How much profits move across countries because of differences in corporate tax rates?

- Firms move capital to low-tax countries
- Firms shift paper profits to tax havens

If all countries had same effective corporate tax rate:

- Which countries would gain/lose profits?
- How? Relocation of capital, or reduced profit shifting?
New data: foreign affiliates statistics → wages, profits, etc., of foreign firms
How we estimate the amount of profits shifted to tax havens

We compute **capital shares** $\alpha$ **in foreign vs. local firms** across the world. Striking global pattern:

- Foreign firms have lower $\alpha$ than local firms...
- ... Except in tax havens: hugely higher $\alpha$

**Benchmark estimate:** set profitability of foreign firms in havens equal to profitability of local firms in havens

- Transparent
- Robust
New data: bilateral service trade
How we allocate the shifted profits

Benchmark: follow destination of tax havens’ service exports and intra-group interest receipts

- Services: focus on royalties, management fees, ICT, fin. services → most conducive of shifting

- Outcome: granular estimates of profit shifting (eg, France–Ireland, Germany–Switzerland, etc.)

- Consider also other apportionment rules
Main results

40% of multinat’l profits ($\approx$ $600bn) shifted to havens

- Main winners: Ireland, Luxembourg, Singapore, etc. (impose low rates of $<5\%$, but on big $600bn$ base)
- Main loser: EU (20% of profits shifted; US: 15%)
- Profit shifting swamps tax-driven tangible capital mobility (different welfare implications)
- Rise of capital share in higher than in official data $\rightarrow$ provide corrected estimates of $\alpha$, GDP, trade
Why should we care?

Whatever one’s view about efficiency costs of capital taxation, global profit shifting raises policy issues:

- Unequal playing field
- Inequality
- Loss of tax revenue
Global Profit Shifting
How multinationals shift profits offshore

Three ways firms shift profits to low-tax countries:

▷ Manipulation of intra-group export and import prices
▷ Intra-group interest payments (tax deductible)
▷ Strategic location of intangibles
Previous literature on global profit shifting

Vast literature on shifting by US multinationals

Few papers on global profit shifting, due to data issue

▷ Key data source: Orbis registry data

▷ Problem: poor Orbis coverage in tax havens...

▷ ... where the bulk of shifting takes place
Most of Google’s profits are invisible in available financial accounts data.
Most of Apple’s profits are invisible in available financial accounts data.

Apple's profits in Orbis

- True global profits
- Sum of observable profits
None of Facebook’s profits are visible in available financial accounts data.

**Facebook's profits in Orbis**

- **True global profits**
  - 2013: €2 Bn.
  - 2014: €4 Bn.
  - 2015: €5 Bn.
  - 2016: €11 Bn.
Most of Nike’s profits are invisible in available financial accounts data.
This paper: global macro approach

Directly observable profits booked in tax havens based on foreign affiliates statistics (FATS)

▷ Census-like confidential surveys → more comprehensive than Orbis

▷ Harmonized definitions and guidelines

▷ No double-counting (≠ financial accounting)

▷ Missing countries (eg, Caribbean): use balance of payments and partners’ FATS (BoP)

↓

First global map of multinational profits
### A new global database on profits (2015)

<table>
<thead>
<tr>
<th></th>
<th>Billions of current US$</th>
<th>% of net corporate profits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global gross output (GDP)</td>
<td>75,038</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>11,940</td>
<td></td>
</tr>
<tr>
<td>Net output</td>
<td>63,098</td>
<td></td>
</tr>
<tr>
<td>Net corporate output</td>
<td>34,083</td>
<td>296%</td>
</tr>
<tr>
<td>Net corporate profits</td>
<td>11,515</td>
<td>100%</td>
</tr>
<tr>
<td>Net profits of foreign-controlled corp.</td>
<td>1,703</td>
<td>15%</td>
</tr>
<tr>
<td>Of which: shifted to tax havens</td>
<td>616</td>
<td>5%</td>
</tr>
<tr>
<td>Net profits of local corporations</td>
<td>9,812</td>
<td>85%</td>
</tr>
<tr>
<td>Corporate income taxes paid</td>
<td>2,154</td>
<td>19%</td>
</tr>
</tbody>
</table>
Key statistic of interest: profitability $\pi$

- Country’s corporate output $Y = F(K, AL) = rK + wL$
- Capital share $\alpha = rK/Y$
- $r =$ normal + above-normal return
- Net interest paid = $p\%$ of $rK$
- Pre-tax profits/wage ratio: $\pi = (1 - p) \cdot \alpha/(1 - \alpha)$

Compute $\pi$ for foreign ($\pi_f$) vs. local firms ($\pi_l$) (foreign: $>50\%$ foreign-owned)
In non-havens, foreign firms are less profitable than local firms.
In tax havens, foreign firms are much more profitable than local firms.

**Pre-tax corporate profits**

(% of compensation of employees)

- Foreign firms
- Local firms
Benchmark estimate of profits shifted to tax havens

Set $\pi_f$ in havens equal to profitability local firms $\pi_l$

- Can be easily computed in each haven
- Easy to track for policymakers (eg, to study effects of policies)
- Allows havens to have higher overall profitability than non-havens (due, eg, to anti-labor policies)
## Estimated profits shifted in each haven

<table>
<thead>
<tr>
<th>Haven</th>
<th>Reported pre-tax profits</th>
<th>Of which: Local firms</th>
<th>Of which: Foreign firms</th>
<th>Shifted profits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>80</td>
<td>48</td>
<td>32</td>
<td>-13</td>
</tr>
<tr>
<td>Ireland</td>
<td>174</td>
<td>58</td>
<td>116</td>
<td>-106</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>91</td>
<td>40</td>
<td>51</td>
<td>-47</td>
</tr>
<tr>
<td>Malta</td>
<td>14</td>
<td>1</td>
<td>13</td>
<td>-12</td>
</tr>
<tr>
<td>Netherlands</td>
<td>195</td>
<td>106</td>
<td>89</td>
<td>-57</td>
</tr>
<tr>
<td>Caribbean</td>
<td>102</td>
<td>4</td>
<td>98</td>
<td>-97</td>
</tr>
<tr>
<td>Bermuda</td>
<td>25</td>
<td>1</td>
<td>25</td>
<td>-24</td>
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<tr>
<td>Singapore</td>
<td>120</td>
<td>30</td>
<td>90</td>
<td>-70</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>53</td>
<td>10</td>
<td>43</td>
<td>-42</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>95</td>
<td>45</td>
<td>50</td>
<td>-39</td>
</tr>
<tr>
<td>Switzerland</td>
<td>95</td>
<td>35</td>
<td>60</td>
<td>-58</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td>-51</td>
</tr>
</tbody>
</table>
Shifted profits: robustness

\( \pi_l \) in havens inflated by inward shifting?

▷ Robustness test: vary \( \pi_l \) → very little difference

Foreign firms different than local firms?

▷ Sectoral composition → look at \( \pi_f - \pi_l \) within sector

▷ Capital intensity → testable

▷ Size → testable down the road with FATS by size
Tax haven firms are abnormally profitable within each sector

**Pre-tax corporate profits** (% of compensation of employees)  
(Foreign affiliates of US multinationals, 2015)
Testing the hypothesis that machines move to low-tax places

If havens attract highly capital-intensive industries:
- With Cobb-Douglas production, this does not affect $\pi$
- With CES production & $\sigma > 1$, high $K/AL \rightarrow$ high $\pi$

Test using data on affiliates of US multinationals:
- US data more detailed (info on $K$)
- Annual since 1982, every 5 years back to 1966
Tax haven affiliates of US multinationals have been increasingly profitable

Pre-tax profits of affiliates of U.S. multinationals
(% of compensation of employees)

Tax haven affiliates

Non-haven affiliates
Globalization has been paper profits—not machines—moving to low-tax places.

The profitability $\pi$ of the affiliates of US multinationals (ratio of Haven affiliates / Non-haven affiliates)

$$\pi = \frac{\text{Operating surplus}}{\text{Physical capital}} \cdot \frac{\text{Physical capital}}{\text{wage}} \cdot (1-p)$$
Who Loses?
Allocating the Shifted Profits
To study who loses profits, follow the money in balances of payments of havens.
Who shifts most? The US. Who loses most? The EU.

Allocating the profits shifted to tax havens

- % of total profits shifted to tax havens
- EU
- US
- Developing countries
- Rest of OECD

Where the shifted profits come from
To whom the shifted profits accrue
Computing tax revenue losses

Benchmark: apply statutory rate to missing profits
- Find 10% of corporate tax revenue lost
- Similar to OECD (but different reasons)

Robustness:
- Taxes paid when IP initially transferred
- Taxation of passive income in residence country
Corporate tax revenue losses

Tax revenue lost due to profit shifting
(% of corporate tax revenue collected)

Global average: 10%
Explaining the rise of profit shifting
Beggar-thy-neighbor pays off

Incentives of havens can explain the rise of shifting:

- With source taxation & no coordinat° or sanction, havens can earn revenue by attracting paper profits.
- For small countries, revenue-max. rate $0 < \tau^* < 5\%$: havens with $\tau \approx \tau^*$ generate very large tax revenue.
- Can explain the rise of the supply of tax avoidance schemes (e.g., tax rulings: Apple – Ireland).
Many havens collect a lot of tax revenue...

Corporate income tax revenue (% of national income)

Average among non-havens: 3.5%
... By applying low rates to the huge tax base they attract

Corporate tax revenue collected & tax rate on shifted profits

- Revenue collected on shifted profits, % of total revenue
- Tax rate on shifted profits

Malta  Puerto Rico  Ireland  Luxembourg  Cyprus  Hong Kong  Singapore  Netherlands  Switzerland
As profit shifting rose...
...Tax revenue rose in many havens, while they ↓ or stagnated in high-tax countries
The lower the rate, the higher the revenue
Explaining the persistence of profit shifting
The policy failure of high-tax countries

Why haven’t high-tax countries protected their base?

Our explanation: **failure of tax enforcement**

- In current international tax system, tax authorities have **perverse incentives**
- Higher expected gain of relocating base booked in other high-tax countries than base shifted to havens
- Rational outcome: chase profits booked in other high-tax countries, not those shifted to havens
The incentive problem of tax authorities

€1 re-located to Denmark is worth the same to Denmark whether it comes from Germany or Bermuda. But much easier to relocate €1 booked in Germany:

- Feasible: information exists (Orbis)
- More likely to succeed: no push-back from firms
- Quick: cooperation via dispute settlement agreements

Crowds out enforcement on havens: hard (no data), costly (legal defense by firms), lengthy (lack of cooperation)
Most transfer price enforcement is against other high-tax countries.

Distribution of Danish transfer price corrections (value)

Note: The graph plots the distribution of the value of transfer price corrections by counterpart. Transfer price corrections are cases in which the Danish tax authority have corrected an intra-group cross-border transfer price and as a result raised the taxable profits of firms operating in Denmark. The counterpart is the country that the Danish tax authority argue have received excessive taxable profits. The graph shows that 65% of the value of transfer pricing corrections concerns a high tax country (Non tax haven).
Most transfer price enforcement is against other high-tax countries.

Countries most often targeted in transfer price disputes.

- United States: 12 times
- Germany: 10 times
- Switzerland: 8 times
- Netherlands: 6 times
- Japan: 4 times
- UK: 3 times
- France: 2 times
- Korea: 2 times
- Australia: 1 time
- Austria: 1 time
- Norway: 1 time
- China: 1 time
- Cayman I.: 1 time
- Singapore: 1 time
- Denmark: 1 time
- Canada: 1 time
- Czech: 1 time
- Taiwan: 1 time
- Finland: 1 time
- Poland: 1 time
- BVI: 1 time
- Hong Kong: 1 time
- Panama: 1 time
- Sweden: 1 time
- Barbados: 1 time
Can more cooperation and better information solve the problem?

Facilitating dispute settlement can backfire:

- Ongoing initiative to ↑ cooperation within OECD
- Problem: crowds out enforcement on non-OECD havens, where bulk of shifting takes place

Better information can help, but not enough:

- Even with perfect info, firms will always fight more to protect profits they book in low-tax places
- Internalizing this, tax authorities will keep going after high-tax places
Even when tax havens cooperate, tax authorities do not target them.
Conclusion
Main findings

40% of multinational profits shifted to tax havens:

- Paper profits move; tangible capital not much
- EU is the main loser; US the main shifter
- High losses for the EU can be explained by failure of enforcement due to perverse incentives

Tax competition has large redistributive effects, but different than in textbook model

Rise of global capital share since 1980s higher than in official data (e.g., twice as large in Europe)
Next steps

Introduce inequality dimension in the analysis:

▷ Compared to benchmark of perfect tax coordination, how much do shareholders of multinationals gain?

▷ How much do workers and various income/wealth groups gain/lose in each country?

→ Ultimate goal: offer full-fledged macro-distributional analysis of globalization with unequal tax rates
Supplementary slides
Only 17% of multinationals’ profits are visible in financial accounts micro-data.

The missing profits in Orbis

- Weighted average: 17%

Note: This graph shows the imperfect coverage in Orbis. For each multinational firm we take the sum of profits made by all subsidiaries registered in Orbis and divide by the global profits of the same multinational. Whenever the share is lower than 1 this means that we only see part of the global profits in Orbis.
Imputation of profits in foreign firms when no FATS exist

Compute profits in foreign firms using direct investment income flows

▷ 10% vs. 50% ownership threshold; pre-tax vs. post-tax → impute taxes

▷ Assume profits / wage same as for US affiliates

Imputation when no direct investment income data exist:

▷ Estimate direct investment income paid such that world DI income balances to 0

▷ Two reasons why global DI income > 0: missing US profits in Ireland etc.; missing BoP → we impute both
The huge profits of foreign firms make tax havens abnormally profitable overall.

Pre-tax corporate profits (% of compensation of employees)

Average among non-havens: 36%
Anomalies in the world balance of payments

The world current account discrepancies

- Trade balance
  - (missing service imports from tax havens; missing goods imports in China)
- Direct investment income balance
  - (missing income of US affiliates; Caribbean)
- Portfolio & other income balance
  - (offshore household wealth)
The unrecorded profits of U.S. affiliates in tax havens

Pre-tax corporate profits
(% of compensation of employees)

- Missing profits of other multinationals
- Missing profits of U.S. multinationals
- As reported in the national accounts

Average among non-havens: 36%
Tax haven affiliates of U.S. multinationals are abnormally profitable

Pre-tax profits of affiliates of U.S. multinationals in 2015
(% of compensation of employees)

Average among non-haven affiliates: 49%
Service imports from tax havens are under-estimated by importers (B2C sales)

The missing service exports of the six EU tax havens

<table>
<thead>
<tr>
<th>Country</th>
<th>€ Bn.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luxembourg</td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td></td>
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<tr>
<td>Netherlands</td>
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<tr>
<td>Malta</td>
<td></td>
</tr>
<tr>
<td>Cyprus</td>
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</tr>
</tbody>
</table>

Exports to EU22 recorded by exporter
Imports recorded by EU22
At least 30% of the services exported by EU havens go unreported by the importer.

Note: Service exports include exports to all EU22 countries (EU26 minus Luxembourg, Ireland, Belgium, Netherlands, Malta, Cyprus).
As settlement is facilitated, high-tax to high-tax disputes are growing.
Multinationals outspend tax authorities

Governments vs. corporate transfer pricing specialists

Wage bill ≈ €15 Billion

Source is LinkedIn, but the government count is corroborated by the EY Transfer Pricing Tax Authority Survey (2014). The wage bill is estimated by applying the average salary of an EY Transfer Pricing Specialist (Source: Glassdoor).