The impact of tax differentials on pre-tax income of Swiss multinational enterprises

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About me

- studied at the University of Zurich (2011-2017)
- thesis written in Summer 2017, appeared in JUMS in March 2018
- currently working in an analytics role in Oslo
- like running, snow sports, coding and reading

What is it about?

- **Do Swiss multinational enterprises shift profits?**
- *multinational enterprise*: Corporate group with different legal affiliates (Swiss parent & foreign subsidiaries) in different countries
- *shifting profits*: deliberately and artificially relocate income to low-taxed jurisdictions

Ways to shift profits

Affiliates (parent & subsidiary companies of the same enterprise)

- Sell intermediate goods from high-taxed (low-taxed) affiliate to low-taxed (high-taxed) affiliate at above (below) market price
- Provide loans from high-taxed (low-taxed) affiliate to low-taxed (high-taxed) affiliate at below (above) market interest rate
- The taxes saved amount to the difference in tax rates multiplied by the transfer price or interest payment

Why is it interesting to study profit shifting in Switzerland?

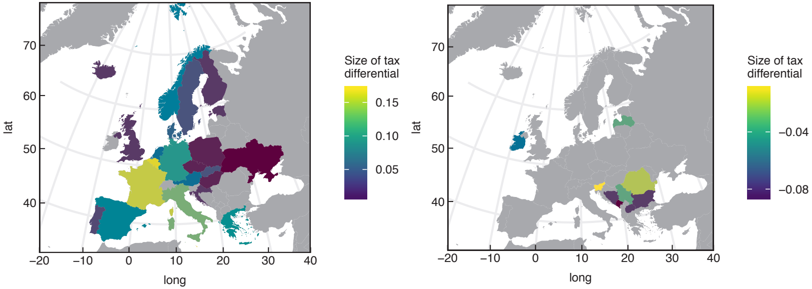

Figure 1: Tax differentials in Europe in 2015

- Tax differential: $\tau = \text{foreign tax rate} - \text{Swiss tax rate}$

How to study profit shifting?

- Find a relationship between earnings **before** interest and taxes, and tax differentials
- H_0 : EBIT is not influenced by taxes (in the absence of profit shifting)
- There exist other ways (e.g. using transfer prices)

Data

- unit of observation: subsidiary of a Swiss parent company
- panel data: each subsidiary observed over multiple years, 2007-2015
- balance sheet data from ORBIS (Bureau van Dijk)
- tax data from KPMG, GDP data from the World Bank
- sample size: 4’862 subsidiaries, 26’869 observations (from 63 countries)

Model

$$\ln \Pi_{it} = \beta_0 + \beta_1 \cdot \ln A_{it} + \beta_2 \cdot \ln L_{it} \\ + \beta_3 \cdot \ln K_{it} - \beta_4 \cdot \tau_{it} + u_{it}$$

- Π_{it}: Earnings before interest and taxes,
- A: Technology input (GDP per capita),
- L: Labour input,
- K: Capital input,
- τ: Tax differential (subsidiary rate - Swiss rate)
- Fixed effects (subsidiary, time) also included but left out for simplicity

$\rightarrow H_0$: $\beta_4 = 0$, $\rightarrow H_A$ (profit shifting): $\beta_4 < 0$

How to use the model?

$$\ln \Pi_{it} = \beta_0 + \beta_1 \cdot \ln A_{it} + \beta_2 \cdot \ln L_{it} \\ + \beta_3 \cdot \ln K_{it} - \beta_4 \cdot \tau_{it} + u_{it}$$

- Marginal effect: $\partial \ln \Pi_{it} / \partial \tau_{it} = -\beta_4$
- log-level specification: Marginal effect can be interpreted as a semi-elasticity
- **"A change in τ_{it} by 1 percentage point (0.01) is associated with an average decrease of Π_{it} by β_4 percent."**

Some results

- $\beta_4 = -1.458$ (t-statistic: -3.390), statistically significant
- **If the tax differential increases by 1 percentage point, the subsidiary EBIT decreases by 1.458%.**
- Beer & Loeprick (2015): -1.00, Dischinger (2008): -0.75

Interpreting the result

Example 1: The average subsidiary

EBIT $= 698'716$ CHF, tax differential $= 0.082 \rightarrow$ effect $=$ $698'716 \text{ CHF} \cdot -1.458\% = -10'481$ CHF

Example 2: ABB AS, Norwegian subsidiary (wholly owned, 2013 data)

EBIT $= 127'834'360$ CHF, tax differential $= 0.10 \rightarrow$ effect $=$ $127'834'360 \text{ CHF} \cdot -1.458\% = -1'863'825$ CHF

Shortcomings

- Ownership data: not available, shifting between subsidiaries not respected
- Ownership data: for last year available only
- ORBIS: low coverage for tax havens
- Losses: Companies with a loss have a different incentive to shift profits

Points for discussion

- Is profit shifting unethical or a smart way to maximise income?
- Should countries with low effective taxes be put under pressure?
- Is international cooperation necessary to build tax laws or should market forces guide the way to an equilibrium?

Thank you!

If you have further questions, or want to get in touch:

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