

# **Profit Shifting and Corporate Tax Rate Differences**

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# Basic Question

- Do multinational corporations use financial and accounting practices to alter the location of taxable profits in order to take advantage of international differences in corporate tax rates?
- An important question, but difficult to answer.

# Why a Difficult Question to Address?

- One simple approach: look at differences in rates of return between US-owned companies and companies owned by foreign parents in low-tax jurisdictions. But
  - There may be other differences between such groups, so are differences due to tax rates?
  - When firms are multinationals, foreign-source income and assets are not measured consistently, so rates of return may not be comparable across companies.

# Our Approach

- Eliminate problem of measuring foreign-source income and assets by looking exclusively at domestic firms – firms that have operations only in the United States.
  - Examine US-owned domestic firms and foreign-owned domestic firms.
- Control for unobserved differences across firms by using firm fixed effects, so that primary source of variations in tax rate differentials come from tax reforms.

# One Robust Finding

- Increases in the US-foreign tax rate differential reduce reported US rate of return

# Methodology and Data

- Start with all US C corporate tax returns for the period 1996-2006. Then reduce sample by dropping observations with
  - Foreign source income
  - $< 1\text{m}$  in assets
  - Overall rates of return (**((interest + earnings)/(debt + net assets))**) not between -100% and +100%
  - Interest  $> 100\%$  of assets
  - Parents in countries with fewer than 275 total observations
  - Financial firms

# Methodology and Data

- With these screens, have
  - 91,968 firms
  - 375,268 observations
  - 35 parent countries
- About 15% of firms in sample are foreign controlled

# Variables of Interest

- Dependent variables:
  - Overall rate of return defined already
  - $\text{Interest}/(\text{Debt} + \text{Net Assets})$
- Look separately at these variables to consider different types of shifting, e.g., location of interest vs. location of other expenses or revenues
- Note: For domestic firms, US rules for allocation of interest (and R&D) not relevant.

# Variables of Interest

- Independent Variables:
  - Tax rate differential (US – parent; = 0 if US-owned)
    - Use statutory tax rates since these drive income shifting incentives
  - Worldwide parent (=1 if worldwide)
    - UK, Taiwan, Singapore, Mexico, Korea, Japan, India
    - No variation over time
  - Tax haven parent (=1 if haven)
    - Bahamas, Bermuda, British Virgin Islands, Cayman Islands, Hong Kong, Ireland, Liberia, Liechtenstein, Luxembourg, Netherland Antilles, Panama, Singapore, Switzerland
    - No variation over time
  - Control variables for industry, size, age and parent country's GDP growth rate

# Theoretical Predictions

- Lower US rate of return and higher US interest if tax rate differential is higher
  - Effects attenuated if parent is in worldwide country

# Identification

- With firm fixed effects, then the impact of having a worldwide or tax haven parent is identified only by firms that switch parents
- Such “switchers” can also contribute to variation in the tax rate differential, which can change if:
  - The parent’s country changes its tax rate
  - The parent’s country changes (primarily because the parent changes)

# Identification

- Since switching is not random, we may wish to exclude this source of variation, typically less than 1% of firms each year.
  - We consider both specifications, with and without switching, losing identification of worldwide and tax haven level effects in the latter case.

# Results

- First question: do we have to use fixed effects?
  - Hausman tests strongly reject equality of random-effects and fixed-effects specifications
  - We will start with the random effects approach simply as a bridge to earlier work based primarily on cross-section analysis (or on panel data analysis that does not control for firm fixed effects)
- Note: All regressions include control variables for industry, size, age and parent country's GDP growth rate

# Table 1: Random effects, full sample

- Dependent variable = rate of return

	Coefficient	z
Tax rate difference	-.0583	-3.85
Haven	-.0032	-0.70
Worldwide	-.0339	-12.19
Worldwide* tax rate difference	.1139	2.76

# Table 1: Random effects, full sample

- Key results
  - **Tax rate difference:**  $-.06$ ; consistent with theory (a 10 percentage point reduction in foreign tax rate reduces US return by 0.6 percentage points)
  - **Worldwide \* tax rate difference**  $> 0$ , which is also consistent with theory although size is too large.
  - But **Worldwide** reduces return by  $.03$ ; not clear why this should be, but highlights possibility of unobserved firm differences correlated with having a worldwide parent

# Table 2: Random effects, full sample

- Dependent variable = interest /debt+net assets

	Coefficient	z
Tax rate difference	.0166	2.51
Haven	-.0011	-0.59
Worldwide	.0105	9.99
Worldwide* tax rate difference	-.1862	-9.64

- Key results
  - Get + sign on **tax rate difference**, consistent with theory
  - **Worldwide \* tax rate difference** effect is negative, which is correct sign, but, again, a very large effect

# Summary of RE Runs

- **Tax rate difference** and **Worldwide\*tax rate** difference both have correct signs.
- **Worldwide** alone has strong effects in both cases, consistent with view that something else might be different about these firms.
- So, move on to fixed effects runs, first continuing to use full sample including switchers.

# Table 3: Fixed effects, full sample

- Dependent variable = rate of return

	Coefficient	z
Tax rate difference	-.0605	-3.04
Haven	-.0008	-0.11
Worldwide	-.0123	-2.36
Worldwide* tax rate difference	-.0253	-0.51

- Key results:
  - **Tax rate difference** largely unaffected
  - **Worldwide**: still negative, but much less so
  - **Worldwide\*tax rate difference** now insignificant

# Table 4: Fixed effects, full sample

- Dependent variable = interest /debt+net assets

	Coefficient	z
Tax rate difference	-.0006	-0.05
Haven	.0074	1.78
Worldwide	.0007	0.23
Worldwide* tax rate difference	-.0638	-2.17

- Key results:
  - **Tax rate difference** now 0
  - **Worldwide\* tax rate difference** still negative, but less so
  - **Worldwide** now 0
  - **Haven** effect now greater  $>0$

# Summary of FE Runs

- **Tax rate difference** significant now only for total returns
- **Tax rate difference \* Worldwide** still significant w/correct sign in interest regression
- Anomalous **Worldwide** effects reduced
- **Tax haven** effect on interest appears
  
- But, may still worry about influence of switchers, so now look at FE runs w/o switchers.

# Table 5: Fixed effects, w/o switchers

- Dependent variable = rate of return

	Coefficient	t
Tax rate difference	-.1147	-2.85
Worldwide* tax rate difference	.0043	.05

- Key results:
  - **Tax rate difference** roughly double in size
  - **Worldwide\*tax rate difference** still insignificant

# Table 6: Fixed effects, w/o switchers

- Dependent variable = interest/ debt+net assets

	Coefficient	t
Tax rate difference	-.0217	-0.90
Worldwide* tax rate difference	- .1010	-1.92

- Key results:
  - **Tax rate difference** insignificant
  - **Worldwide\*tax rate difference** still marginally significant, with right sign

# Summary

- With most plausible specification (FE w/ no switchers), get two significant effects, **tax rate difference** in rate of return regression, and **WW\*tax rate difference** in interest regression, both with correct sign
- Next steps:
  - Add data back to 1986, to get much more variation in tax rates
  - Consider a richer set of specifications, including lags