The Missing Profits of Nations
Tørsløv, Wier, and Zucman (2020)

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Public Economics Reading Group

February 18, 2020

Outline

1. Motivation + Overview
2. Methodology + Data
3. Results
4. Discussion

Motivation

- Corporate tax rates declined over past decades
  - Global average statutory corporate tax rate: 49% in 1985, 24% in 2018
  - U.S. cut rate from 35% to 21%

- Potential reason: international tax competition
  - Provided some motoviation for the 2017 TCJA (Auerbach 2018) and the OECD “Base Erosion and Profit Shifting” Initiative

- But little evidence on how much countries lose/gain because of tax rate differences

- Why should we care?
  - Distorts competition?
  - Distributional: exacerbates inequality?
  - Efficiency: loss of tax revenue?

Overview

- Have little information on the *level* of profits attracted to each country due to existing corporate tax configuration
  - Good data on US multinationals, not on other countries

- Approach:
  - Use new macro data: foreign affiliate statistics (FATS)
  - Compare relative profitability of local vs. foreign firms in different countries

- Find that:
  - In high-tax countries: foreign firms systematically less profitable than local firms
  - In low-tax countries: foreign firms systematically more profitable than local firms
  - Estimate that 40% of multinational profits ($600bn) shifted to havens

- Contributions
  1. Methodology to construct profits from foreign affiliate statistics
  2. Facts on the macro relationship between affiliate profits and tax rate
  3. Calculation of lost profits by country
  4. Corrections of national account statistics

Previous literature

- Microeconometric estimates of of profit shifting on Orbis data:

$$\log(\pi_{ic}) = \alpha + \beta(\tau_p - \tau_c) + \delta \text{Firm}_i + \gamma \text{Country}_c + \epsilon_{ic}$$

  - Problem: does not track country-by-county/subsidiary-by-subsidiary profits well.
  - E.g., Apple had worldwide consolidated profits of €55.2bn, Orbis records €2bn total profits adding up subsidiaries

- Macro estimates: previously focused on US statistics (e.g., Zucman JEP 2014)

- Tax competition (Keen and Konrad 2013 for a review)

- Zucman's own work:
  - Estimates of individual wealth across countries (Zucman 2014, Zucman 2015 book)
  - Imputing wealth inequality from returns using capitalization method (Saez and Zucman QJE 2016)
  - Wealth tax (Saez and Zucman 2019 book)

Methodology

Macroeconomic profitability ratios and decomposition

- Focus on $\pi = \frac{\text{pre-tax corporate profits}}{\text{wages}}$
  - Will later compare within country profits between local (π_ℓ) and foreign-owned (π_f) firms
- Corporate output Y net of capital depreciation split between payments to workers and operating surplus to capital owners

$$Y = F(K, AL) = rK + wL$$

  - Capital share $\alpha = \frac{rK}{Y}$
- Capital owners pay p percent of rK in net interest.

$$\boxed{\pi = (1 - p)\frac{rK}{wL}}$$

π: profits made by resident firms per dollar of wage paid

  - Net interest for non-tax-havens small: $\pi \approx \frac{\alpha}{1-\alpha}$

Decomposing tax haven profits

- π_ℓ and π_f defined analogous. With s the wage bill of foreign firms:

$$\pi = s \cdot \pi_f + (1 - s) \cdot \pi_\ell$$

- A high π can arise from (i) high capital usage when K/L substitutable or (ii) shifting of paper profits

Decomposing tax haven profits

- Three ways that profits can be shifted
  1. **Transfer pricing** of goods/services
  2. Move **intangible assets** to low-tax countries
  3. Intra-group interest rate (internally borrow at high rates)

- Decomposition:

$$\pi_f = \left(\frac{K}{wL}\right)_f \cdot r_f \cdot (1 - p_f)$$

- Assumes
  1. $K - L$ elasticity $\sigma = 1$ (Cobb-Douglas PF, can relax)
  2. π_ℓ in tax havens not inflated by profit shifting (i.e., true local profits)

Allocating shifted profits

Thought experiment: *what would be the profit level in each country if the effective corporate tax rate were equalized?*

1. Estimate of profits shifted comes from setting $\pi_f = \pi_\ell$ for each country

2. Allocate profits proportionally to bilateral service exports and interest payments to tax havens

3. Trace out implications for tax revenue, capital shares, etc.

Data

Data sources

Three data sources

1. Foreign affiliate statistics (FATS): constract π_f
2. National Accounts (NA): constructed π
3. Balance of payments (BP): allocate shifted $\pi_f - \pi_\ell$

Foreign affiliates statistics (FATS)

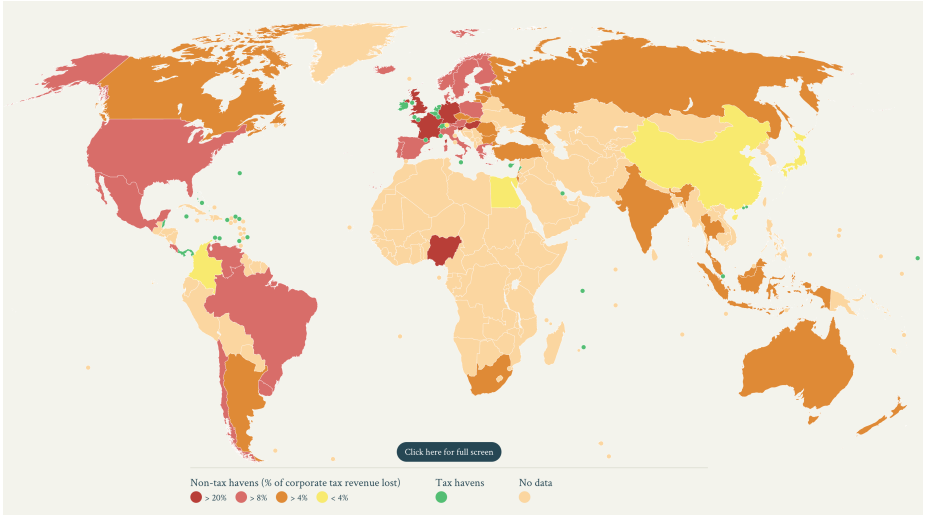
- Used to compute π_f
- Comes from statistical agency of countries (Eurostat: activities of multinational enterprises)
- Two types
  1. Inward FATS: Data on foreign firms operating in country X, by country of parent
  2. Outward FATS: Data on the affiliates of X's multinationals, by country of affiliate
- Some issues:
  - Some imputation needed to get to π_f of non-OECD tax havens
    1. Estimate pre-tax profits from direct investment (DI) statistics
    2. Compute wage bill using wage/profit ratio in outward FATS of counterparties (e.g., the US for small tax havens)
  - The inward FATS of country X should match outward FATS of all other countries for X. This is not the case for the US in IRE, LUX, NL
    - Likely that underestimate of profits booked by US affiliates in tax havens $\Longrightarrow$ scale up US profits for these countries to match US data

Additional data

- National accounts (NA)
  - Used to calculate π
  - OECD National Accounts by sector: includes OECD + large developing non-OECD countries
    - Extend to non-OECD tax havens
  - Impute capital depreciation and corporate sector wage bill when necessary using NA from similar countries

- Bilateral balance of payments (BP)
  - Compiled by IMF and Eurostat
  - Used to determine allocation of profits
  - Opt to use statistics reported tax havens when both exist

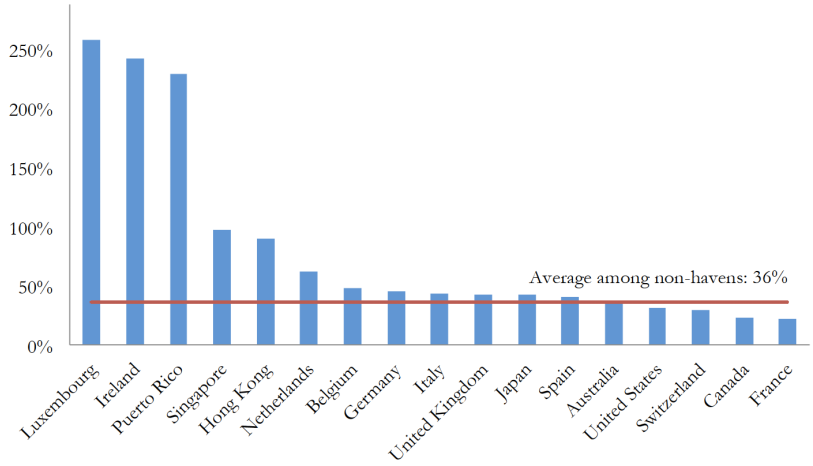
Where are the Tax Havens?



Results

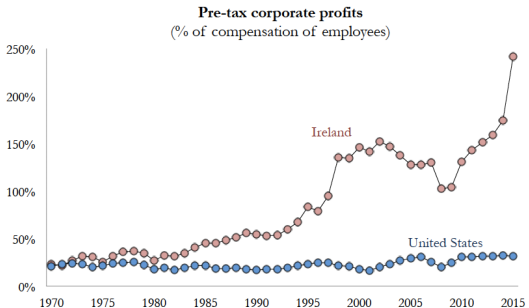
Fact #1: Firms in tax havens more profitable than in non-haven countries

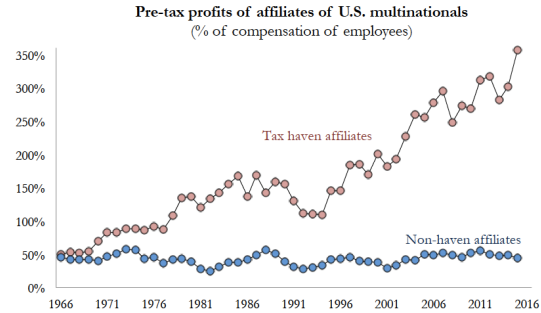
Figure 3: Pre-tax Corporate Profits (% Compensation of Employees)



Fact #2: Tax haven profitability has increased over time

Figure 5: The Rise of Profit Shifting

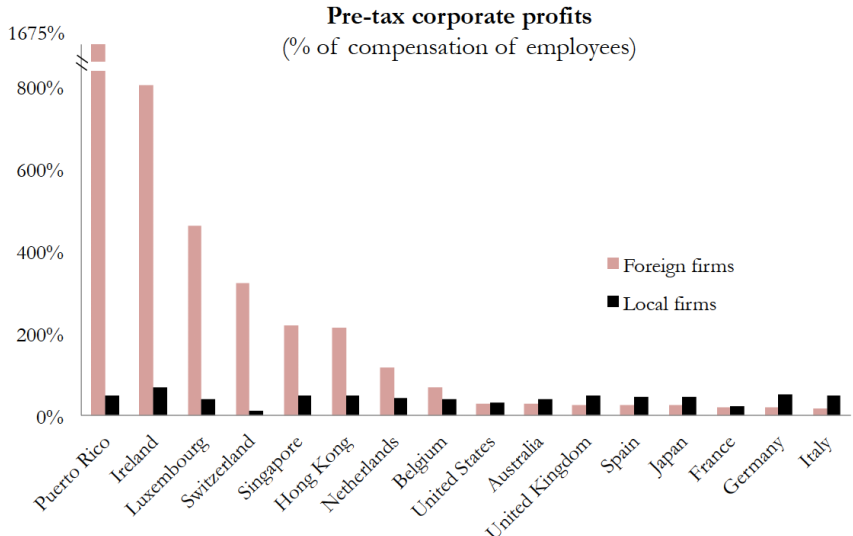




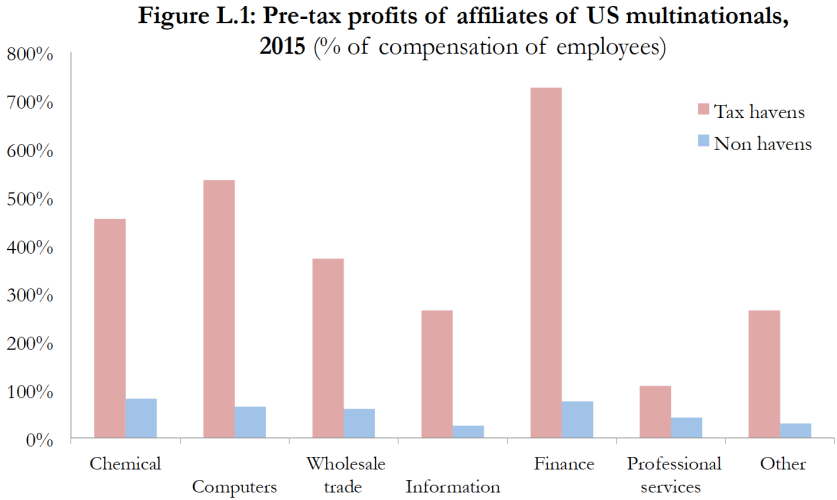
Notes: in the bottom panel, tax havens include: Ireland, Luxembourg, Netherlands, Switzerland, Bermuda and Caribbean tax havens ("Other Western Hemisphere" in the BEA data), and Singapore. Non-havens include all other countries. Sources: For top panel, national accounts of Ireland and the United States and authors' computations; for bottom panel: BEA survey of the activities of U.S. multinationals abroad, Tables II.F.1 and II.F.2, column "profit-type return" and "compensation of employees" .

Fact #3: Tax haven profitability driven by foreign firms

Figure 4: Profitability in Foreign vs. Local Firms

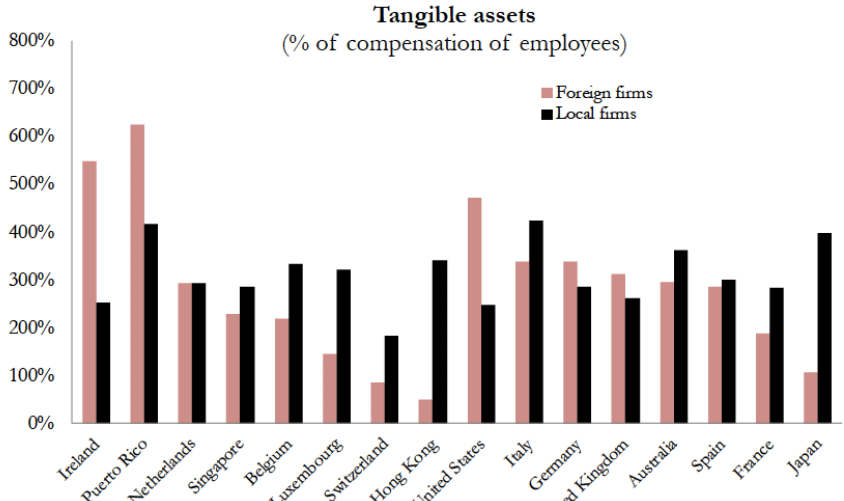


Results robust to controlling for sector



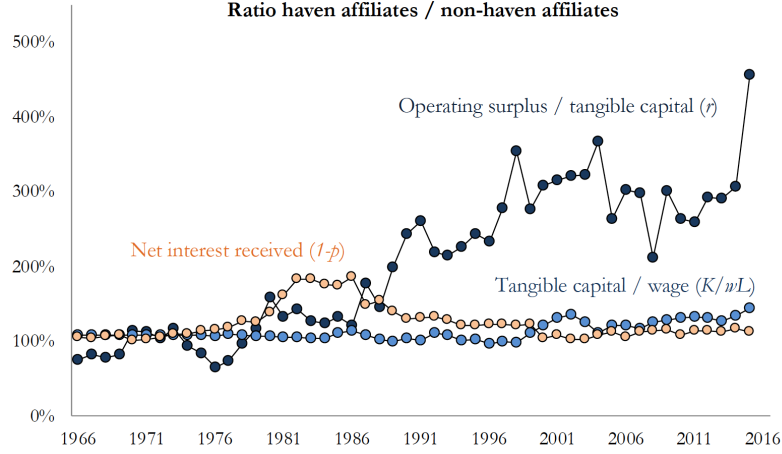
Decomposing the High Profits of Haven Affiliates

Figure 6: Capital Intensities in Tax Havens



Fact #4: Profits driven by excess returns r

$$\frac{\pi_{f,haven}}{\pi_{f,nonhaven}} = \frac{(K/wL)_{f,h}}{(K/wL)_{f,nh}} \cdot \frac{r_{f,h}}{r_{f,nh}} \cdot \frac{1-p_{f,h}}{1-p_{f,nh}}$$



Fact #5: 40% of multinationals profits shifted to tax havens

▸ High tax country shifting estimates ▸ Tax Haven shifting estimates

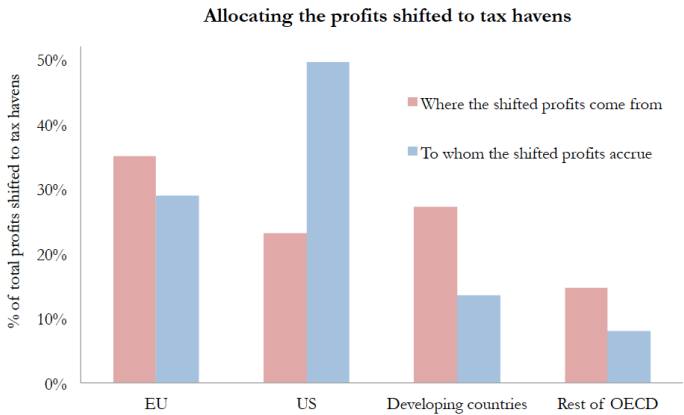
Table 1: Global Output, Corporate Output, and Corporate Taxes Paid (2015)

	Billions of current US$	% of net corporate profits
Global gross output (GDP)	75,038	
Depreciation	11,940	
Net output	63,098	
Net corporate output	34,083	296%
Net corporate profits	11,515	100%
Net profits of foreign-controlled corp.	1,703	15%
Of which: shifted to tax havens	616	5%
Net profits of local corporations	9,812	85%
Corporate income taxes paid	2,154	19%

Notes: Profits of foreign corporations include all the profits made by companies more than 50% owned by a foreign country; profits of local corporations equal all corporate profits minus the profits of foreign corporations. Source: Appendix Tables C.5 and A.3.

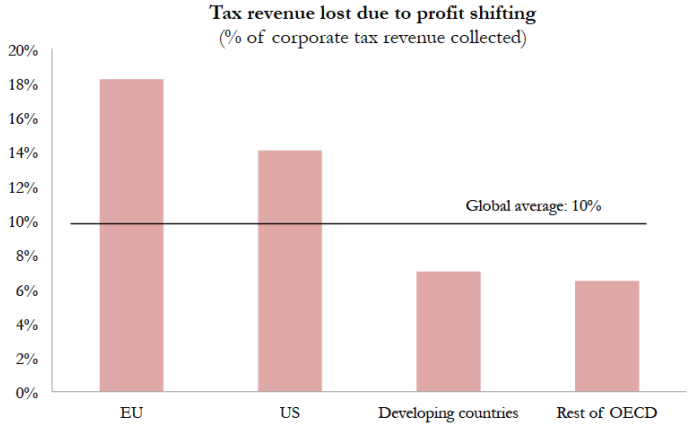
Fact #6: Source of shifted profits is 35% EU, 30% dev., 25% US

Figure 8: Allocating the Shifted Profits



Fact #7: 10% of global corporate tax revenue lost from profit shifting

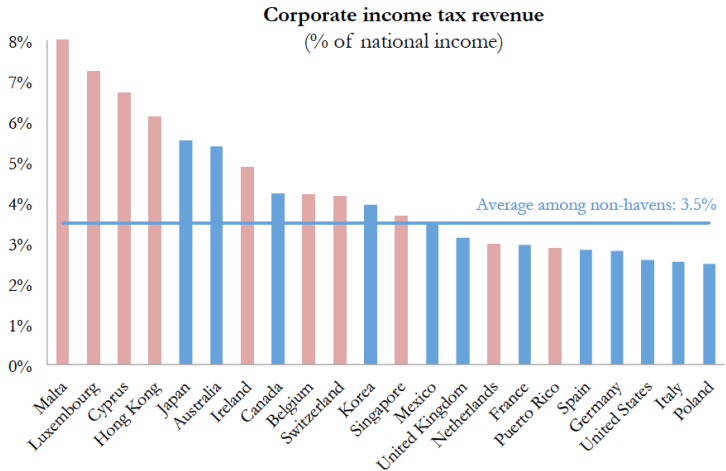
- Equalization of tax rate $\Longrightarrow$ 60% $\downarrow$ haven tax revenue, 10% $\uparrow$ US tax revenue
- Graph uses calculation from statutory tax rate:



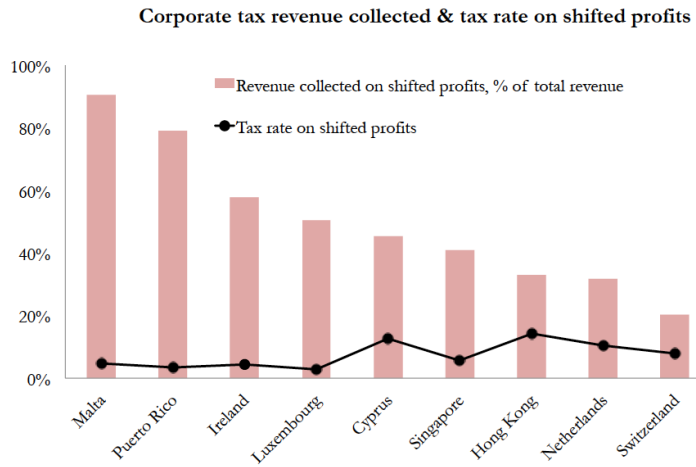
Note: Estimates are for 2015. Source: Appendix Tables C.4b, C.4c, and C.4d.

Haven corporate tax revenue and rates

Figure 9: Corporate Tax Revenue in Tax Havens



Corporate Tax Revenue Collected on Shifted Profits



Notes: data are for 2015. Source: Appendix Tables A.3., A.6., A.7, and A.11.

Fact #8: α underestimated with NA of high-tax countries

See Table

- Exercise: Add back in the profits shifted through returns to rK of source country.[1] Then recalculate α, Y, etc.
- $\Longrightarrow$ Find 2-2.5 pp increase in α_{EU}, 1.1 pp in α_{US}
- Equivalently: due to profit shifting, national accounts of tax havens are over-stated
- Also 25% (=0.7% of GDP) of trade balance is due to tax avoidance by multinationals.

[1] Interest rate payments do not affect total operating surplus.

Discussion

Summarizing results:

1. Firms in tax havens more profitable than in non-haven countries
2. Tax haven profitability has increased over time
3. Tax haven profitability driven by foreign firms
4. Profits driven by excess returns r
5. 40% of multinationals profits shifted to tax havens
6. Source of shifted profits is 35% EU, 30% dev., 25% US
7. 10% of global corporate tax revenue lost from profit shifting
8. α underestimated with NA of high-tax countries

Author's perspective on policy relevance

- Large capital discrepancies come from shifted profits, which means national corporate tax cuts (TCJA) are less effective
- Profit shifting difficult to control, might turn to other tax policy changes to make up for difficulty in handling shifted profits: individual income (wealth?) tax, Δ to tax base
- Distributional implications of shifted profits (DNA for $\pi_f - \pi_\ell$?)

Some comments

- Paper is more about the mobility of profits rather than its tax revenue implications
- *To appropriately evaluate policy changes, need a model to incorporate firm behavior in counterfactuals!*
  - Production function specification would likely matter more
  - Dynamic implications for firm behavior?
- Estimation relies on the comparison of local and foreign π, so important to consider how local and foreign firms may differ
  - Firm size differences
  - Inward profit shifting
- Their method of profit accounting is not the only way to do it!
  - Also consider alternative where profits accrue to where the parent firm is incorporated.
  - Sales-based apportionment formulas
  - Allocation by source of production (very hard!)
- Heterogeneity in shifted profits across firms: would we want to have a more targeted form of corporate tax (as the second best)?
- Profitability over time has implications by wealth inequality estimates ($K_i = r_i W_i$)

Thanks!

Appendix

Estimates of shifted profits I: high-tax

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Table 2: Shifted Profits: Country-by-Country Estimates (2015)

	Reported pre-tax profits	*Of which: Local firms*	*Of which: Foreign firms*	Shifted profits	Effective corporate tax rate	Corp. tax revenue loss/gain (% collected)
			OECD countries			
Australia	**179**	*151*	*28*	**12**	30%	7%
Austria	**48**	*37*	*11*	**4**	18%	11%
Canada	**143**	*96*	*47*	**17**	35%	9%
Chile	**68**	*58*	*10*	**5**	15%	11%
Czech Republic	**34**	*16*	*17*	**2**	20%	5%
Denmark	**52**	*47*	*5*	**3**	15%	8%
Estonia	**4**	*3*	*1*	**0**	12%	10%
Finland	**25**	*21*	*4*	**3**	20%	11%
France	**188**	*156*	*32*	**32**	27%	21%
Germany	**553**	*510*	*43*	**55**	11%	28%
Greece	**23**	*21*	*1*	**1**	19%	7%
Hungary	**21**	*11*	*10*	**2**	11%	21%
Iceland	**2**	*2*	*0*	**0**	19%	22%
Israel	**54**	*48*	*6*	**1**	17%	2%
Italy	**212**	*199*	*13*	**23**	18%	19%
Japan	**634**	*602*	*32*	**28**	26%	6%
Korea	**248**	*246*	*3*	**4**	18%	2%

Estimates of shifted profits II: tax havens

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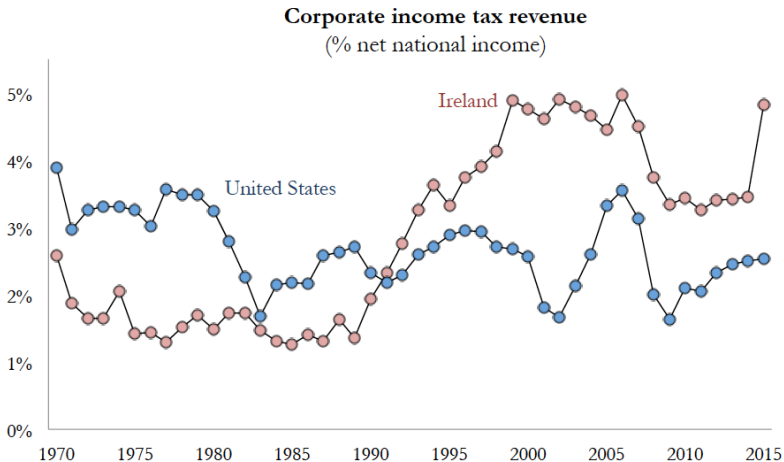
Main developing countries						
Brazil	**274**	*245*	*30*	**13**	20%	8%
China	**2,069**	*1,906*	*162*	**55**	20%	3%
Colombia	**59**	*52*	*7*	**1**	29%	2%
Costa Rica	**13**	*12*	*1*	**1**	12%	19%
India	**376**	*368*	*8*	**9**	10%	8%
Russia	**290**	*253*	*37*	**11**	14%	5%
South Africa	**76**	*68*	*9*	**4**	25%	6%
Tax havens						
Belgium	**80**	48	32	**-13**	19%	16%
Ireland	**174**	58	116	**-106**	4%	58%
Luxembourg	**91**	40	51	**-47**	3%	50%
Malta	**14**	1	13	**-12**	5%	90%
Netherlands	**195**	106	89	**-57**	10%	32%
Caribbean	**102**	4	98	**-97**	2%`	100%
Bermuda	**25**	1	25	**-24**	0%	
Singapore	**120**	30	90	**-70**	8%	41%
Puerto Rico	**53**	10	43	**-42**	3%	79%
Hong Kong	**95**	45	50	**-39**	18%	33%
Switzerland	**95**	35	60	**-58**	21%	20%
Other				**-51**		

Notes: amounts are in current billion US$. All data are for 2015. Source: Appendix Tables A.6., A.7, C.4d, and C.4.

Corporate Tax Revenue Time Series

Figure 10: The Redistribution of Corporate Income Tax Revenue



Capital share adjustments

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Table 3: Macro Statistics Corrected for Profit Shifting (2015)

	Corrected capital share	*Difference with published data*	Corrected trade balance	*Difference with published data*
		OECD countries		
Australia	26%	*+1.1%*	-1.4%	*+0.8%*
Austria	29%	*+1.3%*	4.1%	*+0.8%*
Canada	24%	*+1.4%*	-1.4%	*+0.9%*
Chile	51%	*+1.5%*	1.8%	*+1.8%*
Czech Republic	39%	*+1.0%*	6.5%	*+0.7%*
Denmark	31%	*+1.2%*	8.2%	*+0.8%*
Estonia	35%	*+1.1%*	5.0%	*+0.9%*
Finland	28%	*+1.6%*	0.9%	*+1.0%*
France	19%	*+2.1%*	0.4%	*+1.1%*
Germany	31%	*+1.8%*	9.2%	*+1.2%*
Greece	43%	*+1.1%*	0.3%	*+0.5%*
Hungary	39%	*+2.3%*	10.4%	*+1.5%*
Iceland	33%	*+3.4%*	9.5%	*+2.0%*
Israel	37%	*+0.2%*	3.2%	*+0.2%*
Italy	30%	*+1.0%*	3.0%	*+1.0%*