

Toward a new tax reality: An empirical examination of formulary apportionment using public country-by-country reporting

Dr Rodney Brown (UNSW)

Professor Bjorn Jorgensen (CBS)

Professor Kerrie Sadiq (QUT)



Background

- Current international tax framework
 - Profits of multinational enterprises (MNEs) are allocated to jurisdictions using separate accounting methodology
 - Each subsidiary/branch of an MNE is treated as a separate unrelated entity and files a tax return
 - Arm's length prices are then used to determine the value of intra-group transactions based on the market value of comparable supplies between unconnected entities
 - This system, designed in the early 20th century, is out of step with modern business practice (digital economy)
 - Loopholes in tax laws are exploited by well-resourced MNEs motivated to optimise after-tax returns

Background

- Proposal for a better alignment between the allocation of taxable profits and underlying real economic activity
 - Guided by the belief that MNEs should be treated in accordance with the reality they operate as single firms (commonly owned and controlled)
 - All legal entities within an MNE are treated as one unitary enterprise and their global operations consolidated (unitary taxation) and aggregated profits are then allocated to jurisdictions according to a predetermined formula based on underlying economic factors associated with the derivation of those profits (formulary apportionment)
 - Variations of formulary apportionment have been incorporated in recent reform proposals (e.g., European Commission *Common Consolidated Corporate Tax Base* and now *Business in Europe: Framework for Income Taxation (BEFIT)* and OECD Inclusive Framework's Two Pillar solution for taxing large MNEs, and are already used in some countries (e.g., U.S.A., Canada, Switzerland))

Background

- Despite theoretical attractiveness of formulary apportionment, assessing its impact or effectiveness is challenging due to the relative non-accessibility and limitations of country-level data on profits and apportionment factors
- Recent progress includes the availability of new data and adoption of innovative methodologies by researchers
- New data includes:
 - Country-by-country reports (CbCR) for EU banks (in accordance with CRD IV since 2013)
 - CbCR data for MNEs in accordance with OECD BEPS Action 13 (public release of aggregated data by the OECD and IRS) and/or other transparency initiatives e.g., Global Reporting Initiative (GRI)
- Innovative methodologies include aggregating individual unconsolidated financial statement data in Orbis to construct consolidated groups and reverse engineer CbCR

This study

- Creates two unique samples using two different sources of CbCR data exploiting the fact:
 - Some EU banks voluntarily disclose additional information in their CbCR (i.e., total assets) over and above mandated items (turnover, profit before tax, income tax, employee numbers)
 - Some MNEs voluntarily disclose their OECD CbCR that otherwise need only be submitted to tax authorities or their CbCR prepared in line with GRI 207
- Exploits these hand collected data sets to evaluate the impact of adopting global formulary apportionment
 - Assess formulary apportionment factors – revenue/turnover, total assets/tangible assets, employee numbers/employee costs
 - Estimate the misalignment (if any) between observed profits recognised in countries and the ‘counterfactual profit’ had this been determined by a formula based on economic factors (differences likely due to profit shifting)

Example CbCR - EU banks CRD IV

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			31 December 2020				
	Principal subsidiary	Main activity	Total assets	Total operating income (in millions)	Average number of FTEs	Operating profit/(loss) before taxation (in millions)	Income tax expense (in millions)
Netherlands	ABN AMRO Bank N.V.	Retail Banking	355,587	6,405	15,430	1,052	271
France	Banque Neufilize OBC S.A.	Private Banking	4,982	523	806	305	102
Germany	Bethmann Bank AG	Private Banking	3,529	226	677	40	10
Belgium	ABN AMRO Bank N.V. Branch Belgium	Private Banking	1,348	90	379	-49	
United Kingdom	ABN AMRO Asset based Finance N.V., UK branche	Commercial Banking	2,076	61	316	-8	
Norway	ABN AMRO Bank N.V. Oslo Branch	Corporate & Institutional Banking	2,018	46	20	-175	-7
Denmark	ABN AMRO Securities Holdings (Denmark) ApS	Corporate & Institutional Banking	-119				
United States	ABN AMRO Clearing Chicago LLC	Corporate & Institutional Banking	18,968	331	440	-344	-7
Brazil	Banco ABN AMRO S.A.	Corporate & Institutional Banking	374	13	76	-3	7
Singapore	ABN AMRO Bank N.V. Branch Singapore	Corporate & Institutional Banking	5,025	108	268	-327	3
Hong Kong	ABN AMRO Bank N.V. Branch Hong Kong	Private Banking	1,159	72	111	-101	15
Japan	ABN AMRO Clearing Tokyo Co. Ltd.	Corporate & Institutional Banking	229	18	18	9	3
United Arab Emirates	ABN AMRO Bank N.V. Branch UAE/DIFC	Private Banking			3		
Australia	ABN AMRO Clearing Sydney Pty Ltd.	Corporate & Institutional Banking	523	17	65		1
Other			-75	5	32	-42	3
Total			395,623	7,916	18,642	356	401

Example CbCR – OECD / GRI 207

Our OECD BEPS country-by-country report, 2017

Tax jurisdiction	Revenue			Profit (loss) before income tax (€)	Income tax paid (on cash basis) (€)	Income tax accrued – Current year (€)	Stated capital (€)	Accumulated earnings (€)	Number of employees	Tangible assets other than cash and cash equivalents (€)
	Unrelated party (€)	Related party (€)	Total (€)							
Albania	119,328,603	1,577,271	120,905,874	2,810,348	(2,211,696)	(2,037,169)	43,360,352	116,892,035	441	101,888,428
Angola	3,815,005	-	3,815,005	713,781	-	(75,899)	-	231,505	9	274,671
Argentina	-	190,184	190,184	(27,945)	-	(14,313)	29	(0)	-	-
Australia	8,469,118	4,785,273	13,254,391	(847,791)	(366,642)	(296,808)	516,199,607	(477,777,981)	17	1,346,575
Austria	100,531	1,820,948	1,921,479	214,111	-	3,375	13,431,765	(14,640,160)	-	1,300,398
Bahrain	80,527	142,807	223,334	29,634	-	-	32,555	(61,175)	-	-
Belgium	756,978	10,110,731	10,867,709	1,933,915	(3,970)	(1,035)	14,206,534	(5,656,278)	17	2,017,983
Brazil	11,990,808	1,229,375	13,220,183	(3,213,637)	-	335,829	1,646,405	(20,253,693)	4	99,106
Bulgaria	-	-	-	-	-	-	-	-	-	-
Cameroon	6,960,189	-	6,960,189	1,133,589	(249,538)	(335,014)	321,215	1,563,068	27	1,352,748
Canada	-	650,000	650,000	67,137	20,000	67,137	8,129,777	(4,921,600)	4	190,587
Cayman Islands	-	-	-	32,968,843	-	-	13,058,165,544	(311,235,071)	-	-
Chile	-	-	-	-	-	-	8,670	-	1	-
China	5,726,783	4,102,183	9,828,966	(32,286)	(48,198)	-	16,511,553	(6,082,703)	23	2,210,274
Côte d'Ivoire	2,709,343	-	2,709,343	856,517	(37,107)	-	-	350,122	7	186,455
Czech Republic	514,157,234	2,335,690	516,492,924	31,623,010	(2,856,392)	(7,171,265)	53,603,523	572,233,923	1,694	306,431,343
Denmark	-	1,738,815	1,738,815	411,838	(3,587)	-	16,460,361	(16,564,677)	-	112,926
Democratic Republic of Congo	371,486,456	-	371,486,456	(46,514,253)	(4,004,528)	(4,033,103)	757,404	(480,692,320)	615	301,012,860
Egypt	1,369,027,330	78,351,160	1,447,378,491	267,986,867	(85,645,962)	(104,397,954)	90,946,980	530,067,160	8,381	594,031,271
Finland	-	-	-	-	-	-	-	-	-	-
France	20,879,739	38,260,417	59,140,156	369,424	(680,555)	(69,698)	5,259,125	17,798,682	42	28,948,628
Germany	10,705,998,144	627,753,286	11,333,751,429	(930,019,642)	(88,878,095)	(56,485,596)	4,506,069,899	(13,444,269,829)	15,714	8,182,170,523
Ghana	286,774,306	945,806	287,720,113	(241,922,609)	(626,541)	(69,611)	2,871,691	(1,172,346,878)	1,111	147,473,925
Greece	851,250,403	3,457,183	854,707,585	379,918	(1,622,461)	-	369,346,327	18,832,019	1,978	485,643,758
Guernsey	-	-	-	(43,423)	-	-	28,706,625	1,610,746	-	(0)
Hong Kong	59,551,973	2,236,830	61,788,803	(13,941,666)	-	-	135,541,407	(117,271,423)	84	6,653,667

Research design

- Two stages

- (1) Estimate the determinants of country-level pre-tax profits/(losses) of both samples to assess the extent to which pre-tax profits recognised in an individual country is explained by the three key apportionment factors (sales, employees, assets)

○ EU banks:
$$PBT_{ij,t} = \beta_0 + \beta_1 TURNOVER_{ij,t} + \beta_2 EMP_NUM_{ij,t} + \beta_3 ASSETS_TOTAL_{ij,t} + \varepsilon_{ij,t} \quad (1)$$

○ Voluntary disclosers:
$$PBT_{ij,t} = \beta_0 + \beta_1 REVENUE_TP_{ij,t} + \beta_2 EMP_NUM_{ij,t} + \beta_3 ASSETS_TANG_{ij,t} + \varepsilon_{ij,t} \quad (2)$$

- (2) Estimate the 'counterfactual profit' using the following multi-factor formula:

$$\hat{PBT}_{ij,t} = \frac{1}{3} * SALES_{ij,t} + \frac{1}{3} * EMP_NUM_{ij,t} + \frac{1}{3} * ASSETS_{ij,t} \quad (3)$$

Sample details

- Sample 1 - EU banks
 - Banks that operate in the EU, publish a CbCR in accordance with CRD IV requirements, and voluntarily disclose 'total assets' in addition to the mandated disclosure items (i.e., turnover, profit/(loss) before tax, income tax expense, employee numbers)
 - Extracted from the hand-collected database developed and maintained by one of the authors (currently 135 banks from 18 countries for 2013-2021)
- Sample 2 - Voluntary disclosers
 - Firms that voluntarily publish their CbCR prepared in accordance with BEPS Action 13 and/or GRI 207 and submitted to tax authorities
 - Identified from a variety of public sources e.g., members of the European Business Tax Forum and 'B Team'
 - Hand collected CbCRs

Sample details – Table 1

Panel A: EU banks

	Firm	Headquarter country	Years disclosed	Number of countries disclosed (mean)	Firm-country-year observations
1.	Bank 1	Netherlands	6 (2016-2021)	16	95
2.	Bank 2	Netherlands	2 (2018-2019)	22	41
3.	Bank 3	Belgium	7 (2015-2021)	3	21
4.	Bank 4	Portugal	8 (2014-2021)	4	34
5.	Bank 5	Norway	7 (2015-2021)	4	26
6.	Bank 6	Norway	5 (2017-2021)	9	45
7.	Bank 7	Sweden	8 (2014-2021)	4	31
8.	Bank 8	Poland	8 (2013-2020)	6	40
9.	Bank 9	Sweden	9 (2013-2021)	8	59
10.	Bank 10	Estonia	6 (2016-2021)	4	23
11.	Bank 11	Netherlands	8 (2014-2021)	39	308
12.	Bank 12	United Kingdom	6 (2016-2021)	4	21
13.	Bank 13	Slovenia	8 (2014-2021)	10	81
14.	Bank 14	Sweden	3 (2013-2015)	2	6
15.	Bank 15	Sweden	9 (2013-2021)	17	153
16.	Bank 16	Sweden	9 (2013-2021)	14	89
17.	Bank 17	Sweden	9 (2013-2021)	8	70
18.	Bank 18	Netherlands	9 (2013-2021)	6	54
			127		1,197

Sample details – Table 1

Panel B: Voluntarily disclosers

	Firm	Headquarter country	Industry	Years disclosed	Number of countries disclosed (mean)	Firm-country-year observations
1.	Firm 1	Netherlands	Financials	2 (2020-2021)	23	46
2.	Firm 2	UK	Materials	3 (2018-2020)	46	138
3.	Firm 3	Australia	Materials	1 (2020)	30	30
4.	Firm 4	UK	Energy	2 (2019-2020)	81	161
5.	Firm 5	UK	Telecommunications	4 (2017-2020)	19	74
6.	Firm 6	Italy	Energy	2 (2020-2021)	41	81
7.	Firm 7	Italy	Energy	4 (2017-2020)	69	277
8.	Firm 8	Spain	Utilities	3 (2019-2021)	27	82
9.	Firm 9	UK	Utilities	3 (2019-2021)	5	15
10.	Firm 10	Netherlands	Financials	4 (2018-2021)	25	98
11.	Firm 11	Denmark	Energy	2 (2020-2021)	10	20
12..	Firm 12	Netherlands	Health Care	2 (2020-2021)	74	148
13.	Firm 13	Spain	Energy	3 (2018-2020)	45	135
14.	Firm 14	Australia	Materials	3 (2018-2020)	49	146
15.	Firm 15	Sweden	Bank	2 (2020-2021)	19	37
16.	Firm 16	Netherlands	Energy	3 (2018-2020)	97	292
17.	Firm 17	UK	Financials	6 (2015-2020)	6	36
18.	Firm 18	Sweden	Banks	2 (2020-2021)	15	29
19.	Firm 19	Sweden	Banks	2 (2020-2021)	11	22
20.	Firm 20	Spain	Telecommunications	2 (2019-2020)	18	35
21.	Firm 21	UK	Telecommunications	3 (2016-2018)	61	182
				58		2,084

Sample details – Table 1

Panel C: Sample composition by headquarter country and year

Country		Firms	%	Number of CbCRs by year									
				2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
EU banks (CRD IV disclosures)	Belgium	1	5.6%	-	-	1	1	1	1	1	1	1	7
	Estonia	1	5.6%	-	-	-	1	1	1	1	1	1	6
	Netherlands	4	22.2%	1	2	2	3	3	4	4	3	3	25
	Norway	2	11.1%	-	-	1	1	2	2	2	2	2	12
	Poland	1	5.6%	1	1	1	1	1	1	1	1	-	8
	Portugal	1	5.6%	-	1	1	1	1	1	1	1	1	8
	Slovenia	1	5.6%	-	1	1	1	1	1	1	1	1	8
	Sweden	6	33.3%	5	6	6	5	5	5	5	5	5	48
	UK	1	5.6%	-	-	-	1	1	1	1	1	1	6
Total	9	18	100.0%	7	11	13	15	16	17	17	16	15	127
Voluntary CbCR disclosers	Australia	2	9.5%	-	-	-	-	-	1	1	2	-	4
	Denmark	1	4.8%	-	-	-	-	-	-	-	1	1	2
	Italy	2	9.5%	-	-	-	-	1	1	1	2	1	6
	Netherlands*	4	19.0%	-	-	-	-	-	1	1	3	3	8
	Spain	3	14.3%	-	-	-	-	-	1	3	3	1	8
	Sweden	3	14.3%	-	-	-	-	-	-	-	3	3	6
	UK	6	28.6%	-	-	1	2	3	5	6	6	1	24
Total	7	21	100.0%	-	-	1	2	4	9	12	20	10	58

Initial results – PBT determinants (Table 2)

Panel A: EU banks (full sample)

Dep. Var.	PBT						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TURNOVER	0.503 (0.151)	0.961*** (0.003)	0.443 (0.149)	- -	1.047*** (0.000)	- -	- -
EMP_NUM	-0.139 (0.373)	0.101 (0.736)	- -	0.018 (0.900)	- -	0.956*** (0.000)	- -
ASSETS_TOTAL	0.606** (0.021)	- -	0.552** (0.032)	0.878*** (0.000)	- -	- -	0.891*** (0.000)
Intercept	0.002 (0.955)	-0.002 (0.950)	0.000 (0.992)	0.008 (0.836)	-0.001 (0.977)	0.012 (0.775)	0.008 (0.831)
Year FE	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y
Clustered SEs	Y	Y	Y	Y	Y	Y	Y
Observations	1,197	1,197	1,197	1,197	1,197	1,197	1,197
R ²	0.454	0.431	0.453	0.443	0.430	0.359	0.443

Initial results – PBT determinants (Table 2)

Panel B: Voluntary disclosers (excludes three non-disclosers of third-party revenues)

Dep. Var.	PBT						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
REVENUE_TP	-0.339 (0.362)	0.037 (0.905)	-0.319 (0.372)	- -	0.679*** (0.000)	- -	- -
EMP_NUM	0.050 (0.879)	0.786*** (0.005)	- -	-0.144 (0.666)	- -	0.819*** (0.000)	- -
ASSETS_TANG	1.281*** (0.002)	- -	1.308*** (0.000)	1.149*** (0.002)	- -	- -	1.019*** (0.000)
Intercept	-0.142 (0.287)	-0.144 (0.304)	-0.142 (0.287)	-0.141 (0.285)	-0.145 (0.316)	-0.144 (0.304)	-0.141 (0.286)
Year FE	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y
Clustered SEs	Y	Y	Y	Y	Y	Y	Y
Observations	1,883	1,883	1,883	1,883	1,883	1,883	1,883
R ²	0.030	0.026	0.030	0.029	0.024	0.026	0.029

Initial results – PBT determinants (Table 2)

Panel C: Voluntary disclosers (replaces third-party revenues with total revenues)

Dep. Var.	PBT						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
REVENUE_TOTAL	-0.909 (0.219)	-0.093 (0.873)	-0.645 (0.277)	- -	0.692*** (0.008)	- -	- -
EMP_NUM	0.445 (0.234)	0.902** (0.035)	- -	0.007 (0.979)	- -	0.822*** (0.000)	- -
ASSETS_TANG	1.491*** (0.001)	- -	1.641*** (0.001)	1.045*** (0.000)	- -	- -	1.051*** (0.000)
Intercept	-0.137 (0.311)	-0.139 (0.327)	-0.137 (0.308)	-0.137 (0.307)	-0.140 (0.335)	-0.139 (0.323)	-0.137 (0.306)
Year fixed effects	Y	Y	Y	Y	Y	Y	Y
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Clustered SEs	Y	Y	Y	Y	Y	Y	Y
Observations	1,957	1,957	1,957	1,957	1,957	1,957	1,957
R ²	0.031	0.026	0.031	0.029	0.023	0.026	0.029

Initial results

- Panel A
 - Observable measures do a credible job of predicting country-level pre-tax profits i.e., R-squared is 0.454
 - Total Assets does most of the work in explaining pre-tax profits
 - Turnover is significant if Total Assets is dropped in a two-factor formula
- Panels B and C
 - R-squared drops significantly to around 0.03
 - Tangible Assets does most of the work in explaining pre-tax profits
 - Employee Numbers is significant if Tangible Assets is dropped in a two-factor formula

Initial results

- Overall
 - Results consistent with the conclusion in Hines (2010) that a large amount of variation in country-level profitability remains unexplained by country-level factors
 - Therefore, formulary apportionment factors may misattribute income
- However, observable pre-tax profits is potentially subject to noise and bias
 - Observable pre-tax profit in a country is after profit shifting (or other earnings management) has occurred
 - Amount of profit shifting (if any) is unobservable
- A one-size fits all formula is unlikely to be appropriate for all industries - industry specific formulas may be required

Initial results – Tax haven presence (Table 3: EU banks)

This table presents the aggregate profit/(loss) before tax recognised in tax havens over the sample period (2013-2021). Amounts are in millions of Euros.

	Tax haven	Aggregate pre-tax profits/(losses)		Tax haven	Aggregate pre-tax profits/(losses)
1	Andorra	-	28	Liberia	-
2	Anguilla	-	29	Liechtenstein	-
3	Antigua and Barbuda	-	30	Luxembourg	€1,749
4	Aruba	-	31	Macao	€0
5	Bahamas	-	32	Maldives	-
6	Bahrain	-	33	Malta	-
7	Barbados	-	34	Marshall Islands	-
8	Belize	-	35	Mauritius	€646
9	Bermuda	-	36	Monaco	-
10	Botswana	€0	37	Montserrat	-
11	British Virgin Islands	-	38	Nauru	-
12	Brunei Darussalam	-	39	Netherlands	€25,133 (€1,550)^
13	Cape Verde	-	40	Netherlands Antilles	-
14	Cayman Islands	-	41	Niue	-
15	Cooks Islands	-	42	Palau	-
16	Costa Rica	-	43	Panama	-
17	Cyprus	-	44	Samoa	-
18	Dominica	-	45	San Marino	-
19	Gibraltar	-	46	Seychelles	-
20	Grenada	-	47	Singapore	€1,142
21	Guernsey	€55	48	St Kitts and Nevis	-
22	Hong Kong	€461	49	St Lucia	-
23	Ireland	€557	50	St Vincent and Grenadines	-
24	Isle of Man	-	51	Switzerland	€1,026
25	Jersey	€ (5)	52	US Virgin Islands	-
26	Latvia	€1,344	53	Uruguay	-
27	Lebanon	-	54	Vanuatu	-
				TOTAL	€32,108 (€8,525)^

* Total of €32,108 (€8,525) represents 22.0% (5.8%) of the total profit/(loss) before tax of €145,937 reported by sample banks for the years formulary apportionment could be used during the sample period (2013-2021).

^ Adjusted for €23,583 of profits recognised in the Netherlands by four banks that are all headquartered in the Netherlands.

Initial results – Formulary apportionment redistribution (Table 4: EU banks)

Panel A: Winners

Jurisdiction	Profit before tax reallocated (>€200m)	Change
Belgium	€2,062	29.1%
Estonia	€223	8.4%
Italy	€834	>100%
Latvia	€825	61.4%
Lithuania	€1,042	49.6%
Netherlands	€2,550	10.1%
Philippines	€366	>100%
Poland	€776	16.6%
Portugal	€1,224	>100%
Singapore	€306	26.8%
Turkey	€599	37.1%
Others	€1,821	
TOTAL	€12,628	

Initial results – Formulary apportionment redistribution (Table 4: EU banks)

Panel B: Losers

Jurisdiction	Profit before tax reallocated (>€200m)	Change
Australia	€1,318	44.0%
Denmark	€279	11.2%
Finland	€337	15.7%
Germany	€3,150	30.6%
Ireland	€223	40.0%
Luxembourg	€397	22.7%
Mauritius	€563	87.1%
Mozambique	€666	78.3%
Norway	€391	2.3%
Russia	€236	48.4%
Sweden	€3,416	7.9%
Switzerland	€603	58.7%
Ukraine	€220	86.0%
Others	€829	
TOTAL	€12,628	

Initial results – FA redistribution (Table 5: EU banks)

Panel A: Tax havens

Jurisdiction	Pre-tax profits reallocated TO	Pre-tax profits reallocated FROM	Net reallocation
Tax havens	€3,688	(€1,869)	€1,819
Non-tax havens	€8,940	(€10,759)	(€1,819)
	€12,628	(€12,628)	-

Panel B: Tax havens adjusted for pre-tax profits recognised in the Netherlands by four banks headquartered in the Netherlands

Jurisdiction	Pre-tax profits reallocated TO	Pre-tax profits reallocated FROM	Net reallocation
Tax havens	€1,138	(€2,573)	(€1,435)
Non-tax havens	€12,194	(€10,759)	€1,435
	€13,332	(€13,332)	-

** Assuming a tax rate differential of 5% / 10% / 15%, additional corporate tax of approximately €71.75m / €143.50m / €215.25m would have been collected by tax authorities over the sample period (2013-2021)

Initial results – Tax haven presence (Table 6: Voluntary disclosers)

This table presents the aggregate profit/(loss) before tax recognised in tax havens over the sample period (2015-2021). Amounts are in millions of Euros.

Tax haven		Aggregate pre-tax profits/(losses)	Tax haven		Aggregate pre-tax profits/(losses)
1	Andorra	-	28	Liberia	€0
2	Anguilla	-	29	Liechtenstein	-
3	Antigua and Barbuda	-	30	Luxembourg	(€91,246)
4	Aruba	(€17)	31	Macao	€49
5	Bahamas	€2,134	32	Maldives	-
6	Bahrain	(€7)	33	Malta	€305
7	Barbados	(€195)	34	Marshall Islands	-
8	Belize	-	35	Mauritius	(€3,258)
9	Bermuda	€1,018	36	Monaco	-
10	Botswana	€493	37	Montserrat	-
11	British Virgin Islands	€0	38	Nauru	-
12	Brunei Darussalam	(€83)	39	Netherlands	(€13,700), (€22,867)^
13	Cape Verde	-	40	Netherlands Antilles	-
14	Cayman Islands	(€6,818)	41	Niue	-
15	Cooks Islands	€0	42	Palau	-
16	Costa Rica	€4	43	Panama	€171
17	Cyprus	(€104)	44	Samoa	-
18	Dominica	-	45	San Marino	-
19	Gibraltar	€1	46	Seychelles	-
20	Grenada	-	47	Singapore	€9,715
21	Guernsey	€125	48	St Kitts and Nevis	-
22	Hong Kong	€139	49	St Lucia	(€26)
23	Ireland	€143	50	St Vincent and Grenadines	-
24	Isle of Man	(€35)	51	Switzerland	€4,952
25	Jersey	€30	52	US Virgin Islands	-
26	Latvia	€278	53	Uruguay	€231
27	Lebanon	(€50)	54	Vanuatu	-
			TOTAL		(€95,751), (€104,918)^

* Total of (€95,751) represents 71.5% of the total profit/(loss) before tax of €133,874 reported by sample firms for the years formulary apportionment could be used during the sample period (2015-2021).

^ Adjusted for profits of €9,167 recognised in the Netherlands by three firms headquartered in the Netherlands.

Initial results – FA redistribution (Table 7: Voluntary disclosers)

Panel A: Winners

Jurisdiction	Profit before tax reallocated (>€200m)	Change
Albania	€285	>100.0%
Argentina	€1,926	>100.0%
Barbados	€207	>100.0%
Botswana	€254	51.4%
Brazil	€7,516	>100.0%
Canada	€8,278	>100.0%
Cayman Islands	€6,817	100.0%
Chile	€1,152	28.4%
Congo	€1,535	>100.0%
France	€521	>100.0%
Germany	€3,567	>100.0%
Ghana	€407	>100.0%
Iceland	€414	>100.0%
India	€10,732	>100.0%
Italy	€10,400	>100.0%
Latvia	€329	>100.0%
Lithuania	€586	>100.0%
Luxembourg	€91,389	>100.0%
Madagascar	€312	>100.0%
Mauritania	€1,103	>100.0%
Mauritius	€3,260	>100.0%
Mexico	€1,403	>100.0%
Mongolia	€6,060	>100.0%
Netherlands	€15,906	>100.0%
North Africa Region	€638	64.5%
Peru	€357	>100.0%
Qatar	€307	>100.0%
Senegal	€989	>100.0%
Spain	€340	5.4%
Trinidad & Tobago	€3,806	>100.0%
Turkey	€327	>100.0%
U.K.	€57,108	>100.0%
U.S.A.	€30,549	>100.0%

- Issue arises when firms adopt a ‘bottom up’ approach to preparing their CbCR and do not provide elimination adjustments or adequate explanation regarding eliminations
- Additional detail in CbCRs was reviewed so adjustments could be made for the eliminations
- Equation (3) was then re-estimated for this sample

Initial results – Tax haven presence (Table 9: Voluntary disclosers)

	Tax haven	Aggregate pre-tax profits/(losses)		Tax haven	Aggregate pre-tax profits/(losses)
1	Andorra	-	28	Liberia	€0
2	Anguilla	-	29	Liechtenstein	-
3	Antigua and Barbuda	-	30	Luxembourg	€4,594
4	Aruba	(€17)	31	Macao	€49
5	Bahamas	€2,134	32	Maldives	-
6	Bahrain	(€7)	33	Malta	€304
7	Barbados	(€195)	34	Marshall Islands	-
8	Belize	-	35	Mauritius	€194
9	Bermuda	€1,018	36	Monaco	-
10	Botswana	€493	37	Montserrat	-
11	British Virgin Islands	€0	38	Nauru	-
12	Brunei Darussalam	(€83)	39	Netherlands	€1,603, (€3,754)^
13	Cape Verde	-	40	Netherlands Antilles	-
14	Cayman Islands	€8	41	Niue	-
15	Cooks Islands	€0	42	Palau	-
16	Costa Rica	€4	43	Panama	€171
17	Cyprus	(€104)	44	Samoa	-
18	Dominica	-	45	San Marino	-
19	Gibraltar	€1	46	Seychelles	-
20	Grenada	-	47	Singapore	€9,715
21	Guernsey	€133	48	St Kitts and Nevis	-
22	Hong Kong	€138	49	St Lucia	(€26)
23	Ireland	€118	50	St Vincent and Grenadines	-
24	Isle of Man	(€35)	51	Switzerland	€4,953
25	Jersey	€30	52	US Virgin Islands	-
26	Latvia	€278	53	Uruguay	€231
27	Lebanon	(€50)	54	Vanuatu	-
				TOTAL	€25,651, (€20,294)^

* Total of €25,651 represents 19.2% of the total profit/(loss) before tax of €133,874 reported by sample firms for the years formulary apportionment could be used during the sample period (2015-2021).

^ Adjusted for profits of €5,357 recognised in the Netherlands by three firms headquartered in the Netherlands.

Initial results – FA redistribution (Table 10: Voluntary disclosers)

Panel A: Winners

Jurisdiction	Profit before tax reallocated (>€200m)	Change
Albania	€275	>100.0%
Argentina	€1,926	>100.0%
Barbados	€207	>100.0%
Botswana	€254	51.4%
Brazil	€7,516	>100.0%
Canada	€8,278	>100.0%
Cayman Islands	€0	-
Chile	€1,152	28.4%
Congo	€1,512	>100.0%
France	€521	>100.0%
Germany	€3,468	>100.0%
Ghana	€407	>100.0%
Iceland	€414	>100.0%
India	€6,009	>100.0%
Italy	€9,814	>100.0%
Latvia	€329	>100.0%
Lithuania	€586	>100.0%
Luxembourg	€0	-
Madagascar	€312	>100.0%
Mauritania	€1,103	>100.0%
Mauritius	€0	-
Mexico	€1,404	>100.0%
Mongolia	€6,060	>100.0%
Netherlands	€634	39.60%
North Africa Region	€638	64.5%
Peru	€357	>100.0%
Qatar	€0	-
Senegal	€989	>100.0%
Spain	€340	5.4%
Trinidad & Tobago	€3,806	98.0%
Turkey	€326	>100.0%
U.K.	€6,870	>100.0%
U.S.A.	€30,549	>100.0%

Panel B: Losers

Jurisdiction	Profit before tax reallocated (>€200m)	Change
Algeria	€1,007	>100.0%
Angola	€1,477	>100.0%
Australia	€15,511	38.0%
Austria	€271	89.4%
Azerbaijan	€1,280	>100.0%
Bahamas	€1,996	93.5%
Bermuda	€1,004	98.7%
China	€1,018	67.7%
Colombia	€1,173	68.6%
Denmark	€2,668	56.0%
Egypt	€7,545	96.1%
Hungary	€344	94.7%
Indonesia	€662	83.3%
Kazakhstan	€3,295	88.1%
Kenya	€1,033	95.8%
Kuwait	€441	96.3%
Libya	€8,535	98.4%
Luxembourg	€4,453	96.9%
Malaysia	€1,696	70.4%
Malta	€296	96.9%
Middle East Region	€6,043	>100.0%
New Zealand	€454	72.2%
Nigeria	€2,264	77.3%
Norway	€3,328	92.3%
Oman	€6,657	99.3%
Panama	€205	>100.0%
Poland	€286	88.9%
Portugal	€221	62.8%
Russia	€581	68.2%
Singapore	€251	2.6%
South Africa	€4,002	38.4%
Spain	€6,288	48.8%

Initial results – FA redistribution (Table 11: Voluntary disclosers)

Panel A: Tax havens

Jurisdiction	Pre-tax profits reallocated TO	Pre-tax profits reallocated FROM	Net reallocation
Tax havens	€1,962	(€13,739)	(€11,777)
Non-tax havens	€98,656	(€86,879)	€11,777
	€100,618	(€100,618)	-

Panel B: Tax havens adjusted for pre-tax profits recognised in the Netherlands by three firms who are headquartered in the Netherlands (Aegon, Philips, Shell).

Jurisdiction	Pre-tax profits reallocated TO	Pre-tax profits reallocated FROM	Net reallocation
Tax havens	€5,048	(€13,739)	(€8,690)
Non-tax havens	€98,656	(€89,966)	€8,690
	€103,705	(€103,705)	-

**

** Assuming a tax rate differential of 5% / 10% / 15%, additional corporate tax of approximately €434.50m / €869.00m / €1,303.50m would have been collected by tax authorities over the sample period (2016-2021)

Next steps

- Given controversy surrounding tax haven lists, analyse the results from estimating Equation (3) for 'low-tax' vs 'high-tax' countries i.e., define 'low-tax' and 'high-tax' in terms of ETRs (e.g., Clausing (2020) defines 'havens' as countries with ETRs <10%) or statutory corporate tax rates of countries
- Re-estimate Equation (3) with different allocation keys and formula variations e.g., $\frac{1}{2} \text{SALES} + \frac{1}{2} \text{EMPLOYEES}$
- Re-estimate Equations (1)-(3) for the sub-samples (four EU banks and two voluntary disclosers) who disclose employee costs in addition to employee numbers
 - i.e., $\Delta \text{PBT} = \frac{1}{3} \text{SALES} + \frac{1}{3} \text{ASSETS} + \frac{1}{6} \text{EMPLOYEES} + \frac{1}{6} \text{EMPLOYEE COST}$
- Voluntary disclosers – analysis by industry

Questions?

