

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

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# Introduction

- 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

# MNE vs. comparable non-MNE method – Data source

- 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

# MNE vs. comparable non-MNE method – Selection

- 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

# MNE vs. comparable non-MNE method – Selection

- 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

# MNE vs. comparable non-MNE method – Selection

- **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



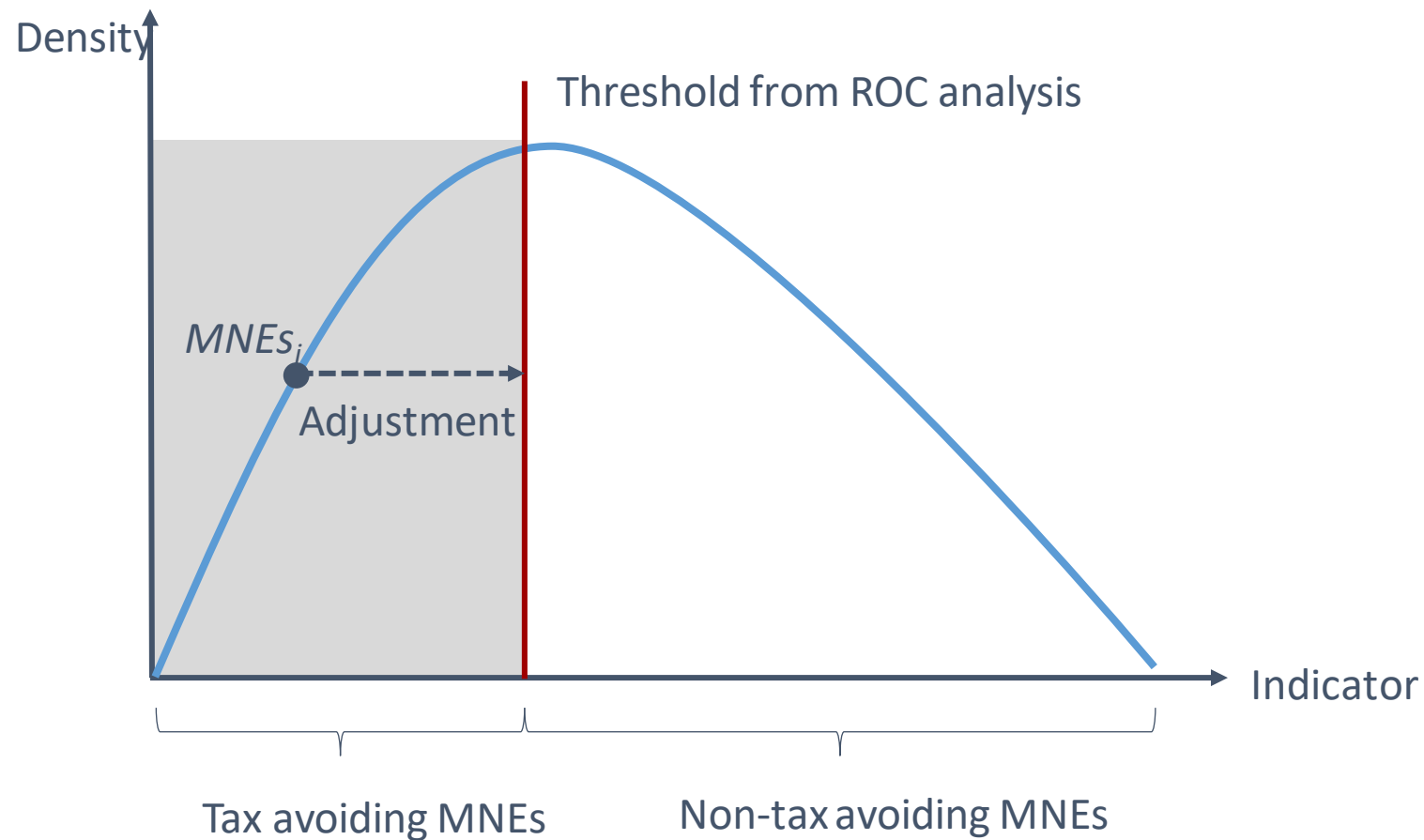
Composite indicator

- 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



# MNE vs. comparable non-MNE method – Correction

- The correction for BEPS exploits the information provided by the ROC analysis in the selection phase



## MNE vs. comparable non-MNE method – Correction

- $\tilde{x}_{j,i}$  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:  $(\tilde{x}_{j,i} - x_{j,i}) * \textit{Turnover}_i$

# Measuring (outward and inward) IFFs

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

**BEPS generating country**

$$OutwardIFFs_i = (\tilde{x}_{h,i} - x_{j,i}) * Turnover_i$$

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

**BEPS collecting country**

$$InwardIFFs_i = -(\tilde{x}_{h,i} - x_{j,i}) * Turnover_i$$

where  $\tilde{x}_{h,i} < x_{j,i}$

# Results, dissemination and open issues

- 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.