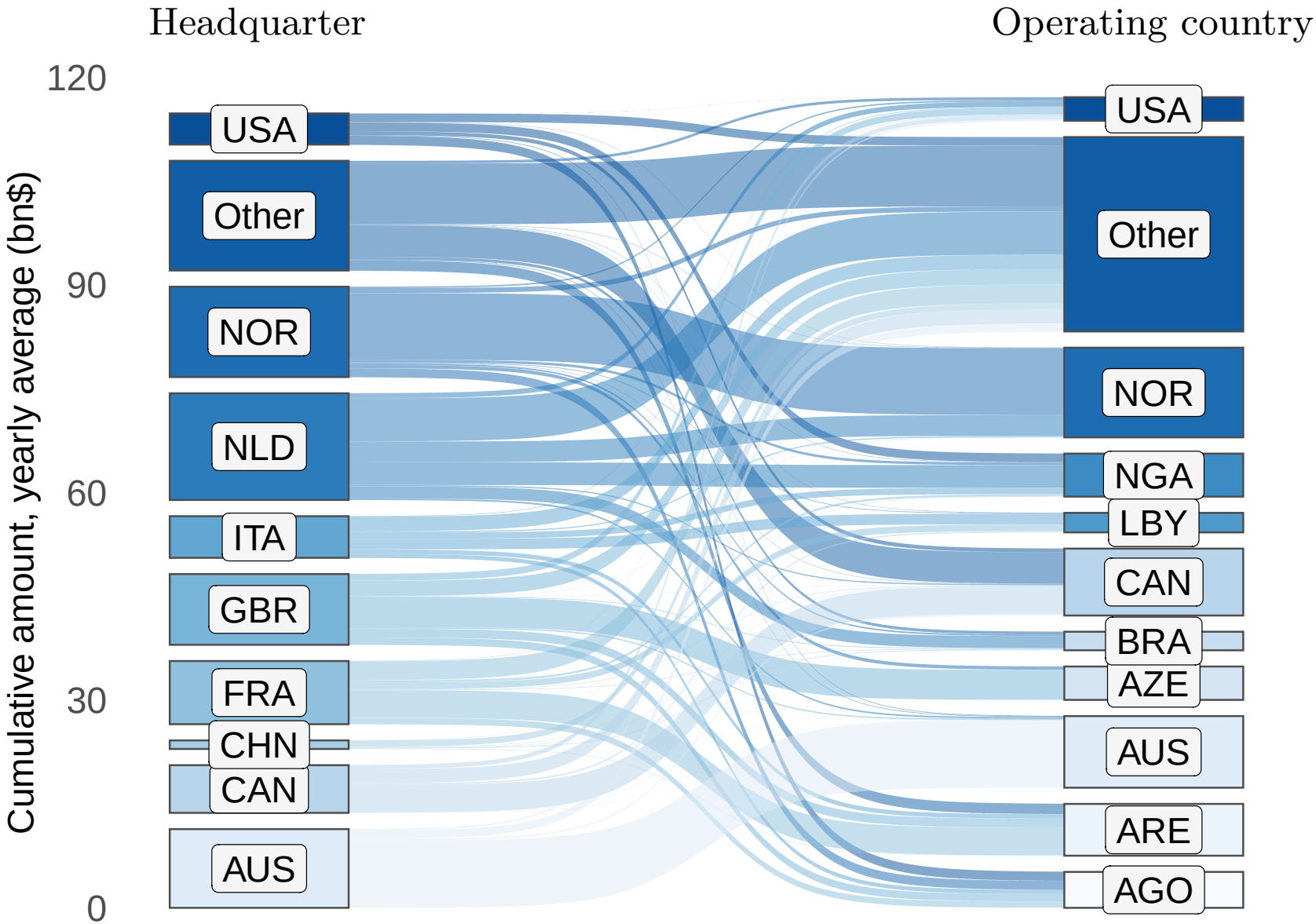
Background: Extractives & profit shifting

Incentive:

- Avoid potentially higher tax rates on extraction activity. ▸ Tax rates
- Reduce overall tax burden.



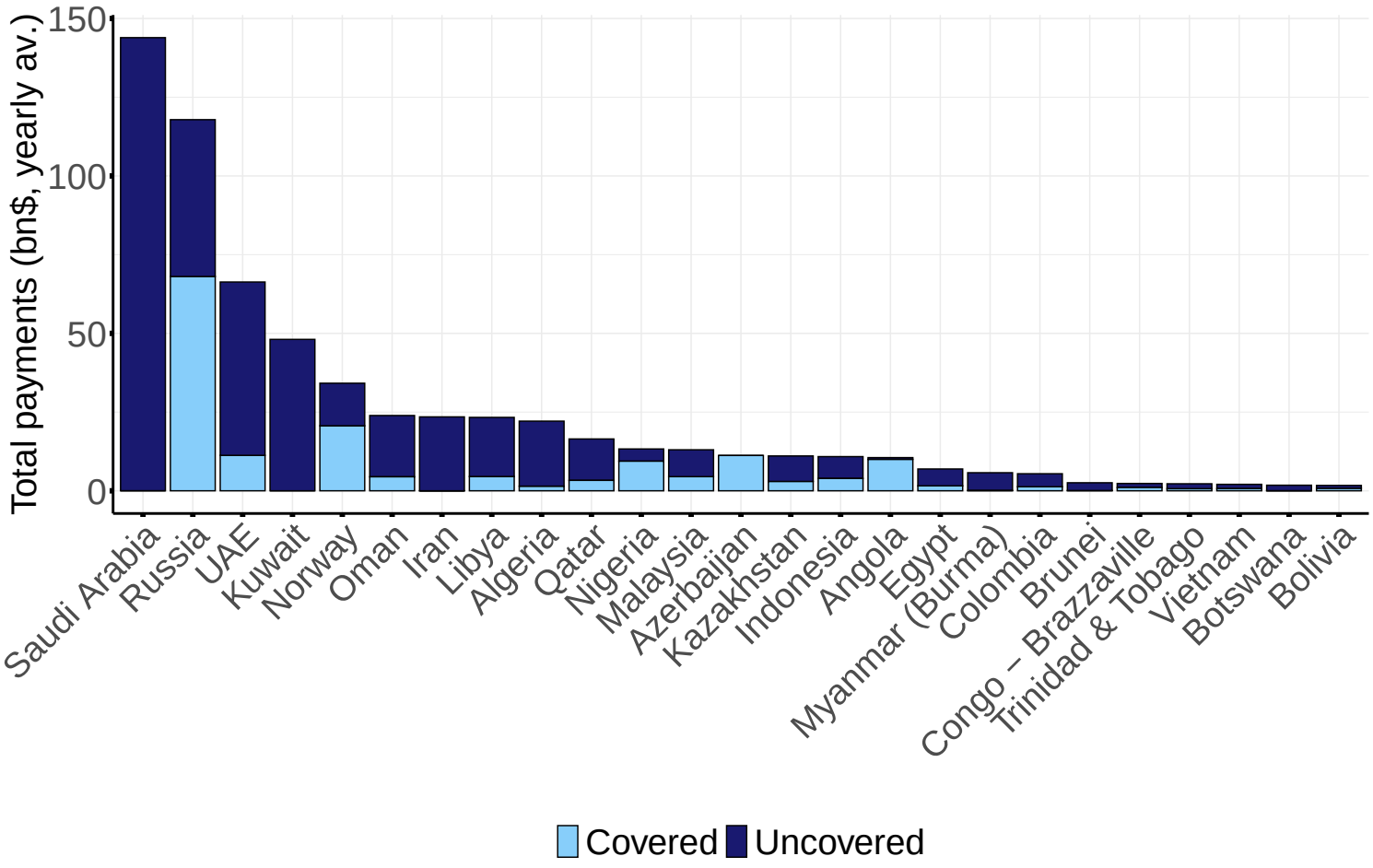
Headquarter location



Note: Data source: Extractive CBCR.

Map

Coverage of extractive CBCR ≈ 25% of total resource fiscal revenues



Note: Data source: UNU Wider GRD, extractive CBCR, Rystad & World Bank. Years 2016-2022. For the US, Australia & Canada, payments were estimated using Rystad & World Bank data. All the other payments come from UNU Wider.

▸ Map