Measuring BEPS: MNEs vs. comparable non-MNEs method – method #4

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According to the UNCTAD/UNODC definition, BEPS is included in practices considered as generating Illicit Financial Flows (IFFs).

SDG target 16.4 claims for significantly reduce illicit financial and arms flows by 2030.

SDG indicator 16.4.1 should monitor the total value of inward and outward illicit financial flows (in current United States dollars).

Measuring BEPS represents a part of this more comprehensive task.

MNEs vs. comparable non-MNEs is a method to estimate the amount of BEPS in a given country (either BEPS generating or BEPS collecting, i.e. considering either outward or inward IFFs).

- The method is bottom-up and measures BEPS starting from microdata.
- Differently from other bottom-up approaches (proportionary apportionment, indicator of misalignment profits), the method exploits only the information about domestic enterprises, which is generally available for NSOs.
The database for the analysis of the Italian case is composed of three data sources:

- The archive **Frame-SBS** (Structural Business Statistics), which includes the information about the structure and economic variables for the whole set of 4.4 millions of firms.
- The archive **COE-TEC** (Integrated International Trade Database), which includes the information about imports and exports (by product and origin/destination Country) for the whole set of firms.
- The archive **ASIA-Groups** (Italian version of European EGR), which includes the information about firms involved in domestic and foreign groups.

For each unit in the business system, the final database reports comprehensive information about:

- The economic and organizational structure.
- The characteristics of its inclusion in the network of international trade.
- If applies, the positioning within MNE groups.
MNE vs. comparable non-MNE method – Overview

- MNE vs. comparable non-MNE method is composed by three phases:

  1. The **identification** of the either BEPS generating (outward IFFs) or BEPS collecting (inward IFFs) nature of the Country (OECD’s dashboard approach of BEPS indicators)

  2. The **selection** of tax avoiding units among MNEs
     - Italian MNEs are evaluated in order to identify abnormal behaviours (tax avoidance) based on a double comparison: «between» MNEs and comparable non-MNEs and «within» MNEs themselves

  3. The **correction** of profits for tax avoiding MNEs
     - The EBIT-to-turnover ratio of tax avoiding MNEs is adjusted exploiting the selection model in order to bring the economic results of tax avoiding MNEs to the one of non-tax avoiding MNEs
The phase of selection is composed of three steps:

- **Identification of the control group**: For each MNE unit, a control group of domestic firms is defined using Propensity Score Matching.
- **«Between» comparison**: For each pair MNE unit-control group, a comparison in terms of profit share is used to define a proxy variable, which stresses possible abnormal behaviours by MNEs.
- **«Within» comparison**: ROC analysis is used to define the final clustering between tax avoiding and non tax-avoiding MNEs starting from the proxy variable.
The control group for each MNE is defined using Propensity Score Matching.

This allows to define the *n domestic units that are more similar to each MNE* based on the following set of characteristics:

- **Region** (Nuts 2)
- **Industry** (3-digits Nace)
- **Size class**
- Per capita turnover
- Persons employed
- Share of goods and services on total costs
- Export-to-turnover ratio
- Import-to-cost ratio
- Share of salaries on total costs
- Share of services on turnover

For each pair MNE unit-control group, a proxy of suspect of TA is given by the following condition:

- **Suspect = 1**
  
  if EBIT-to-turnover ratio for the MNE unit is lower than the average of the control group

- **Suspect = 0**
  
  if EBIT-to-turnover ratio for the MNE unit is greater or equal to the average of the control group.
For MNE units, to refine the classification, a ROC analysis is carried out using a composite indicator that takes into account a set of variables on the structure of costs and revenues, and the tax differential with other countries according to the BEPS generating or BEPS collecting nature of the Country (Italy BEPS generating):

**BEPS generating country** (outward IFFs)
- EBIT-to-turnover ratio
- Value added-to-turnover ratio
- R&D spending
- Share of royalties on total costs
- Average taxation on productive income in foreign countries
- Share of salaries on total costs
- Share of services on total costs
- Export-to-turnover ratio
- Import-to-costs ratio

**BEPS collecting country** (inward IFFs)
- EBIT-to-turnover ratio (reversed)
- Value added-to-turnover ratio (reversed)
- R&D spending
- Share of royalties on turnover
- Average taxation on productive income in foreign countries (reversed)
- Share of salaries on total costs
- Share of services on turnover
- Export-to-turnover ratio
- Import-to-total cost ratio

ROC analysis allows defining a cut-off over the value of the composite indicator, which permits to cluster MNEs into tax avoiding and non-tax avoiding, adjusting the classification derived from the proxy variable.
The correction for BEPS exploits the information provided by the ROC analysis in the selection phase.
• $\tilde{x}_{j,i}$ is the adjusted value of the EBIT-to-turnover ratio in order to bring tax avoiding MNEs on the threshold

• The amount of adjustment will depend on:
  • The position of the threshold that is connected with market and technological characteristics
  • The relative weight of the variables (other than EBIT-to-turnover ratio) in the definition of the composite indicator
  • The weight of the EBIT-to-turnover ratio on the value of the composite indicator

• The final amount of the adjustment in terms of profits is obtained as: $(\tilde{x}_{j,i} - x_{j,i}) \times \text{Turnover}_i$
Measuring (outward and inward) IFFs

- The amount of correction also represents the measure of IFFs. In particular:

\[
\text{Outward IFFs}_i = (\tilde{x}_{h,i} - x_{j,i}) \times \text{Turnover}_i
\]

where \(\tilde{x}_{h,i} > x_{j,i}\)

\[
\text{Inward IFFs}_i = -(\tilde{x}_{h,i} - x_{j,i}) \times \text{Turnover}_i
\]

where \(\tilde{x}_{h,i} < x_{j,i}\)
• In the Italian pilot, 60.4% of MNEs are found to be tax avoiding, the total amount of BEPS is 32 billion euros (around 2% of GDP)
• The distribution of BEPS is highly correlated with the location in low-tax Countries of the group
• Data have been presented at the WPNA but have not be published yet. Currently, the analysis is considered as a pilot study
• Open issues:
  • The lack of information about foreign enterprises (which is unavailable or very costly, e.g. bureau Van Dijk)
  • The difference between MNEs and non-MNEs can be connected with other factors that cannot be captured by Propensity Score Matching
  • Some relevant variables related to the financial statement (debt, immaterial assets) are missing for branches or un-incorporated enterprises
Thank you.