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Giordano Mion and Manuel Tong

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DISCUSSION PAPER

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Keywords: profit shifting; intangible assets; ORBIS; apportionment, subsidiary, associate

JEL classification: E01, F23

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THE IMPACT OF OFFSHORE PROFIT SHIFTING ON THE MEASUREMENT OF GDP: THE CASE OF THE UK. FURTHER ANALYSIS¹

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Abstract

In this paper, we present additional figures and results with respect to Mion and Tong (2021) using an extended sample. More specifically, in Mion and Tong (2021) we focused on MNEs with at least one affiliate located in the UK while imposing a 50% ownership threshold in each step of an ownership chain to assign membership of a firm to an MNE group. Using the language of the IMF Balance of Payments and International Investment Position Manual (Version 6), we thus considered only MNEs' subsidiaries while leaving associate relationships, i.e., relationships involving in between 10% and 50% of ownership, aside. In extending the analysis to associate relationships, we find that the net position of the UK in terms of those who gained or did not gain from our profit shifting exercise is largely unaffected in both 2007 and 2017. At the same time, the number of associate relationships is small compared to the number of subsidiary relationships in our data. In terms of the quantitative importance of associate relationships, for example in terms of share of overall revenues and profits within an MNE group, the situation is very different in 2007 compared to 2017. While back in 2007 associate relationships were quite sizeable in terms of overall MNE group revenues and profits, by 2017 their quantitative importance had become negligible.

Keywords: profit shifting; intangible assets; ORBIS; apportionment, subsidiary, associate.

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1. Introduction

Multinational enterprises (MNEs) operating across many countries are characterised by two distinct features:

1. Their intangible assets can be located anywhere; and
2. They have access (through subsidiaries) to multiple heterogeneous tax locations.

Those features give rise to the possibility that MNEs may assign their assets in ways that are more profitable for the company, especially about legally reducing tax payments but break the link between the location where value is created and the location where value is declared, leading to, among other consequences, the mismeasurement of MNEs' contributions to the GDP in the resident country of the MNE.

In this respect, Guvenen et al. (2017) find that re-allocating USA based MNEs profits' across subsidiaries based on apportionment factors related to the level of economic activity of each subsidiary results in identifying 'missing' \$3.6 trillion of USA GDP in 1994–2014 and adds 1.5 percentage points to cumulative productivity growth in the same period. The use of the apportionment factor approach has its own drawbacks in terms of quality and precision of the proposed allocations. In Mion and Tong (2021), we applied the insights of Guvenen et al. (2017) to the UK context while complementing their analysis in several ways, including the focus on both UK and non-UK MNEs operating in the UK, as well as a detailed country breakdown of those that gained and those that did not gain through the offshore profit shifting game and its evolution over the time interval 2007-2017.

More specifically, in the above analysis we focused on MNEs with at least one affiliate located in the UK while imposing a 50% ownership (including both direct and indirect influence) threshold to assign membership of a firm to an MNE group. Using the language of the BPM 6², we thus considered only MNEs' subsidiaries while leaving associate relationships, i.e., relationships involving in between 10% and 50% of ownership (including both direct and indirect influence) aside. It is thus natural to wonder to what extent our results would be affected by the inclusion of associate relationships, and more in general, how important/pervasive associate relationships exist in MNE groups. To answer those questions, we extend our analysis to associate relationships and provide complementary results on profit shifting as well several figures to assess the quantitative importance of those relationships.

2. Key highlights from our previous analysis

In our previous analysis we focussed on being able to re-assign profits across subsidiaries within each MNE group, on firms filing unconsolidated accounts and belonging to an MNE group with at least one subsidiary in the UK.³

² IMF Balance of Payments and International Investment Position Version 6

³ MNEs parents most often file consolidated accounts covering the whole or parts of their operations and so not allowing disentangling the contribution of its comprising firms to the overall profits/losses. However, most of its subsidiaries file unconsolidated accounts and we use such unconsolidated accounts as the basis for computing aggregate profits at the MNE-level and apportion them across subsidiaries based on each subsidiary's revenue.

In doing so, we find that in the year 2017 subsidiaries located in the UK and filing unconsolidated accounts reported some £2,658 billion sales as well £189 billion of operating profits and £499 billion of profits before taxes. Globally, these figures amount to £19,140 billion in sales, £881 billion in operating profits and £1,495 billion in profits before taxes.⁴ The difference between profits before taxes and operating profits (£310 billion for companies operating in the UK and £614 billion for companies across the world) highlights how MNE groups seem to transfer, both for the UK and worldwide, operating profits away from the MNE parent and to their subsidiaries via financial transactions before paying taxes. The corresponding difference between profits before taxes and operating profits in 2007 is also positive and stands at £307 billion for companies operating in the UK and £612 billion for companies across the world.

In our previous report, we analysed how the £1,495 billion of global profits before taxes would have been allocated across companies and countries in 2017 if profits were proportional to reported firms' sales. For that purpose, we made use of an apportionment rule described in our report. As far as the UK is concerned, we obtain a total counterfactual profit before taxes of £458 billion. Compared to the actual profits of £499 billion mentioned earlier, we estimate a positive profit shifting result of £41 billion representing about 1.91% of UK GDP in 2017. This means that, by using the apportionment rule based on firms' turnover, the UK benefitted in 2017 in terms of global MNEs' profit shifting. Interestingly, in our previous report we showed that in 2007 the situation was reversed with actual reported profits (£83 billion) being smaller than counterfactual profits (£107 billion). As a result, back in 2007, the UK did not benefit in terms of global MNEs' profit shifting and we further show using data for 2009, 2011, 2013 and 2015, that the turning point for the UK was the year 2009. It is necessary to mention that the results obtained are dependent on the variable we use to apply our apportionment rule. When using the cost of employees instead of turnover, the offshore profit shifting result for the UK in 2017 turns from a positive balance to a negative one of about £5.7 billion.

3. Construction of the enlarged dataset

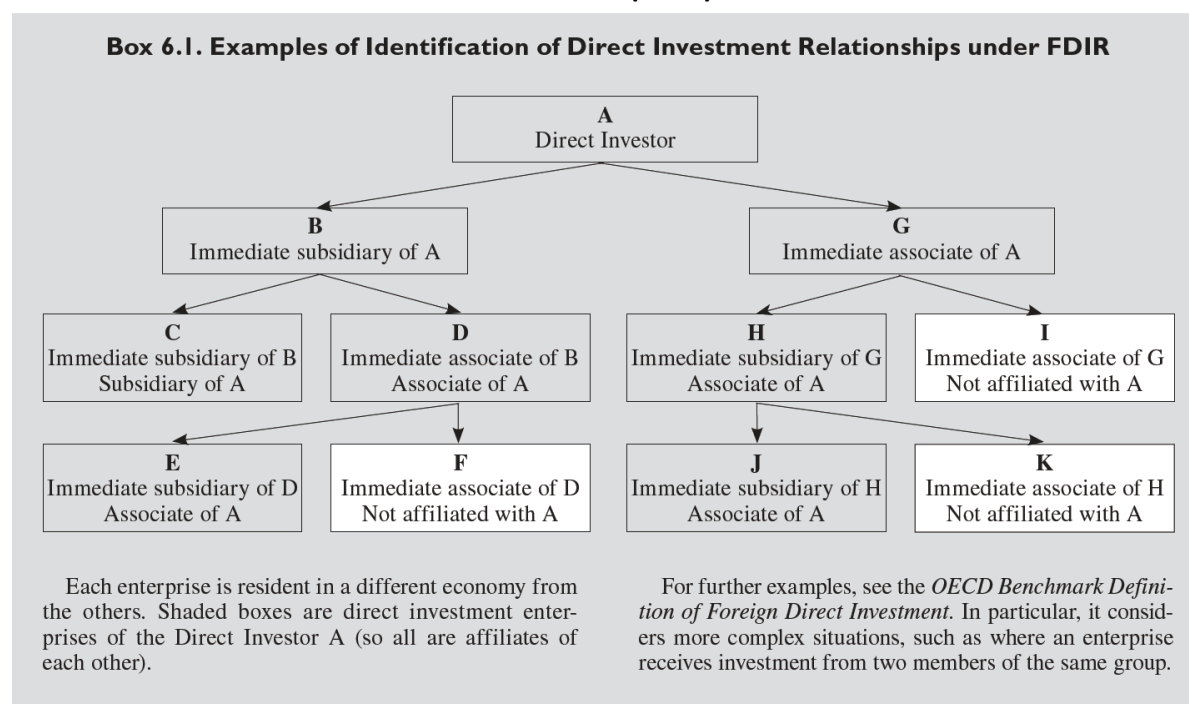
The Bureau van Dijk (BvD), which is the provider of the historical ORBIS database, already does a considerable amount of work in terms of reconstructing ownership links. They directly

One issue with this approach is that the share of profits/value pertaining to the MNE (as well as to other firms in the group filing consolidated accounts) is not considered in our analysis. To provide insights into this issue we have computed, for those MNE groups in which the main parent company files consolidated accounts, the total value of fixed assets, revenue, operating profits and profits before tax referring to firms filing unconsolidated account. We then compare those totals with the figures reported by the MNE in its consolidated accounts. Considering the year 2017, fixed assets owned by affiliate firms filing unconsolidated accounts represent 89.4% of the fixed assets reported by MNE parents in their consolidates accounts. The equivalent figures for revenue and operating profits are 54.8% and 28.3% respectively. Interestingly, regarding the latter the share increases to 58.3% when considering profits before tax, i.e., after considering those financial profits and losses that, as suggested above, include the within MNE group profits transfers we are interested in.

⁴ Our analysis has both inward and outward FDI features. In an inward FDI analysis, one would be looking at the UK operations of foreign MNEs while in an outward FDI analysis one would be considering operations across foreign countries of UK MNEs. In our analysis we cover worldwide operations of all MNEs (whether UK-owned or foreign-owned) that have some activities in the UK.

provide information on the Global Ultimate Owner Corporate (GUO50C), which is the company controlling a particular firm through a chain of ownership involving in each step more than 50% of ownership (direct and/or indirect). This fits well the definitions of control and subsidiary in direct investment relationships from the BPM 6 provided in Figure 1 below. Therefore, in our previous analysis we have used information on the GUO50C to reconstruct MNE groups.

Figure 1: Examples of direct investment relationships from the IMF Balance of Payments and International Investment Position Manual (2009)



To enlarge MNE groups to include associate relationships (See Figure 1 above) we have been forced to go back to the raw data on shareholder's participations. Furthermore, given that influence can be passed only through a chain of control but not beyond, we also need to make sure that there is a chain of control between the MNE parent and the immediate shareholder of a particular firm. This is needed to align with the concept of affiliation (either as a subsidiary or as an associate) in MNE groups from the BPM 6 (See Figure 1 above). To achieve this, we have applied the following steps in each of the years we consider (2017 and 2007):

1. We exclude from the data firms that are already included in our previous analysis because such firms are either a parent or a subsidiary of a MNE group. We also exclude firms that have a GUO50 non-corporate because of the reasons provided in our previous report.
2. For each firm, (spanning all countries in the world) we identify the set of immediate shareholders and their shares of ownership.
3. We identify the GUO50C of each immediate shareholder (to satisfy the chain of control constraint) and reconstruct the overall share of ownership of a particular firm of the (potentially many) GUO50C of the immediate shareholders.
4. We focus on ownership shares between 10% and 50% exclusively

5. We pick, among the potentially many GUO50C of the immediate shareholders, the one with the highest ownership share and assign the firm as being an associate of that GUO50C.
6. We subsequently add these associate relationships to our original subsidiary relationships dataset.
7. We restrict the analysis to GUO50C firms operating in more than one country and having at least one subsidiary or one associate in the UK (MNE groups operating in the UK).
8. We reconstruct the list of subsidiaries and associates of the MNE groups operating in the UK and cover their balance sheet information.

Three remarks are in order at this stage. First, in many cases the firm we identify as being the parent of an associate firm i corresponds to the GUO25C (an information directly provided by the BvD), i.e., a firm influencing firm i through a chain of ownership involving in each step more than 25% of ownership (direct and/or indirect). However, there are cases where we identify the parent of an associate firm i while the BvD does not report any GUO25C. This is simply because in the last step of the chain we are not imposing a 25% threshold but a lower 10% threshold. At the same time, there are cases where the BvD identifies a GUO25C for firm i while we cannot identify any associate-parent relationship for firm i . This is related to the fact that we impose in all but the last step of the ownership chain a threshold of 50% rather than the 25% used for the GUO25C.

Second, despite having several immediate shareholders, some firms do not meet the criteria we impose, for example, the share of ownership of the GUO50C with the highest share is below 10% or because none of the immediate investors has a GUO50C. Likely, these cases correspond to portfolio investments.

Third, when picking the GUO50C with the highest share, there are sometimes ties (50:50, 33:33:33, etc.). In what follows, we have discarded ties cases. In the year 2017 there are 443 firms involving ties and reporting revenues for a total of £5.4 billion, operating profits for £0.48 billion and profits before taxes of £0.38 billion. The corresponding 2017 figures in our previous report focusing on subsidiaries are £4,175 billion revenue, £200 billion operating profits and £499 billion profits before taxes.⁵ Therefore, tied cases are small in quantitative terms with respect to overall MNEs operations and it does not seem that their profits before taxes are much different from their operational profits so suggesting that they do not play any substantial role in profit shifting.

4. New results

In this section, we provide some figures about the importance of associate relationships for MNE groups operating in the UK as well as complementary profit shifting results obtained using the wider sample of subsidiaries and associates firms. We do so for the years 2017 and

⁵ Considering the year 2007, there are 911 firms involving ties and reporting revenues for a total of £4.7 billion, operating profits for £0.29 billion and profits before taxes of £0.29 billion. The corresponding 2007 figures in our previous report focusing on subsidiaries are £2,146 billion revenue, £-356 billion operating profits and £83 billion profits before taxes.

2007. With respect to the profit shifting exercise a word of caution is needed. Having an ownership share of more than 50% is a clear indicator of the capacity of the parent to affect affiliates' balance sheets strategies and potentially operate some profit shifting. However, when considering associate firms, the case is much less clear and so even more caution is needed in interpreting profit shifting results. In what follows, we treat subsidiaries and affiliates equally in terms of the counterfactual profit redistribution within each MNE group and we re-assign profits based on the revenue share within the group of each affiliate (irrespective of whether it is a subsidiary or an affiliate).

Table 1 below reports our findings (column 2: Considering Subsidiaries and Associates) while systematically comparing them with our results in the previous report (column 1: Considering only Subsidiaries). The analysis refers to the year 2017 and, as in our previous report, we focus on firms filing unconsolidated accounts.

Table 1: Summary stats and profit shifting figures referring to the year 2017 for MNE groups in the previous report (considering only subsidiaries) and the current report (considering subsidiaries and associates). Values reported in £ billion

	Considering only Subsidiaries	Considering Subsidiaries and Associates
Sales UK affiliates	4,175	4,203
Operating profits UK affiliates	200	204
Profits before taxes UK affiliates	499	505
Number of UK affiliates	39,357	40,187
Sales World affiliates	16,940	17,170
Operating profits World affiliates	890	913
Profits before taxes World affiliates	1,495	1,518
Number of World affiliates	147,602	153,606
MNE groups operating in the UK	8,477	8,720
Profits before taxes UK affiliates	499	505
Counterfactual Profits	458	464
Profit Shifting (Difference)	41	41

Comparing the number of UK affiliates, as well as the number of worldwide affiliates and MNE groups operating in the UK, between columns 1 and 2 immediately reveals that there are not many associate firms (compared to subsidiary firms) and that they do not change much the overall number of MNE groups operating in the UK (who goes from 8,477 to 8,720). In terms of measures like overall revenue, operating profits and profits before taxes, the additional contribution of associate firms is also very modest. Finally, as far as the profit shifting exercise is concerned, the bottom-line figure of the UK gained in 2017 by £41 billion, the positive difference between actual and counterfactual profits is unchanged (See Figure 2 below). Table

A2 in the Appendix further provides a country breakdown of actual and counterfactual profits (Table A1 contains the list of countries and corresponding codes), as well as their difference, for the countries in which the MNE groups in our analysis operate. Again, we find very similar results with respect to our previous report. In particular, the UK benefits most in 2017 followed by the Netherlands, with £39.5 billion, Luxembourg, France, China and Norway. Conversely, the least benefitting country from profit shifting in 2017 was Singapore, with a £25.1 billion loss, followed closely by Belgium, Italy, Australia, Denmark and Spain.

Figure 2: Profits Shifting Exercise Results for the UK in 2017.

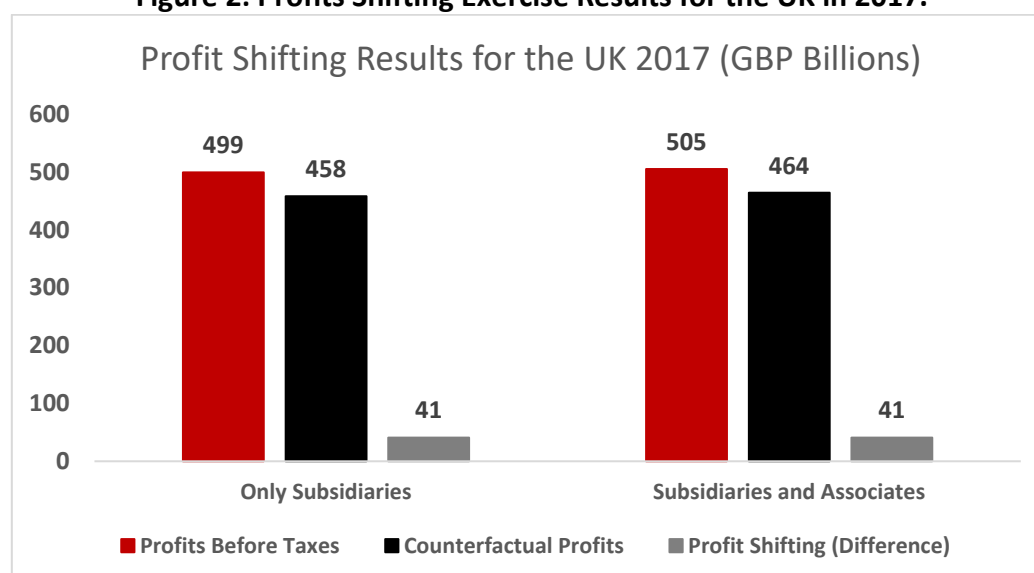


Table 2 below provides the same information as Table 1 for the year 2007 and results are somewhat different in terms of the quantitative importance of associate firms but not for the bottom-line profit shifting exercise. More specifically, comparing the number of UK affiliates, as well as the number of worldwide affiliates and MNE groups operating in the UK, between columns 1 and 2 confirms the year 2017 finding that there are not many associate firms (compared to subsidiary firms) and that they do not change much the overall number of MNE groups operating in the UK (who goes from 8,105 to 8,393). However, associates firms back in 2007 were very much sizeable in terms of measures like overall revenue, operating profits and profits before taxes both in the UK and worldwide. Nevertheless, the key finding that in 2007 the UK did not benefit having a negative difference between actual and counterfactual profits remaining unchanged while the extent of the negative difference goes from £24 billion to £32 billion when adding associate firms to the analysis (see Figure 3 below). Overall, this suggests that, while quantitatively sizeable in terms of overall sales and profits of the MNE groups they belong to, associate firms of MNE groups operating in the UK do not systematically contribute to a disconnect between sales and profits within the group and so ultimately have little impact on our profit shifting exercise. Table A3 in the Appendix further provides a country breakdown of actual and counterfactual profits, as well as their difference, for the countries in which the MNE groups in our analysis operate.

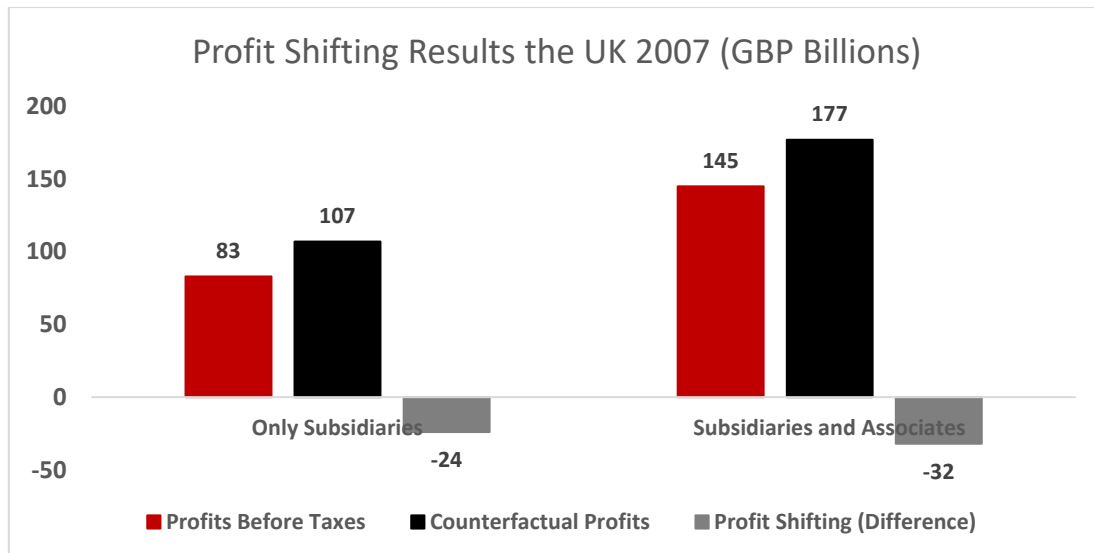
For completeness, we also report in Table A4 and A5 in the Appendix a country breakdown of results for 2017 and 2007 obtained imposing a further restriction to the data as we did in our previous report. The above results comprise all unconsolidated accounts regardless of

whether the parent company files a consolidated account or not. In other words, that sample also includes the unconsolidated accounts of the parent companies whenever available. Results in Tables A3 and A4 in the Appendix refer to the most common case in which the parent company files a consolidated account and so we consider the unconsolidated accounts of the affiliates present in the data. As can be appreciated, the result that the UK was a net winner (loser) in terms of our counterfactual profit shifting exercise in 2017 (2007) is unaffected.

Table 2: Summary stats and profit shifting figures referring to the year 2007 for MNE groups in the previous report (considering only subsidiaries) and the current report (considering subsidiaries and associates). Values reported in £ billion

	Considering only Subsidiaries	Considering Subsidiaries and Associates
Sales UK affiliates	2,146	3,364
Operating profits UK affiliates	-356	-553
Profits before taxes UK affiliates	83	145
Number of UK affiliates	35,110	36,607
Sales World affiliates	6,943	11,130
Operating profits World affiliates	-64	-79
Profits before taxes World affiliates	560	908
Number of World affiliates	119,910	128,847
MNE groups operating in the UK	8,105	8,393
Profits before taxes UK affiliates	83	145
Counterfactual Profits	107	177
Profit Shifting (Difference)	-24	-32

Figure 3: Profits Shifting Exercise Results for the UK in 2007.



5. Conclusions

In our analysis we extend the results in Mion and Tong (2021) and provide some figures about the importance of associate relationships for MNE groups operating in the UK, as well as complementary profit shifting results obtained using the wider sample of subsidiaries and associates firms. We do so for the years 2017 and 2007. Overall, this suggests that, while potentially sizeable in terms of overall sales and profits of the MNE groups they belong to, associate firms of MNE groups operating in the UK do not systematically contribute to a disconnect between sales and profits within the group and so ultimately have little impact on our profit shifting exercise. At the same time, data suggests that the quantitative importance of associate firms, in terms of overall sales and profits of the MNE groups they belong to, is declining over time and it is actually quite small as of 2017.

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APPENDIX

Table A1: List of countries covered in the analysis

Country_code	Country_name
AE	United Arab Emirates
AF	Afghanistan
AG	Antigua and Barbuda
AI	Anguilla
AL	Albania
AM	Armenia
AO	Angola
AR	Argentina
AT	Austria
AU	Australia
AW	Aruba
AZ	Azerbaijan
BA	Bosnia and Herzegovina
BB	Barbados
BD	Bangladesh
BE	Belgium
BF	Burkina Faso
BG	Bulgaria
BH	Bahrain
BI	Burundi
BJ	Benin
BM	Bermuda
BN	Brunei Darussalam
BO	Bolivia, Plurinational State of
BR	Brazil
BS	Bahamas
BT	Bhutan
BV	Bouvet Island
BW	Botswana
BY	Belarus
BZ	Belize
CA	Canada
CD	Congo, the Democratic Republic of the
CF	Central African Republic
CG	Congo
CH	Switzerland
CI	Côte d'Ivoire
CL	Chile
CM	Cameroon
CN	China
CO	Colombia
CR	Costa Rica

CU	Cuba
CV	Cape Verde
CW	Curaçao
CY	Cyprus
CZ	Czech Republic
DE	Germany
DJ	Djibouti
DK	Denmark
DM	Dominica
DO	Dominican Republic
DZ	Algeria
EC	Ecuador
EE	Estonia
EG	Egypt
ER	Eritrea
ES	Spain
ET	Ethiopia
FI	Finland
FJ	Fiji
FR	France
GA	Gabon
GB	United Kingdom
GD	Grenada
GE	Georgia
GH	Ghana
GI	Gibraltar
GM	Gambia
GN	Guinea
GQ	Equatorial Guinea
GR	Greece
GT	Guatemala
GW	Guinea-Bissau
GY	Guyana
HK	Hong Kong
HN	Honduras
HR	Croatia
HU	Hungary
ID	Indonesia
IE	Ireland
II	International Institutions
IL	Israel
IN	India
IQ	Iraq
IR	Iran, Islamic Republic of
IS	Iceland
IT	Italy

JM	Jamaica
JO	Jordan
JP	Japan
KE	Kenya
KG	Kyrgyzstan
KH	Cambodia
KM	Comoros
KN	Saint Kitts and Nevis
KR	Korea, Republic of
KV	Kosovo
KW	Kuwait
KY	Cayman Islands
KZ	Kazakhstan
LA	Lao People's Democratic Republic
LB	Lebanon
LC	Saint Lucia
LI	Liechtenstein
LK	Sri Lanka
LR	Liberia
LS	Lesotho
LT	Lithuania
LU	Luxembourg
LV	Latvia
LY	Libya
MA	Morocco
MC	Monaco
MD	Moldova, Republic of
ME	Montenegro
MG	Madagascar
MH	Marshall Islands
MK	Macedonia, the Former Yugoslav Republic of
ML	Mali
MM	Myanmar
MN	Mongolia
MR	Mauritania
MT	Malta
MU	Mauritius
MW	Malawi
MX	Mexico
MY	Malaysia
MZ	Mozambique
NA	Namibia
NG	Nigeria
NI	Nicaragua
NL	Netherlands
NO	Norway

NP	Nepal
NZ	New Zealand
OM	Oman
PA	Panama
PE	Peru
PG	Papua New Guinea
PH	Philippines
PK	Pakistan
PL	Poland
PS	Palestine, State of
PT	Portugal
PY	Paraguay
QA	Qatar
RO	Romania
RS	Serbia
RU	Russian Federation
RW	Rwanda
SA	Saudi Arabia
SC	Seychelles
SD	Sudan
SE	Sweden
SG	Singapore
SI	Slovenia
SK	Slovakia
SL	Sierra Leone
SN	Senegal
SO	Somalia
SS	South Sudan
ST	Sao Tome and Principe
SV	El Salvador
SY	Syrian Arab Republic
SZ	Swaziland
TD	Chad
TG	Togo
TH	Thailand
TM	Turkmenistan
TN	Tunisia
TR	Turkey
TT	Trinidad and Tobago
TW	Taiwan, Province of China
TZ	Tanzania, United Republic of
UA	Ukraine
UG	Uganda
US	United States
UY	Uruguay
UZ	Uzbekistan

VC	Saint Vincent and the Grenadines
VE	Venezuela, Bolivarian Republic of
VG	Virgin Islands, British
VN	Vietnam
WS	Samoa
YE	Yemen
ZA	South Africa
ZM	Zambia
ZW	Zimbabwe

Table A2: Actual and counterfactual profits in 2017: all unconsolidated accounts (values reported in billion GBP)

country	GUO50Cs based in the country	Actual profits	Counterfactual profits	Difference	Affiliates per country
AE	17	0.000	0.000	0.000	0
AI	4	0.000	0.000	0.000	0
AL	0	-0.017	0.012	-0.030	16
AO	1	0.000	0.000	0.000	0
AR	0	0.110	-0.065	0.174	20
AT	69	12.530	11.330	1.196	1473
AU	201	98.610	116.800	-18.190	2636
AW	1	0.000	0.000	0.000	0
AZ	1	0.000	0.000	0.000	0
BA	0	0.050	0.131	-0.081	115
BB	2	0.000	0.000	0.000	0
BE	108	21.680	42.100	-20.420	6168
BF	0	0.000	0.000	0.000	0
BG	4	1.474	2.052	-0.578	871
BH	4	0.000	0.000	0.000	0
BI	0	0.000	0.000	0.000	0
BJ	0	0.000	0.000	0.000	0
BM	106	0.000	0.000	0.000	0
BN	1	0.000	0.000	0.000	0
BR	20	7.585	7.339	0.246	731
BS	8	0.000	0.000	0.000	0
BW	0	0.000	0.000	0.000	0
BY	1	0.000	0.000	0.000	0
BZ	2	0.000	0.000	0.000	0
CA	140	0.000	0.000	0.000	0
CD	0	0.000	0.000	0.000	0
CF	0	0.000	0.000	0.000	0
CG	0	0.000	0.000	0.000	0
CH	230	0.176	0.078	0.098	25

CI	0	0.008	0.004	0.003	1
CL	7	0.536	0.390	0.146	24
CN	96	198.000	182.000	16.050	2529
CO	1	3.432	8.154	-4.722	1017
CU	0	0.000	0.000	0.000	0
CW	21	0.000	0.000	0.000	0
CY	63	-0.591	-0.661	0.070	12
CZ	5	10.750	12.730	-1.983	2427
DE	525	25.850	27.360	-1.516	2173
DJ	0	0.000	0.000	0.000	0
DK	184	14.930	30.750	-15.820	4686
DM	1	0.000	0.000	0.000	0
DZ	1	0.000	0.000	0.000	0
EE	3	0.379	0.951	-0.573	540
EG	4	1.077	1.025	0.052	2
ER	0	0.000	0.000	0.000	0
ES	130	21.380	33.800	-12.430	6306
ET	0	0.000	0.000	0.000	0
FI	70	9.924	13.230	-3.309	1867
FR	401	118.600	102.200	16.450	20185
GA	0	0.256	0.117	0.139	1
GB	1694	504.700	463.800	40.860	40187
GI	4	0.000	0.000	0.000	0
GM	0	0.000	0.000	0.000	0
GN	0	0.000	0.000	0.000	0
GQ	0	0.000	0.000	0.000	0
GR	19	0.762	0.939	-0.177	243
HK	40	0.000	0.000	0.000	0
HR	1	0.554	0.814	-0.259	737
HU	5	5.300	8.015	-2.715	1527
ID	5	0.000	0.000	0.000	0
IE	217	60.790	56.690	4.103	4267
II	1	0.000	0.000	0.000	0
IL	58	0.000	0.000	0.000	0
IN	188	5.203	6.104	-0.901	2259
IQ	0	0.000	0.000	0.000	0
IR	5	1.753	1.752	0.000	4
IS	13	0.411	0.665	-0.253	185
IT	282	30.380	48.830	-18.450	11401
JM	2	0.000	0.000	0.000	0
JO	1	0.000	0.000	0.000	0
JP	446	48.800	46.560	2.234	3023
KE	1	0.000	0.000	0.000	0
KM	0	0.000	0.000	0.000	0
KN	3	0.000	0.000	0.000	0
KR	51	6.249	9.434	-3.185	1184

KV	0	0.001	0.001	0.000	2
KW	11	0.000	0.000	0.000	0
KY	99	0.010	0.038	-0.028	1
KZ	1	3.363	2.736	0.627	113
LB	5	0.000	0.000	0.000	0
LI	11	0.000	0.000	0.000	0
LK	2	-0.026	-0.019	-0.008	7
LR	1	0.000	0.000	0.000	0
LS	0	0.000	0.000	0.000	0
LT	5	0.357	0.412	-0.055	192
LU	265	21.240	3.157	18.080	713
LV	6	0.129	0.323	-0.194	618
LY	3	0.000	0.000	0.000	0
MA	2	0.036	-0.013	0.049	2
MC	1	0.000	0.000	0.000	0
MD	0	0.001	0.000	0.000	2
ME	0	0.032	0.061	-0.029	52
MG	0	0.000	0.000	0.000	0
MH	10	0.000	0.000	0.000	0
MK	0	0.139	0.219	-0.080	88
ML	0	0.000	0.000	0.000	0
MR	0	0.000	0.000	0.000	0
MT	29	1.904	0.926	0.978	336
MU	17	0.021	0.030	-0.009	51
MW	0	0.021	-0.045	0.066	1
MX	10	3.223	3.131	0.091	93
MY	49	0.000	0.002	-0.002	2
NA	0	0.000	0.000	0.000	0
NG	2	0.000	0.000	0.000	0
NL	283	91.150	51.650	39.500	1782
NO	123	44.270	31.480	12.790	5151
NZ	34	1.465	1.869	-0.405	393
OM	1	0.000	0.000	0.000	0
PA	15	0.000	0.000	0.000	0
PE	0	0.047	-0.004	0.051	2
PH	9	0.000	0.000	0.000	0
PK	5	0.128	0.169	-0.041	5
PL	18	7.513	13.340	-5.825	2871
PT	28	4.959	7.255	-2.296	2969
PY	0	0.000	0.000	0.000	0
QA	8	0.000	0.000	0.000	0
RO	0	3.265	6.572	-3.307	2238
RS	1	0.715	1.002	-0.287	631
RU	15	31.600	35.340	-3.739	5152
RW	0	0.000	0.000	0.000	0
SA	4	0.000	0.000	0.000	0

SC	1	0.000	0.000	0.000	0
SD	0	0.000	0.000	0.000	0
SE	239	33.540	36.930	-3.384	7514
SG	65	44.900	70.030	-25.140	752
SI	2	0.662	1.031	-0.369	479
SK	3	2.669	4.111	-1.442	1579
SL	0	0.000	0.000	0.000	0
SS	0	0.000	0.000	0.000	0
ST	0	0.000	0.000	0.000	0
SZ	0	0.000	0.000	0.000	0
TD	0	0.000	0.000	0.000	0
TG	0	0.000	0.000	0.000	0
TH	18	0.009	0.023	-0.014	13
TN	0	-0.002	0.001	-0.002	1
TR	13	3.977	4.712	-0.735	248
TT	2	0.000	0.000	0.000	0
TW	48	1.703	2.530	-0.827	46
TZ	0	0.000	0.000	0.000	0
UA	0	1.147	1.566	-0.419	620
US	1511	2.192	2.187	0.005	1
UY	0	0.334	0.195	0.139	43
VC	2	0.000	0.000	0.000	0
VG	88	0.000	0.000	0.000	0
VU	1	0.000	0.000	0.000	0
WW	1	0.000	0.000	0.000	0
YE	0	0.000	0.000	0.000	0
YY	134	0.000	0.000	0.000	0
ZA	51	0.000	0.000	0.000	0
ZM	0	0.000	0.000	0.000	0
ZW	0	0.000	-0.021	0.021	1
Total	8720	1518.324	1518.358	-0.010	153606

Table A3: Actual and counterfactual profits in 2007: all unconsolidated accounts (values reported in billion GBP)

country	GUO50Cs based in the country	Actual profits	Counterfactual profits	Difference	Affiliates per country
AE	9	0.000	0.000	0.000	0
AI	1	0.000	0.000	0.000	0
AL	0	0.000	0.000	0.000	0
AR	0	0.599	0.714	-0.115	30
AT	75	15.720	13.900	1.819	1867
AU	164	23.060	22.950	0.110	75
BA	1	0.127	0.036	0.091	53
BB	2	0.044	0.026	0.018	1

BE	192	43.460	42.510	0.958	5268
BG	3	0.945	1.501	-0.556	397
BH	2	0.000	0.000	0.000	0
BM	73	0.000	0.000	0.000	0
BO	0	0.147	0.082	0.064	6
BR	7	5.156	6.181	-1.025	136
BS	10	0.000	0.000	0.000	0
BY	0	0.000	0.000	0.000	0
BZ	2	0.000	0.000	0.000	0
CA	154	0.000	0.000	0.000	0
CH	255	0.049	0.096	-0.046	13
CL	3	0.157	0.270	-0.114	28
CN	22	19.030	15.460	3.570	1750
CO	0	2.625	3.910	-1.284	350
CW	30	0.000	0.000	0.000	0
CY	41	7.429	4.919	2.510	13
CZ	7	6.316	7.281	-0.965	1442
DE	612	79.050	88.940	-9.892	8644
DK	231	22.930	20.420	2.504	3439
DM	1	0.000	0.000	0.000	0
DZ	0	0.042	0.141	-0.099	26
EC	0	0.106	0.166	-0.061	4
EE	1	0.612	0.609	0.003	370
EG	4	0.000	0.000	0.000	0
ES	125	50.300	43.360	6.938	7889
FI	78	4.135	6.225	-2.091	1684
FR	509	134.200	129.000	5.197	21673
GB	1371	144.900	176.900	-31.910	36607
GI	13	0.000	0.000	0.000	0
GR	27	2.646	4.025	-1.379	1007
GT	0	0.050	0.047	0.003	1
GY	0	0.007	0.020	-0.013	1
HK	16	0.000	0.000	0.000	0
HR	3	0.759	1.044	-0.285	456
HU	3	5.217	5.242	-0.025	917
ID	4	0.000	0.000	0.000	0
IE	216	20.700	23.760	-3.059	3044
IL	59	0.000	0.000	0.000	0
IN	101	1.325	1.559	-0.235	218
IR	1	0.000	0.000	0.000	0
IS	29	0.070	-0.122	0.192	230
IT	335	26.410	51.440	-25.030	7404
JM	4	0.002	-0.017	0.019	1
JO	1	0.000	0.000	0.000	0
JP	415	30.960	30.460	0.496	840
KN	3	0.000	0.000	0.000	0

KR	41	3.868	7.748	-3.880	835
KW	7	0.000	0.000	0.000	0
KY	42	0.000	0.000	0.000	0
KZ	1	4.211	1.182	3.029	3
LB	1	0.000	0.000	0.000	0
LC	0	0.008	0.004	0.004	1
LI	12	0.000	0.000	0.000	0
LK	3	0.000	0.000	0.000	0
LR	2	0.000	0.000	0.000	0
LT	1	0.495	0.637	-0.142	159
LU	175	8.646	6.437	2.209	487
LV	1	0.270	0.285	-0.014	222
LY	1	0.000	0.000	0.000	0
MC	1	0.000	0.000	0.000	0
MD	0	0.155	0.083	0.072	9
ME	0	0.045	0.028	0.018	3
MK	0	0.153	0.069	0.085	16
MT	12	0.966	-0.111	1.078	56
MU	5	0.000	0.000	0.000	0
MX	3	-9.457	-1.108	-8.349	67
MY	34	0.002	0.010	-0.008	23
NL	371	105.900	54.600	51.300	3418
NO	153	34.570	19.310	15.260	2927
NZ	25	0.413	0.455	-0.041	86
OM	3	0.000	0.000	0.000	0
PA	9	0.116	0.219	-0.103	4
PE	0	0.384	0.259	0.125	23
PH	4	1.969	2.527	-0.558	182
PK	1	0.000	0.000	0.000	0
PL	83	7.994	12.720	-4.721	2745
PT	23	5.342	3.813	1.529	1898
QA	1	0.000	0.000	0.000	0
RO	0	2.838	2.881	-0.043	1176
RS	0	0.407	0.689	-0.282	206
RU	18	23.850	22.560	1.299	2105
SA	8	0.000	0.000	0.000	0
SC	1	0.000	0.000	0.000	0
SE	307	33.060	24.120	8.940	4765
SG	49	23.900	33.250	-9.352	498
SI	5	0.506	0.616	-0.110	146
SK	3	2.306	2.460	-0.154	428
TH	9	0.000	0.000	0.000	0
TR	14	4.040	5.972	-1.932	125
TT	1	0.032	0.099	-0.067	2
TW	43	-0.159	0.763	-0.923	34
UA	0	1.720	1.711	0.009	305

US	1603	-0.009	-0.007	-0.002	3
UY	0	0.203	0.787	-0.584	5
VE	0	0.000	0.000	0.000	1
VG	38	0.000	0.000	0.000	0
YY	21	0.000	0.000	0.000	0
ZA	40	0.000	0.000	0.000	0
ZW	1	0.000	0.000	0.000	0
ZZ	2	0.000	0.000	0.000	0
Total	8393	908.030	908.123	-0.002	128847

Table A4: Actual and counterfactual profits in 2017: unconsolidated accounts with a parent company filing a consolidated account (values reported in billion GBP)

country	GUO50Cs based in the country	Actual profits	Counterfactual profits	Difference	Affiliates per country
AE	5	0.000	0.000	0.000	0
AI	1	0.000	0.000	0.000	0
AL	0	-0.024	0.016	-0.041	14
AR	0	0.089	-0.031	0.120	10
AT	33	9.834	9.429	0.405	938
AU	131	28.960	38.620	-9.661	1730
BA	0	0.024	0.139	-0.115	85
BB	1	0.000	0.000	0.000	0
BE	62	15.530	37.680	-22.150	4179
BF	0	0.000	0.000	0.000	0
BG	2	0.917	2.004	-1.086	599
BH	1	0.000	0.000	0.000	0
BI	0	0.000	0.000	0.000	0
BJ	0	0.000	0.000	0.000	0
BM	62	0.000	0.000	0.000	0
BR	12	5.495	5.721	-0.226	509
BW	0	0.000	0.000	0.000	0
CA	89	0.000	0.000	0.000	0
CD	0	0.000	0.000	0.000	0
CF	0	0.000	0.000	0.000	0
CG	0	0.000	0.000	0.000	0
CH	84	0.171	0.099	0.072	24
CI	0	0.008	0.004	0.003	1
CL	6	0.536	0.467	0.069	24
CN	49	74.860	69.150	5.708	1928
CO	1	3.011	6.570	-3.560	809
CU	0	0.000	0.000	0.000	0
CW	2	0.000	0.000	0.000	0
CY	3	-0.007	0.002	-0.010	5
CZ	0	7.126	9.981	-2.855	1474

DE	194	19.400	23.050	-3.647	1621
DJ	0	0.000	0.000	0.000	0
DK	116	10.900	21.210	-10.310	3198
EE	0	0.311	0.483	-0.173	368
EG	2	0.000	0.000	0.000	0
ER	0	0.000	0.000	0.000	0
ES	62	14.400	26.270	-11.870	4347
ET	0	0.000	0.000	0.000	0
FI	49	9.233	12.590	-3.355	1369
FR	210	92.280	85.120	7.158	13398
GA	0	0.256	0.117	0.139	1
GB	1181	416.500	348.100	68.440	27679
GI	2	0.000	0.000	0.000	0
GM	0	0.000	0.000	0.000	0
GN	0	0.000	0.000	0.000	0
GQ	0	0.000	0.000	0.000	0
GR	18	0.726	0.792	-0.066	205
HK	14	0.000	0.000	0.000	0
HR	0	0.385	0.746	-0.361	489
HU	2	5.452	7.505	-2.054	1117
ID	2	0.000	0.000	0.000	0
IE	126	54.240	47.050	7.189	2336
IL	39	0.000	0.000	0.000	0
IN	143	2.909	6.309	-3.400	1718
IQ	0	0.000	0.000	0.000	0
IS	5	0.119	0.497	-0.379	112
IT	155	18.580	39.380	-20.790	5426
JM	2	0.000	0.000	0.000	0
JO	1	0.000	0.000	0.000	0
JP	377	28.480	32.020	-3.543	2850
KE	1	0.000	0.000	0.000	0
KM	0	0.000	0.000	0.000	0
KR	49	6.115	8.494	-2.379	991
KV	0	0.001	0.001	0.000	2
KW	6	0.000	0.000	0.000	0
KY	32	0.010	-0.062	0.071	1
KZ	1	1.764	1.441	0.323	94
LB	1	0.000	0.000	0.000	0
LI	1	0.000	0.000	0.000	0
LK	1	0.003	0.003	-0.001	6
LR	1	0.000	0.000	0.000	0
LS	0	0.000	0.000	0.000	0
LT	2	0.277	0.307	-0.031	128
LU	27	11.590	0.933	10.660	337
LV	1	0.155	0.298	-0.143	339
LY	0	0.000	0.000	0.000	0

MA	0	0.036	-0.034	0.070	2
MC	0	0.000	0.000	0.000	0
MD	0	0.000	0.000	0.000	0
ME	0	0.027	0.059	-0.032	37
MG	0	0.000	0.000	0.000	0
MH	6	0.000	0.000	0.000	0
MK	0	0.135	0.245	-0.110	71
ML	0	0.000	0.000	0.000	0
MR	0	0.000	0.000	0.000	0
MT	2	1.402	0.712	0.690	136
MU	4	0.021	0.027	-0.006	39
MW	0	0.000	0.000	0.000	0
MX	8	1.526	0.614	0.912	66
MY	36	0.000	0.000	0.000	1
NA	0	0.000	0.000	0.000	0
NG	1	0.000	0.000	0.000	0
NL	167	78.890	42.860	36.030	1270
NO	82	36.690	27.510	9.176	3730
NZ	27	0.798	1.387	-0.589	300
OM	0	0.000	0.000	0.000	0
PA	2	0.000	0.000	0.000	0
PE	0	0.011	0.007	0.004	1
PH	5	0.000	0.000	0.000	0
PK	4	0.127	0.218	-0.092	2
PL	10	6.168	12.390	-6.221	1991
PT	11	3.543	5.252	-1.708	1921
PY	0	0.000	0.000	0.000	0
QA	1	0.000	0.000	0.000	0
RO	0	2.584	6.630	-4.046	1475
RS	0	0.603	0.986	-0.383	412
RU	5	21.360	24.640	-3.271	3004
RW	0	0.000	0.000	0.000	0
SA	3	0.000	0.000	0.000	0
SC	0	0.000	0.000	0.000	0
SD	0	0.000	0.000	0.000	0
SE	196	27.560	27.760	-0.199	5451
SG	35	37.080	62.400	-25.320	549
SI	2	0.548	0.897	-0.349	334
SK	0	2.159	3.536	-1.377	983
SL	0	0.000	0.000	0.000	0
SS	0	0.000	0.000	0.000	0
ST	0	0.000	0.000	0.000	0
SZ	0	0.000	0.000	0.000	0
TD	0	0.000	0.000	0.000	0
TG	0	0.000	0.000	0.000	0
TH	18	0.008	0.009	-0.001	12

TN	0	-0.002	0.001	-0.002	1
TR	6	1.201	1.791	-0.589	144
TT	1	0.000	0.000	0.000	0
TW	43	0.769	1.048	-0.279	25
TZ	0	0.000	0.000	0.000	0
UA	0	0.681	1.114	-0.433	374
US	962	0.000	0.000	0.000	0
UY	0	0.176	0.219	-0.044	31
VG	13	0.000	0.000	0.000	0
YE	0	0.000	0.000	0.000	0
ZA	40	0.000	0.000	0.000	0
ZM	0	0.000	0.000	0.000	0
ZW	0	0.000	-0.023	0.023	1
Total	5057	1064.712	1064.762	0.007	102824

Table A5: Actual and counterfactual profits in 2007: unconsolidated accounts with a parent company filing a consolidated account (values reported in billion GBP)

country	GUO50Cs based in the country	Actual profits	Counterfactual profits	Difference	Affiliates per country
AE	3	0.000	0.000	0.000	0
AI	1	0.000	0.000	0.000	0
AL	0	0.000	0.000	0.000	0
AR	0	0.591	0.699	-0.108	26
AT	25	11.080	10.180	0.892	1125
AU	142	3.543	1.590	1.953	31
BA	0	-0.002	0.028	-0.030	31
BB	1	0.044	0.025	0.019	1
BE	92	31.340	36.260	-4.922	3520
BG	0	0.704	1.343	-0.639	240
BM	33	0.000	0.000	0.000	0
BO	0	0.147	0.082	0.064	6
BR	6	4.922	6.021	-1.099	115
BS	1	0.000	0.000	0.000	0
BY	0	0.000	0.000	0.000	0
CA	108	0.000	0.000	0.000	0
CH	85	0.027	0.065	-0.038	10
CL	2	0.112	0.247	-0.135	20
CN	4	16.480	13.210	3.274	1455
CO	0	2.293	3.730	-1.436	286
CW	3	0.000	0.000	0.000	0
CY	9	0.034	0.016	0.017	7
CZ	1	5.312	5.805	-0.493	1040
DE	338	56.400	68.650	-12.250	5862
DK	141	14.980	12.950	2.025	2407

DZ	0	0.041	0.144	-0.103	22
EC	0	0.106	0.164	-0.058	4
EE	0	0.392	0.453	-0.060	291
EG	3	0.000	0.000	0.000	0
ES	68	42.640	35.350	7.283	5674
FI	68	3.775	5.333	-1.558	1424
FR	232	104.500	104.200	0.291	14777
GB	926	75.550	93.630	-18.080	25394
GI	2	0.000	0.000	0.000	0
GR	20	2.252	3.339	-1.087	785
GT	0	0.050	0.047	0.003	1
GY	0	0.007	0.019	-0.013	1
HK	9	0.000	0.000	0.000	0
HR	2	0.533	0.607	-0.074	279
HU	2	4.711	4.668	0.043	674
ID	3	0.000	0.000	0.000	0
IE	135	14.610	14.760	-0.156	1734
IL	44	0.000	0.000	0.000	0
IN	77	0.721	0.958	-0.237	132
IS	16	0.003	-0.150	0.153	167
IT	202	22.500	43.520	-21.020	5179
JM	4	0.002	-0.017	0.019	1
JP	331	8.935	8.806	0.129	729
KR	33	3.993	6.475	-2.482	701
KW	3	0.000	0.000	0.000	0
KY	12	0.000	0.000	0.000	0
KZ	0	4.211	1.181	3.030	3
LI	0	0.000	0.000	0.000	0
LK	3	0.000	0.000	0.000	0
LR	1	0.000	0.000	0.000	0
LT	0	0.210	0.333	-0.123	117
LU	10	4.315	3.925	0.390	271
LV	1	0.153	0.162	-0.008	166
MD	0	0.151	0.096	0.055	6
ME	0	0.045	0.028	0.018	3
MK	0	0.139	0.059	0.080	13
MT	2	0.307	-0.118	0.426	39
MU	1	0.000	0.000	0.000	0
MX	3	-3.239	-1.330	-1.908	49
MY	30	0.002	0.005	-0.003	20
NL	250	86.900	45.320	41.580	2250
NO	93	30.310	17.510	12.800	2330
NZ	19	0.170	0.347	-0.178	66
OM	1	0.000	0.000	0.000	0
PA	2	0.116	0.220	-0.104	4
PE	0	0.352	0.250	0.102	16

PH	0	1.739	2.052	-0.313	134
PL	13	6.537	10.310	-3.770	1912
PT	8	4.286	2.939	1.347	1282
QA	1	0.000	0.000	0.000	0
RO	0	2.523	2.602	-0.078	759
RS	0	0.343	0.644	-0.301	158
RU	8	18.400	17.280	1.121	1453
SA	2	0.000	0.000	0.000	0
SE	238	29.060	20.850	8.207	4083
SG	39	20.540	30.280	-9.748	413
SI	2	0.423	0.536	-0.113	113
SK	0	2.088	2.311	-0.223	304
TH	9	0.000	0.000	0.000	0
TR	6	1.603	3.135	-1.531	68
TT	0	0.032	0.097	-0.065	2
TW	42	-0.254	0.684	-0.938	22
UA	0	1.534	1.366	0.167	159
US	1104	0.011	0.011	0.001	1
UY	0	0.009	0.013	-0.004	4
VG	4	0.000	0.000	0.000	0
ZA	29	0.000	0.000	0.000	0
ZW	1	0.000	0.000	0.000	0
Total	5109	646.344	646.305	0.002	90371