Part II - Methods
MNEs vs comparable non-MNE profit shifting

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Suggested methods – Aggressive tax avoidance / profit shifting

#4 MNEs vs comparable non-MNE profit shifting
Aggressive tax avoidance or profit shifting by MNEs: MNEs vs comparable non-MNE profit shifting

- Concept and assumptions
  - Deviation from normality: domestic firms vs MNEs

![Graph showing comparison between Multinational enterprises vs. non-multinational enterprises, 2015 (%).](image)

- Phase 1: Identify tax-avoiding MNEs
  - Between MNEs and non-MNEs
  - Within MNEs

- Phase 2: Measure profit shifting
  - Declared vs should-have-been declared

- Vertical strategy: MNEs’ units in a selected country only

Source: Sallusti (2021)
Limitations
- Differences between two groups driven by other factors
- Smaller economies
- Matching variables as ratios
- Either outward or inward IFFs

Overcoming limitations
- Control group into same size class
- Compare MNE units to average of domestics firms
- Compare all MNE units to all domestic firms
- Domestic firms and MNE units in the same size-class
- Include size of assets (data permitting)
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• Source data
  – Microdata available to NSO
  – Economic and structural variables (value added, R&D spending, salaries/costs…)
  – Structural business statistics
  – Administrative data on taxable profits
  – International trade, position within MNEs, FATS, LCU

• Calculation – Phase zero: country
  – Identification of either inward or outward IFFs
  – Tax practices, macroeconomic variables…
• Calculation – Phase zero: country

Relative size of Canadian outward FDI and of GDP for ten countries with highest stocks of Canadian FDI, 2016

Source: Fortier-Labonté and Schaffter (2019)

• Calculation – Phase zero: country

BEPS Indicator 1B: Mismatches between assets, employment and sales for countries with favourable corporate tax rates.

• In countries with favourable corporate tax rates: 23 employees per billion dollars of assets.
• For other countries: 270
• -> investment in countries with favourable corporate tax rates not driven by real economic factors
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• Calculation – 1. Identification phase
  – *Between comparison*
  – Propensity score (PS) matching
  – Characterization based on variables: territory, economic activity, employment, internationalization, structure of costs and revenues…
  – Proxy to determine abnormal behaviour:
    • $Proxy=1$ (suspect, or indicator of “abnormality”):
      EBIT-to-turnover ratio < average of the control group
    • $Proxy=0$ (no suspect):
      EBIT-to-turnover ratio $\geq$ average of the control group.

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• Calculation – 1. Identification phase
  – *Within comparison*
  – Receiver operating characteristics (ROC)
  – Starting from proxy from previous step and defines final clustering
  – Classifier – composite indicator:
    • ratios to turnover of EBIT, VA, R&D spending, Exports;
    • Ratios to total costs: royalties, salaries, services, imports
    • …
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• Calculation – 1. Identification phase
  – Within comparison
  – Composite indicator by stratum

\[ I_i = \omega_1 \left( \sum_{j} y_{j,1} x_{j,i} \right) + \omega_2 \left( \sum_{j} y_{j,2} x_{j,i} \right) \]

\[ y_{j,1}, y_{j,2} \ldots \text{loadings of variable } j \text{ in factors 1 and 2} \]
\[ x_{j,i} \ldots \text{value of variable } j \text{ for observation } i \]
\[ \omega \ldots \text{weights in term of explained variance} \]

• Calculation – 1. Identification phase
  – Within comparison
  – Logit model:
    • Dependent: suspect \( (Proxy=1) \)
    • Explanatory variable: composite indicator

  – Threshold observation identified for each stratum: \( \bar{I} \)
    • \( I_i < \bar{I} \) – MNEs considered as tax avoiding
    • \( I_i \geq \bar{I} \) – MNEs considered as non-tax avoiding
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- Calculation – 2. Measurement phase
- For each tax-avoiding MNE from previous phase
- Profit shifted = theoretical profits – declared profits
- Adjusted value of EBIT-to-turnover ratio ($\bar{x}_{h,i}$):
  - Increasing the ($x_h$), keeping the other variables ($x_{-h}$) unchanged so as to obtain $I_i = \bar{I}$

$$\bar{x}_{h,i} = \frac{I - (\omega_1 \sum_{h} y_{-h,1} x_{-h,2} + \omega_2 \sum_{h} y_{-h,2} x_{-h,2})}{\omega_1 y_{h,1} + \omega_2 y_{h,2}}$$

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- Calculation – Outward IFFs

$$OutwardIFF_{i} = (\bar{x}_{h,i} - x_{j,i}) \times Turnover_i$$

$x_i$ ... the declared value of EBIT to turnover ratio;
$\bar{x}_{h,i}$ ... the threshold value of the EBIT to turnover ratio in order to be classified as non-tax avoiding MNE.
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- Calculation – Inward IFFs
- Inflows of profits -> MNEs higher levels of profits than “normal” levels of similar non-MNEs
- Focus on structure of revenues, not so much costs
- Inverse relation of structural characteristics with “suspect”

1. Identification phase: between:
   - Proxy=1 (suspect, or indicator of “abnormality”): EBIT-to-turnover ratio > average of the control group

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- Calculation – Inward IFFs
- 1. Identification phase: within:
- Classifier – composite indicator:
  - Reversed signs of EBIT-to-turnover, VA-to-turnover…
  - Royalties- and services-to-turnover (not costs)
  - … see Box 5 of Guidelines
Aggressive tax avoidance or profit shifting by MNEs: MNEs vs comparable non-MNE profit shifting

- Calculation – Inward IFFs
- 2. Measure
- $x_{j,i}$ for MNEs that are considered as collecting BEPS from other countries should be higher than $\bar{x}_{h,i}$

\[
\text{InwardIFF}_{s_i} = -(\bar{x}_{h,i} - x_{j,i}) \times \text{Turnover}_i
\]