

# The Impact of Offshore Profit Shifting on the Measurement of GDP: The Case of the UK

Giordano Mion & Manuel Tong

Starting at 11.30 AM

**ESCoE ECONOMIC MEASUREMENT WEBINARS**



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The Case of the UK

Giordano Mion and Manuel Tong

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# Outline

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4. Apportionment Rule
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# Introduction

## Multinational Enterprises (MNEs):

- Intangible assets located everywhere.
- Access to multiple heterogeneous tax locations (via subsidiaries).

MNEs can assign assets in a more ‘profitable’ way:

→ Breaking link between value creation and value declaration.

→ Mismeasurement of MNEs activities and contribution to GDP in their resident countries.

## Guneven et al. (2017) on US MNEs re-allocating profits:

- “Missing” \$ 3.6 trillion of GDP, 1994-2014.
- 1.5 percentage point to cumulative productivity growth.

# Introduction

## This paper:

- Applies insights from Guneven et al. (2017) to the UK context.
- Focuses on both UK and non-UK MNEs operating in the UK.
- Detailed country and industry breakdown of “losers” and “winners” of offshore profit shifting, 2007-2017.

## Results overview:

→2017: UK, net winner. GBP 41 billion (1.91% of UK GDP).

→2007: UK, net loser. GBP – 28 billion.

→Major contributors (2017): Crude petroleum and natural gas; mining of metal ores; telecommunications, pharmaceuticals; coke and refined petroleum products.

# Data

## ORBIS Financial Dataset

### Industry - Global financials and ratio - USD

- All industrial firms: both manufacturing and non-manufacturing.
- Financial firms (banks, insurance companies) excluded.
- Around 200 countries. European countries, better represented.
- Variables: balance sheet items, income statement items and some derivative financial ratios.

Source: ORBIS

## ORBIS Ownership Links Dataset

### Links (year)

- Information on the links between a firm and its owner(s) (shareholder(s)) in each year.
- Types of relation:
  - Simple shareholder
  - Domestic ultimate owner
  - Global ultimate owner
- More than one observation per firm, depending on number of owners.
- Records percentage of ownership per firm's owner.
- Distinguishes if firms' owner is a corporation: bank, financial, insurance or industrial company.

Source: ORBIS

# Data

## Variables retained from the ORBIS financial dataset:

- Fixed assets (intangible, tangible, others).
- Liabilities (current, non-current, long-term debt).
- Number and **costs of employees**.
- Operating revenue (**turnover**).
- Interest, costs of goods sold, operating profits and losses.
- **Financial revenues and expenses.**
- **Financial profits and losses before taxes.**

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	30/09/2018 USD	01/10/2017 USD	03/10/2016 USD	27/09/2015 USD
Exchange rate: GBP/USD	12 months Unqualified Local GAAP 1.30410	12 months Unqualified Local GAAP 1.33840	12 months Unqualified Local GAAP 1.29610	18 months Unqualified Local GAAP 1.51990
Operating revenue (Turnover)	229,686,008	226,818,927	216,089,664	186,502,580
L. Sales	n.a.	n.a.	n.a.	n.a.
Costs of goods sold	90,530,666	97,905,273	73,271,126	83,230,671
Gross profit	139,155,342	128,914,654	142,818,537	93,271,708
Other operating expenses	106,151,183	93,186,000	86,530,006	89,117,456
Operating P/L (+EBIT)	33,004,179	35,747,316	56,288,531	24,154,252
Financial P/L	221,540,615	176,803,932	161,950,290	661,648,904
L. Financial revenue	221,794,527	176,813,301	161,951,596	661,662,663
L. Financial expenses	224,505	8,369	1,296	13,679
P/L before tax	254,544,794	212,551,248	218,230,841	685,803,236
Taxation	22,378,367	5,874,296	3,376,341	15,103,247
P/L after tax	232,166,427	206,677,012	214,854,500	670,699,989
Extr. and other P/L	n.a.	n.a.	n.a.	n.a.
L. Extr. and other revenue	n.a.	n.a.	n.a.	n.a.
L. Extr. and other expenses	n.a.	n.a.	n.a.	n.a.

# Data Cleaning, Matching and Processing

## Objective:

- To construct a panel dataset merging balance sheet data with ownership links of all subsidiaries belonging to multinational enterprises (MNEs) with any presence in the UK, for the 2007-2017 period.

## To have in mind:

→ We started with data on UK firms from 2007 and 2017.

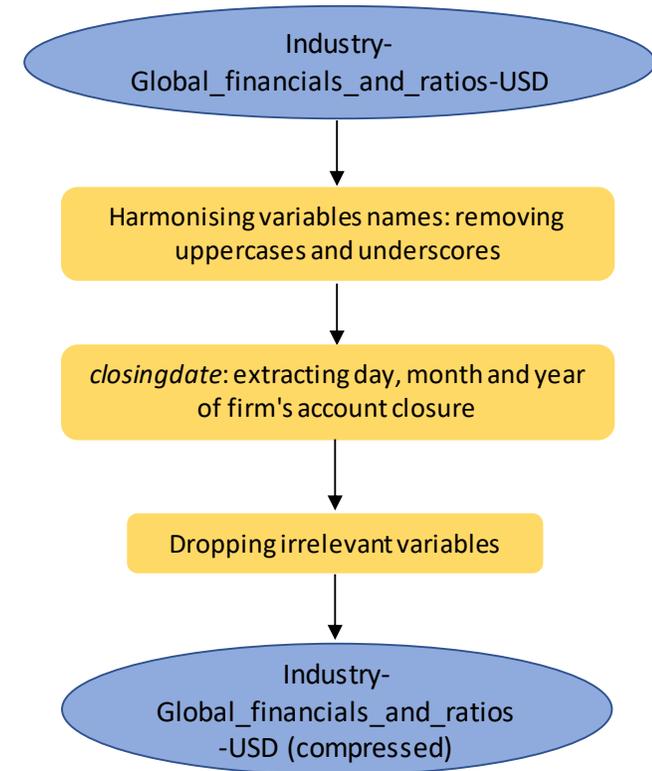
→ After gaining confidence on the data, we proceeded with years in between and the rest of countries.

# Data Cleaning, Matching and Processing

## Balance Sheet Data: Relevant Variables

- Apart from those mentioned earlier...
- *bvdidnumber*: firm's identification code.
- Firm account's closing year, month and day.
- Consolidation code.
- Account's type of filing.
- Number of months covered by account.
- Original currency, units and exchange rate.

## Processing per Country/Year



Own elaboration

# Data Cleaning, Matching and Processing

## Consolidation Codes:

- *C1*: consolidated account (mother + subsidiaries) w/o unconsolidated.
- *C2*: consolidated account w/ unconsolidated.
- *U1*: unconsolidated account (only the firm concerned) w/o consolidated.
- *U2*: unconsolidated account w/ consolidated.

## Account's Types of Filing:

- *AR*: annual report.
- *LRF*: local registry filing.

## Some Statistics – UK:

- 90% observations correspond to U1 accounts.
- Most AR-based accounts are C1.
- Closing month (UK, 2017): Over 40% accounts closed in March (24.11%) or December (17.93%).
- Number of months covered:
  - Over 90% accounts cover 12 months (2007 and 2017).
  - Between 3% and 6% cover more than a year.
  - Accounts covering 12 months make up to 96.66% of total turnover in 2017 (94.64% in 2007).

# Data Cleaning, Matching and Processing

## Balance Sheet Data – Dropping Duplicates

“Go-backwards” strategy, examining duplicates across levels of disaggregation, until getting to one observation per firm-year.

### Main sources of duplicates:

- Account’s closing day —————> latest day preferred.
- Number of months covered —————> most months preferred.
- Type of filing —————> AR accounts preferred.
- Account’s closing month —————> latest month preferred.
- Consolidation code (most cumbersome source) —————> C1 preferred over C2, and U1 preferred over U2.

# Data Cleaning, Matching and Processing

## Ownership Data: Parents and Affiliates

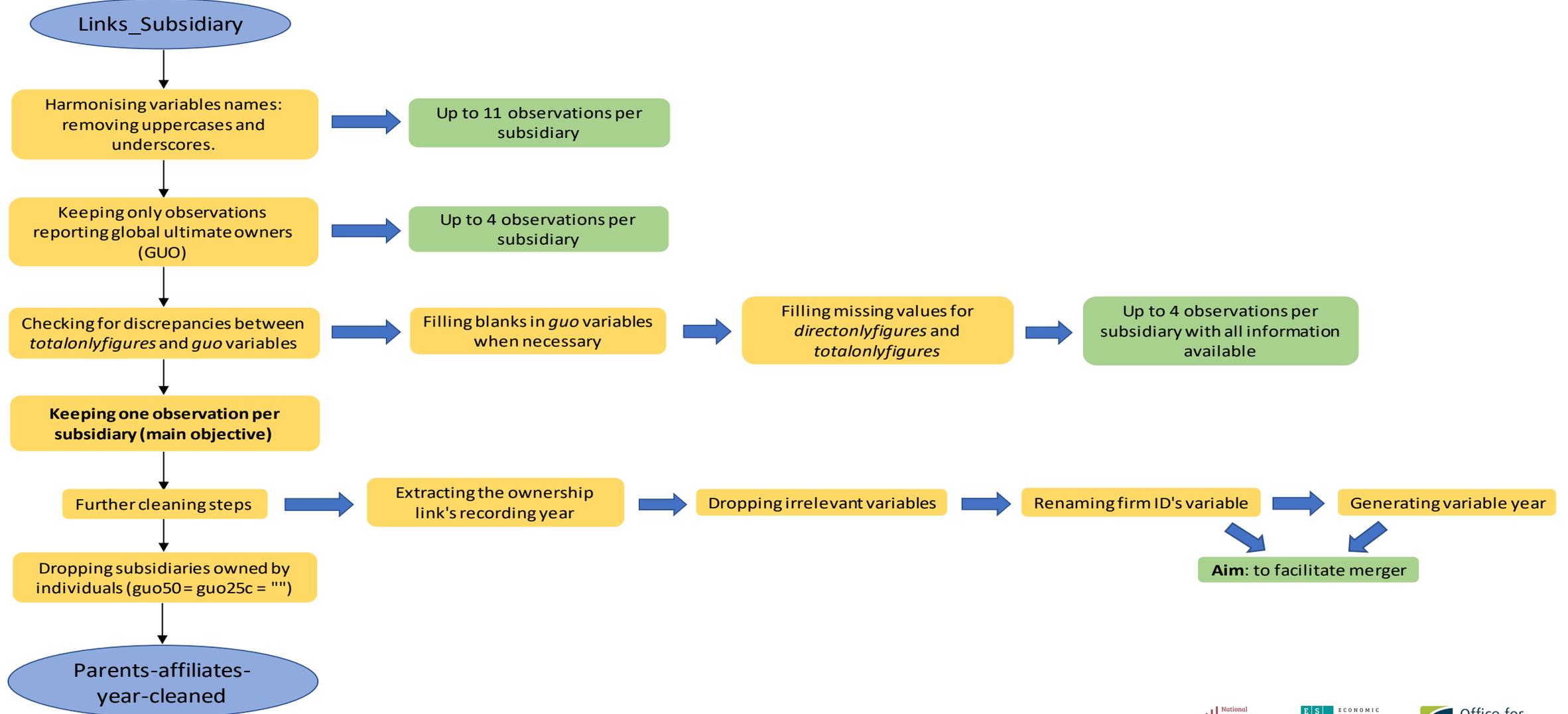
- One dataset per country/year.
- Up to 11 observations per subsidiary.

### Main types of ownership:

- *GUO25*: global ultimate owner, minimum 25% ownership.
- *GUO50*: global ultimate owner, minimum 50% ownership.
- *GUO25C*: corporate global ultimate owner, minimum 25% ownership.
- *GUO50C*: corporate global ultimate owner, minimum 50% ownership.

# Data Cleaning, Matching and Processing

## Ownership Data: Parents and Affiliates



# Data Cleaning, Matching and Processing

## Merging Industry Balance Sheet Panel with Ownership

- Two final datasets for the UK (2006-2007 and 2016-2017)
- Replicate the whole process for the other countries in ORBIS data.

## Crossing Information Across Countries

- From the UK merged dataset, keep the list of GUO50C parent companies.
- Merge this list with the merged panels of each country (iteration across countries).
- Final Result: appended panels of firms from all over the world, belonging to MNEs with any presence in the UK, 2006-2007 and 2016-2017.
- Replicate the process for 2008-2009, 2010-2011, 2012-2013 and 2014-2015.

# Apportionment Rule

## Objective:

- To investigate how the profit distribution within each MNE group would be if profits were linked to local economic activity.

## Apportionment Factors:

- Operating revenue (turnover).
- Cost of employees (for robustness).

## Limitations:

- We only work with unconsolidated accounts within each MNE group. Parent companies, usually filing only consolidated accounts, are discarded.
- However, U1 accounts: 89.4% of MNE's C1 fixed assets, 54.8% of revenues, 28.3% of operating profits, and 58.3% of financial profits before taxes (2017).
- **Evidence of profit shifting from MNE parents to subsidiaries before taxes.**

# Apportionment Rule

For each subsidiary  $i$  belonging to MNE  $j$ , we retrieve:

- Profits before taxes:  $PBT_i$
  - Aggregate MNE  $j$  profits:  $PBT_j = \sum_{i \in j} PBT_i$
  - Re-assign profits across subsidiaries  $i$ , based on revenue shares within MNE groups  $j$ :  
 $share_i = \left( \frac{revenue_i}{\sum_{i \in j} revenue_i} \right)$
  - Counterfactual profits before taxes:  $PBT_{c_i} = share_i * PBT_i$
- ✓ Aggregate counterfactuals per location country. So, for the UK:  $PBT_{c_{UK}} = \sum_{i \in UK} PBT_{c_i}$
- ✓ Compare with actual UK aggregate PBT:  $PBT_{UK} = \sum_{i \in UK} PBT_i$

**If  $PBT_{UK} > PBT_{c_{UK}}$   $\longrightarrow$  UK, Net Winner**

# Main Results

Indicator (U1 accounts only)	UK (GBP)	Global (GBP)
Sales (2017)	2,658 billion	19,140 billion
Operating Profits (2017)	189 billion	881 billion
Profits Before Taxes (2017)	499 billion	1,495 billion
PBT – OP (2017)	310 billion	614 billion
PBT – OP (2007)	307 billion	612 billion

- $PBT - OP > 0$   $\longrightarrow$  MNEs transfer profits from parents to subsidiaries.
- How would PBTs be counterfactually distributed across companies (countries), if profits proportional to sales?

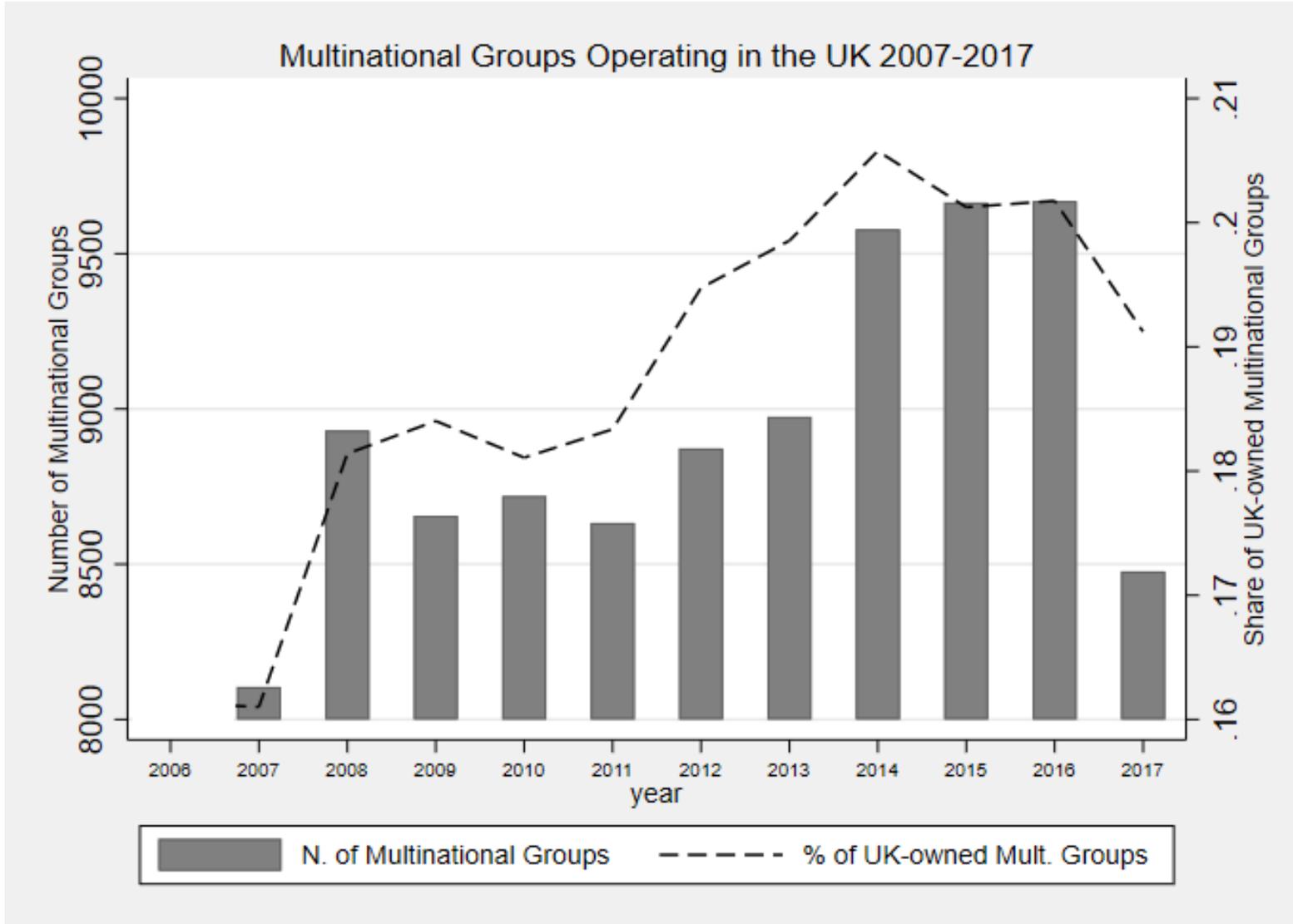
# Main Results - UK

Indicator (U1 accounts only)	2007 (GBP)	2017 (GBP)
$PBT_{UK}$	83 billion	499 billion
$PBT_{cUK}$	107 billion	458 billion
$PBT_{UK} - PBT_{cUK}$	-24 billion	41 billion (1.91% of UK GDP)
<b>Profit-shifting result</b>	<b>Net loser</b>	<b>Net winner</b>

## General countries' results (2017):

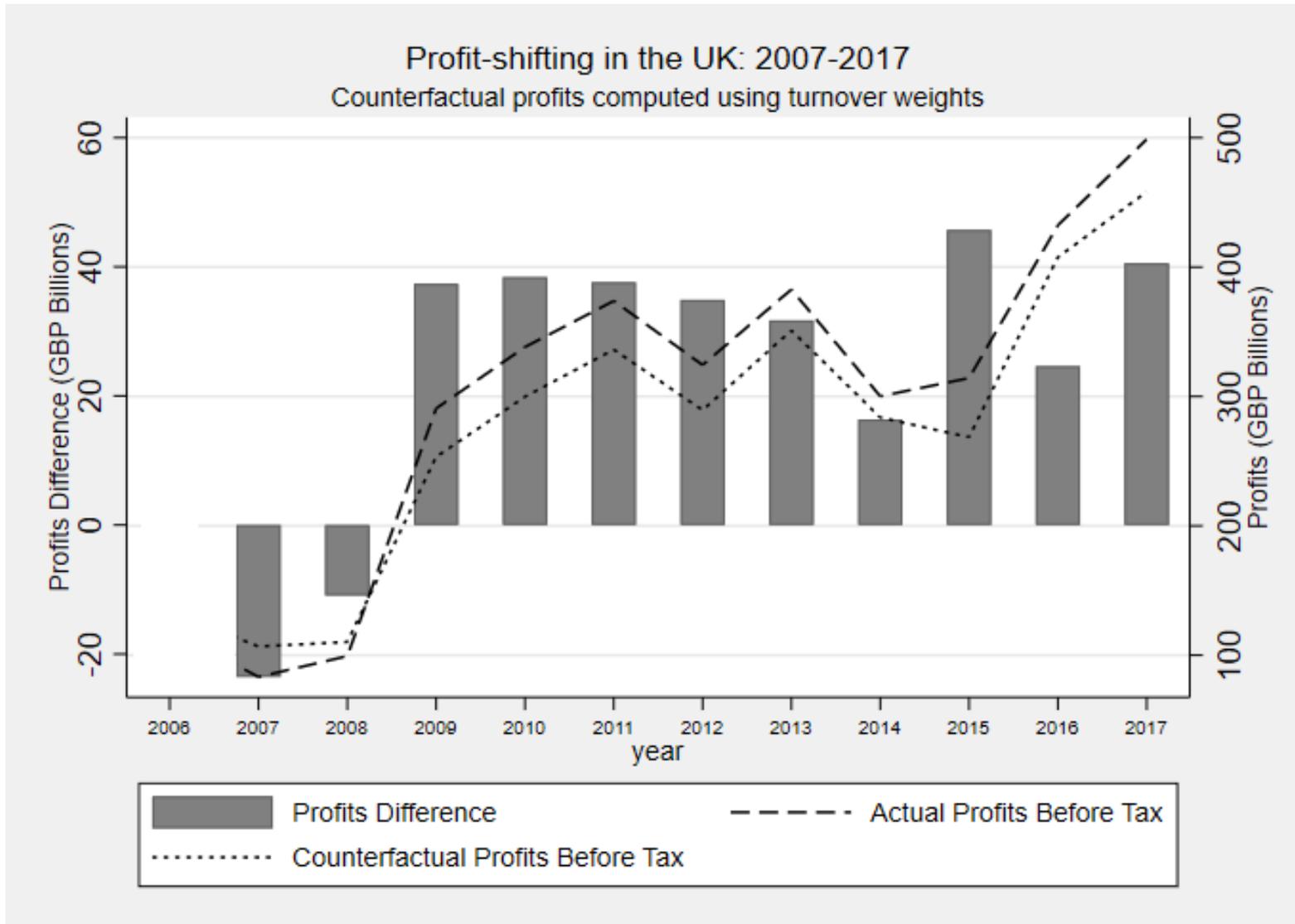
- Top winners: Netherlands, UK and Luxembourg.
- Top losers: Singapore, Belgium and Italy.

# Main Results - UK



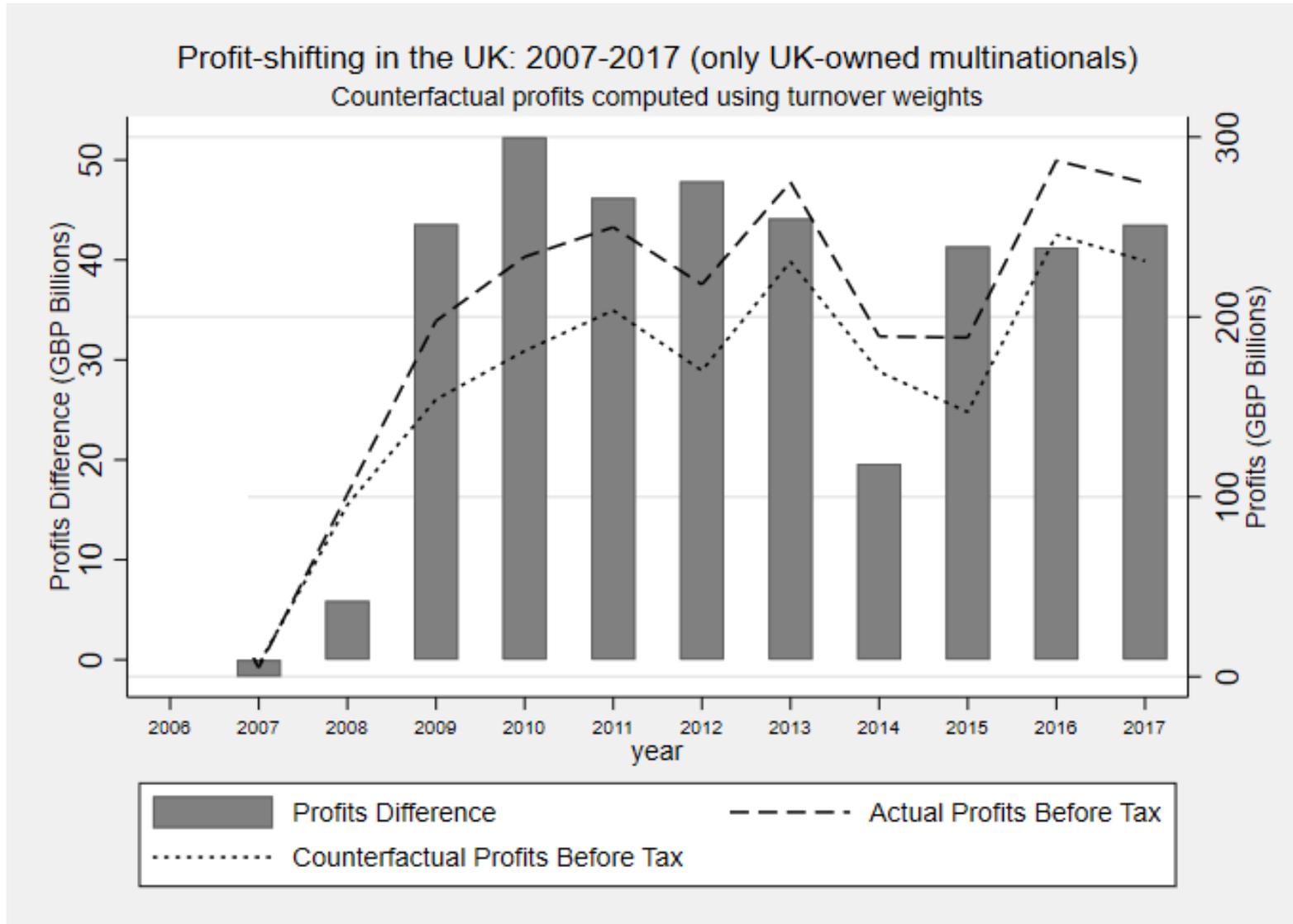
- 8,000 - 9,500 MNE groups operating in the UK.
- 16% - 20% owned by a UK parent.

# Main Results - UK



- Positive balance of around GBP 40 billions since 2009.
- Profit-shifting reversed in 2009, from a losing to a winning position.

# Main Results - UK



- UK-owned MNE groups are the main drivers of positive balances since 2009.

# Main Results – Industry Patterns UK (2017)

## Top 5 Contributors (2-digit NACE Rev 2):

- Extraction of crude petroleum and natural gas: GBP 7.744 billion.
- Mining of metal ores: GBP 6.842 billion.
- Telecommunications: GBP 6.364 billion.
- Manufacture of basic pharmaceutical products and pharmaceutical preparations: GBP 6.188 billion.
- Manufacture of coke and refined petroleum products: GBP 5.883 billion.

## Bottom 3 Contributors:

- Financial service activities: GBP -8.775 billion.
- Manufacture of basic metals: GBP -3.681 billion.
- Manufacture of machinery and equipment: GBP -2.181 billion.

# Robustness Checks

- Missing data: 2017 ownership links with 2016 balance sheet data, and so forth.
  - UK still net winner in 2017: GBP 25 billion.
- Apportionment by cost of employees.
  - UK net loser in 2017: GBP -5.7 billion.
- Only U1 accounts belonging to a MNE holding a C1 account.
  - UK net winner in 2017: GBP 69 billion.
  - UK net loser in 2007: GBP -13 billion.
- Crown Dependencies and branches.
  - UK still net winner in 2017: GBP 38 billion.
- Special Purpose Entities (SFP) and Family Trusts (FT).
  - Not possible to identify them at ORBIS.

# Conclusions

- Global distribution of profits declared by MNEs operating in the UK, using ORBIS data.
- Unconsolidated accounts of firms belonging to corporate GUOs (2007-2017).
- MNEs operating in the UK reported in 2017 GBP 41 billion more (1.91% of UK GDP) than they would have if profits allocated across companies based on revenues.
- UK moved from a net losing to winning position from 2007 to 2017, mainly through profits from UK-owned MNEs.
- Further research:
  - Study comparability of MNEs data from ORBIS to more standard national account sources.
  - Experiment with ownership degrees by corporate GUOs: 10%, 25%, etc.



# Thank You!

Giordano Mion and Manuel Tong

28<sup>th</sup> January, 2021

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Thank you

