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Assessing the impact of the

# CCCTB

European tax base shifts  
under a range of policy scenarios



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# ASSESSING THE IMPACT OF THE C(C)CTB: EUROPEAN TAX BASE SHIFTS UNDER A RANGE OF POLICY SCENARIOS

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## SUMMARY OF THE MAIN FINDINGS AND POLICY RECOMMENDATIONS

We evaluate the European Commission's proposed Common Consolidated Corporate Tax Base (CCCTB), or an alternative without full consolidation (the Common Corporate Tax Base, or CCTB).

Our primary finding is that the coverage limitations of the Orbis dataset are serious – despite being the best public source – and are shown to gravely understate the degree of profit-shifting by US multinationals in particular. *Analysis using this data, including our own presented here, should be treated with significant caution – especially for policy purposes.*

Even with that caveat, however, two important results emerge from our analysis. First, loss consolidation is likely to impose large and immediate revenue costs, with no offsetting benefits that would even approach the same scale. Loss consolidation without a contemporaneous move to a unitary basis would be illogical, and also costly: overall, the simulation results suggest that the sum of positive profits would decrease by 21 % as a consequence of the loss consolidation (in our sample, for the EU as a whole from a total of almost 1000 billion euro to less than 800 billion euro). Second, an application of a unitary approach at an EU level only would overlook the extent of profit-shifting out of the EU, and could lock in unnecessary revenue losses. Extending the approach to a worldwide one, for example through full-inclusion controlled foreign corporation (CFC) rules, would simultaneously deal with profit-shifting within and out of the EU, and appears to offer the best prospect for revenue-positive, welfare-enhancing reform. Major EU profit-shifting jurisdictions such as Luxembourg, Ireland and the Netherlands would inevitably experience revenue losses due to the unwinding of their deliberately engineered positions.

The most immediate recommendation for policymakers is to address the weakness of the evidence base by taking advantage of the new, comprehensive data resource created by the introduction of an OECD standard for country-by-country reporting. Collating the data received by each EU member state

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tax authority will allow a precise analysis of the impacts of the CCCTB and CCTB proposals, within a matter of a few months; going ahead without such analysis would be deeply irresponsible.

## 1. INTRODUCTION

Following the global financial crisis that emerged in 2008, and the subsequent fiscal pressures facing many high-income countries in particular, public and political scrutiny came to bear on the extent of tax avoidance by multinational companies. In 2012, the G20 group of countries began to develop the response which eventually became the OECD Base Erosion and Profit Shifting (BEPS) action plan, with the support of many lower-income countries where multinational profit-shifting had long been recognised as a major revenue threat. The BEPS action plan ran from 2013 and concluded in 2015.

There is growing evidence that BEPS has failed. Initial ambition was thwarted in a number of areas by the lack of full cooperation between OECD member states, so that the resulting measures lack the necessary technical power. Politically, the perception of failure has led lower-income countries to coalesce around the G77 proposals for greater tax policy responsibility to be vested in the UN rather than the OECD. US policymakers are considering quite radical and untested proposals for corporate tax that are entirely at odds with agreed BEPS actions; and EU policymakers seek to go beyond BEPS in a range of areas, including the adoption of a common corporate tax base within the Union.

Common to each of these political **responses is the desire to challenge the arm's length principle which is at the heart of the OECD-set rules for international tax and to challenge, in effect, the decision taken at the League of Nations in the interwar years that set the world on a path to separate accounting rather than unitary taxation (Picciotto, 2013).** A unitary approach treats the multinational group itself as the profit-maximising unit, and the group profits as the tax base to then be allocated between jurisdictions in some fashion. Separate accounting, in contrast, rests on a treatment of individual entities within a multinational group as if they were individually profit-maximising – and hence the requirement for groups to account separately for each entity, and to report profits as they would be **distributed if the entities were truly operating at arm's length from each other, and** pricing intra-group transactions accordingly.

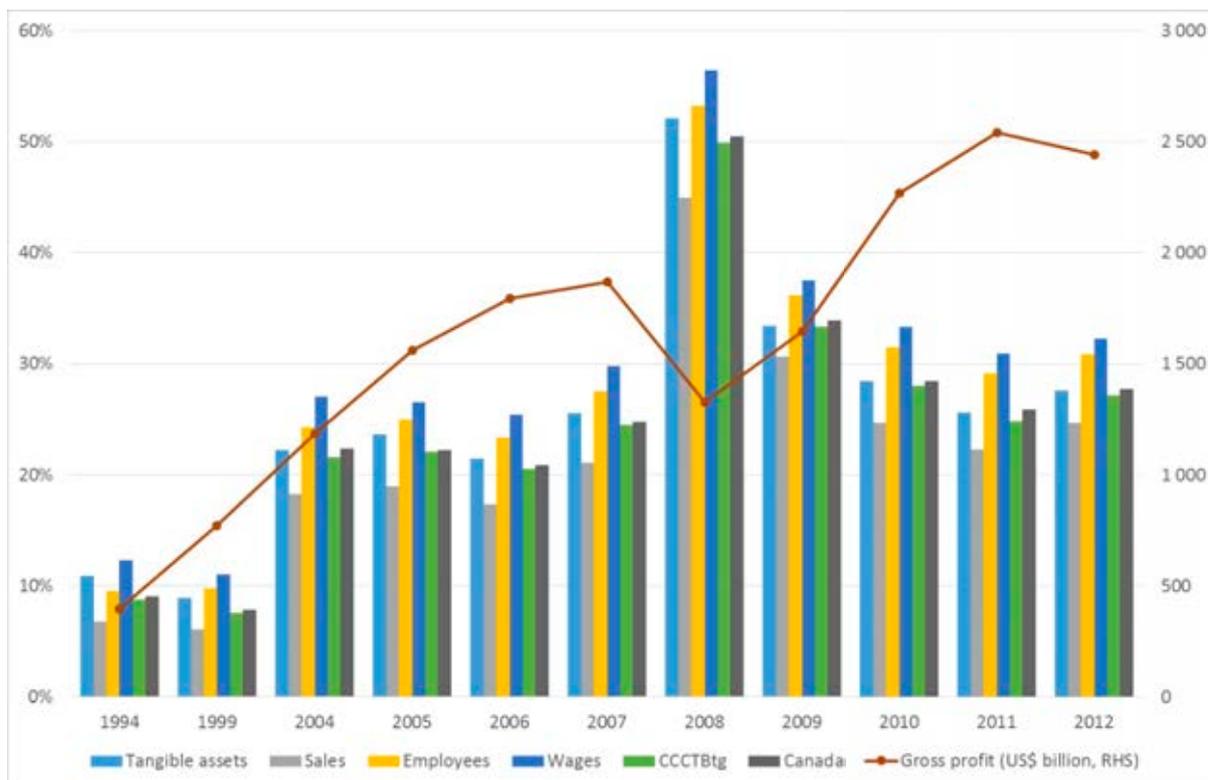
The central strength of the BEPS action plan lay in the initial agreement to collaborate, and the specific, single aim of reforming international corporate tax rules so that **they** “better align rights to tax with **economic activity**” (OECD 2013: 11). While there is a broad consensus that the BEPS process has fallen far short of the changes needed, an important element of progress has been the creation of a standard for country-by-country reporting by multinationals, based on an original proposal from the Tax Justice Network (Murphy, 2003). As things stand, this country-by-country data is only provided privately to some tax authorities – but there are growing moves, including a strongly supported European Parliament position, to make the data publicly available as originally intended. At this point, multinationals (and their advisers, including the big four accounting firms) and tax authorities **themselves would become publicly accountable for the degree of profit ‘misalignment’, and annual progress in reducing it.**

The existing evidence already confirms clearly not only the existence of serious misalignment, but also its sharp growth over recent decades. For example, Cobham & Janský (2017) use data on US multinationals to show the increasing extent of profit misalignment as a share of gross profits for a number of years and indicators of economic activity.

As figure 1 shows, depending on the measure of economic activity used, some 5% to 10% of US **multinationals’ global profits were misaligned in the 1990s.** By the early 2010s, this misalignment had grown to as much as 25% to 30% of their global profits – from a relatively marginal problem, to a first-order economic issue. **If other countries’ multinationals are equivalently aggressive in their tax strategy, profit-shifting may amount in total to a material distortion to global economic accounts in the order of 5% or more.**

The impact is also far from uniformly distributed. Cobham & Janský (2017) find that for US multinationals, only a handful of jurisdictions (including Ireland, Luxembourg and the Netherlands) consistently lay claim to substantially higher shares of global profits than their share of the companies' economic activity – and that each of these jurisdictions levy an effective tax rate below 5%, typically below 2%. The losses are felt in most other countries, at all levels of per capita income. In absolute terms, the losses are greatest in the biggest high-income economies; but in relation to GDP, and to existing tax revenues, the losses are greatest in lower-income countries.

**Figure 1 The extent of profit misalignment (% of gross profits)**



Source: Cobham & Janský (2017) on the basis of the Bureau of Economic Analysis data.

The leading policy proposal in response to these misalignments is to take a unitary approach to multinational tax. This treats companies' profits as arising at the unit of the group, rather than individual subsidiaries, and so replaces the requirement to construct arm's length prices for intra-group transactions, with the requirement for a basis to allocate profits across countries in which the group has operations. A number of countries already use such an approach at a subnational level. US states, for example, use a range of formulas to calculate their share of companies' US economic activity and therefore of the tax base, while Canadian provinces have a single agreed formula. The formula used to allocate taxable profit between Canadian provinces is an equally-weighted split between sales and wages.

The European Commission's earlier proposal for a unitary taxation system envisaged a single formula for EU member states to apportion the tax base among themselves. The European Commission (2011) proposed a formula for the CCCTB, which weighted one-third tangible assets, one-third sales, and one-third split equally between compensation costs and (number of) employees. This formula remains the same in the current proposal, European Commission (2016), but with a number of other changes. There are now two proposals for Council Directives: one on a CCCTB, and one on a CCTB.

Estimating the impact from such a change to tax policy is inherently difficult. Two main approaches can be identified. The first approach takes advantage of computable general equilibrium (CGE)

models, such as the CORTAX model produced by CPB Netherlands and used by the European Commission (2016), which is designed to evaluate the effects of tax reform and assumes that individual agents within the economy use optimising behaviour. CGE models rely on a number of structural parameters that capture economic agents' behavioural responses to tax changes, and thus are only reliable insofar as the parameters are correctly specified and estimated. Criticisms of CGE **models tend to focus on the extent to which models' outputs are** dependent upon the assumptions made when constructing the underlying model – and in particular the combination of high sensitivity to, and often low visibility of, these assumptions, when sweeping policy claims are made.

The European Commission (2016) provides estimates of the impact of introducing the CCCTB. In its baseline scenario it suggests that **the CCCTB has “very clear advantages compared to the no actions scenario”**. Profit-shifting will essentially be eliminated. Accordingly the CCCTB boosts wages and employment, and reduces the cost of capital to boost investment. Aggregate GDP increases and hence economic welfare improves. This is the case for two scenarios, where the first includes only multinationals and the second includes all firms. In terms of tax revenue, the European Commission estimates that there will be a small decrease in total tax revenue (0.08% of GDP for the EU-28 as a whole). This is due to a fall in corporate tax revenues, largely offset by an increase in revenues from other taxes.

The alternative approach, as used in this paper, puts more emphasis on static comparisons, using comprehensive firm-level data to estimate the impact on tax bases for each country had countries been using the CCCTB in a previous period. These estimates are then compared to the actual tax bases observed during the period under study. A number of studies have used this methodology in order to assess the impact of formulary apportionment. For example, Mintz & Smart (2004) find that apportionment between Canadian provinces results in less profit-shifting. Clausing (2016) investigates formulary apportionment in the US and suggests that it is unlikely to generate significant changes in economic activity. Fuest, Hemmelgarn, & Ramb (2007), Devereux & Loretz (2008) and Nerudová, Solilová, & Dobranschi (2016) are examples of European-focused studies with findings of revenue effects for various apportionment formulas. Cobham & Loretz (2014) use the Orbis database of company balance sheets and find that apportioning profits according to measures of actual economic activity would result in a major redistribution of the tax base at the expense of a particular group of jurisdictions, and that international loss consolidation as proposed under the CCCTB could reduce the overall tax base by around 12 per cent.

Such analyses are subject to criticism that they do not sufficiently take into account the behavioural dynamics that would follow from the announcement of a major change in tax policy, and therefore lack the evidence at the starting point for policy changes, which may affect the ultimate equilibrium that will result. Relative certainty on these findings may, however, be preferable to the highly uncertain equilibrium analysis promised by CGE modelling. A major additional problem with any results based on firm-level data is the quality and coverage of that data – discussed in some detail in the following section.

Overall, the literature on the effects of formulary apportionment does not provide simple answers when it comes to estimating the impact on tax revenue for each member state. Policymakers should consider the assumptions that have been made for each study, recognising that the outcome of the CCCTB could differ significantly from the estimates provided in the literature.

The current study provides an assessment of a number of policy scenarios that could arise under the **European Commission's proposals, in terms of tax base reallocations among EU member states**. In addition, the study points to possible limitations in the proposals, leading to suggestions for improvement. The analysis uses data extracted from the Orbis database, using a modified version of the approach taken in Cobham & Loretz (2014). This allows us to evaluate the extent to which taxable profits would be redistributed, if they were to be aligned with the level of real economic activity as

the CCCTB indicates. While there are important caveats about the quality and coverage of the data, they are the best available at present for this analysis. We use this framework to assess a set of specific issues and scenarios. We focus on various apportionment formulas and estimate the effects of varying the longstanding proposal for formulary apportionment under the CCCTB, which combines weighted indicators of sales, tangible assets and employment, with two other possible apportionment formulas. Before the various apportionment formulas, we investigate the loss offsetting between member states as a natural first step and, after the formulas, we finish with an exploratory analysis of the intra- and extra-EU application of the unitary taxation.

Section 2 details the data used, including its limitations. Section 3 presents the model of Cobham & Loretz (2014) to be used, and the central results, before exploring the set of alternative scenarios. Section 4 presents the key findings, and then provides additional context using the global findings from Cobham & Loretz (2014), and the analysis of US multinationals of Cobham & Janský (2017), to deepen understanding of the policy position. A final section concludes with policy recommendations.

#### Box 1. **The European Commission's C(C)CTB**, in context

**The European Commission's proposed Common Consolidated Corporate Tax Base (CCCTB)** is a single set of rules to calculate companies' taxable profits in the EU, allowing the filing of a single tax return. The consolidated taxable profits will be shared between the Member States in which the **group is active, using an apportionment formula. If the formula reflects companies' economic activity** (i.e. sales and employment), this would guarantee in effect that profits are aligned with activity – the single goal of the G20/OECD Base Erosion and Profit Shifting (BEPS) process.

European policymakers are actively considering the introduction of the CCCTB, or an alternative without full consolidation (the CCTB), as a means to reduce profit misalignment – at least within the EU. One of the implications of this proposal relates to the Anti Tax Avoidance Directive (ATAD). It seems likely that the introduction of the CCTB will mean that for all companies falling under the directive, the ATAD rules are no longer the minimum standard, but the set rule beyond which member states are not allowed to go – meaning that additional steps to limit avoidance might not be possible. A particular concern discussed below is whether this would prevent effective CFC rules.

This assessment does not focus on the potential for multinationals to pursue alternative avoidance approaches under the CC(C)TB. Making misalignment harder to achieve is likely to increase competition for the real location of investment. In addition, there are significant questions over the potential for multinationals to exploit national differences in accounting schemes (as they do currently with differences in national legislation) in order to achieve lower overall tax liability. These and related questions raised by Prof. Richard Murphy must be addressed in any final agreement on the CC(C)TB.

## 2. DATA

We use the largest commercially-available database of company balance sheets, Orbis, provided by Bureau van Dijk. This is the best available global dataset, although it does suffer from some shortcomings such as selection bias described, for example, by Cobham & Loretz (2014) or Kalemli-Ozcan, Sorensen, Villegas-Sanchez, Volosovych, & Yesiltas (2015). The coverage is severely limited among developing countries, and increasingly so for lower-income countries (for which the level of reporting is insufficient to predict revenue consequences reliably) and it might therefore be worthwhile to complement it with alternatives as done by Cobham & Janský (2017).

Similarly to Cobham & Janský (2017), Clausing (2016) uses the Bureau of Economic Analysis data for activities of US multinationals to analyse profit-shifting, but also discusses the weaknesses of Orbis data. Clausing (2016) argues that Orbis includes extremely limited information for tax havens and that

analysis based on the data thus exclude many of the observations that are driving most of the income-shifting behaviour. This issue might be of slightly smaller concern in our sample since we focus on firms in the EU only, but we do observe below that some European countries often considered to be tax havens such as Luxembourg or Ireland seem to be relatively poorly represented in the sample and there are hardly any firms for Cyprus. This issue is of course of even higher concern when we or others use the Orbis data to investigate the impact of extending the approach worldwide, for example through CFC rules, where one needs to be much more cautious.

We use the same dataset as Cobham & Loretz (2014) with a different country coverage. While they use information for all worldwide firms available in the database, we use information only for firms located in the European Union, headquartered both within and outside the EU, and so the sample only includes companies from the 28 European countries – members of the European Union (as of 2017, i.e. including the United Kingdom), for which we seem to have similar coverage of companies compared to the study of Devereux & Loretz (2008) and a somewhat lower coverage than Cobham & Loretz (2014). We apply the same changes to the data as Cobham & Loretz (2014). We thus follow Devereux & Loretz (2008) who use only individual unconsolidated accounts and aggregate them to obtain the country-by-country information. We focus only on multinational groups defined as corporate groups that own at least one subsidiary in a different country.<sup>2</sup> Our dataset includes all EU-located majority-owned subsidiaries of a global owner, i.e. with ownership shares above 50 % (and this condition might imply somewhat lower coverage of companies than Cobham & Loretz (2014) as well as the impossibility of using this dataset to explore the effects of varying the current proposal's assumption of when an entity is considered part of a group, for example, to a 10% threshold). For each **company we know the company's location country and the location of its global owner; we exclude companies without information about their global owner.**

The above described changes result in a sample of 34,265 individual corporate entities in 19,223 groups. Table 1 shows the distribution of these firms and their owners across countries and regions. The companies reside in the 28 EU member countries and the global ultimate owners are based in 147 countries and territories, which we list according to regional groupings (with the exception of the EU), instead of a country-by-country table due to the large size of the sample.<sup>3</sup>

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<sup>2</sup> We also retain only multinational groups for which we have information for at least two companies, which implies dropping around 14 % of observations for companies for which we have identified a foreign global owner but have insufficient additional data.

<sup>3</sup> We use the World Bank classifications (as of July 2015) to divide both companies' and their global owners' countries into regions and income groups: low-income economies are defined as having GNI per capita, under the Atlas method, of \$1,045 or less in 2014; middle-income economies more than \$1,045 but less than \$12,736; high-income economies \$12,736 or more. Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of \$4,125. We also classify four high-income, non-OECD countries using United Nations National Accounts Main Aggregates Database, December 2013 data on per capita GDP: Anguilla and British Virgin Islands (Latin America & Caribbean), Gibraltar (Europe & Central Asia), Nauru (East Asia & Pacific).

Table 1. Number of firms in MNE groups, by location of the firms and their owner country groups

	EU	East Asia & Pacific	Other Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	North America	South Asia	Sub-Saharan Africa	Total
Austria	738	31	185	30	17	103	2	2	1108
Belgium	1033	47	33	28	8	143	7	4	1303
Bulgaria	301	9	60	68	11	43	0	16	508
Croatia	58	0	9	2	1	4	0	0	74
Cyprus	23	0	9	9	3	1	2	3	50
Czech Republic	733	32	134	39	11	74	0	26	1049
Denmark	936	80	181	29	25	157	4	7	1419
Estonia	229	4	38	21	2	19	0	1	314
Finland	336	12	27	1	0	32	1	1	410
France	1632	116	185	52	66	450	11	6	2518
Germany	2436	302	681	116	62	659	36	11	4303
Greece	95	3	9	3	2	18	0	1	131
Hungary	35	0	5	0	0	1	0	1	42
Ireland	459	38	18	51	3	275	3	5	852
Italy	1360	92	345	67	29	259	13	10	2175
Latvia	228	7	114	17	5	16	2	3	392
Lithuania	46	0	7	0	0	4	0	0	57
Luxembourg	625	25	59	85	13	152	3	4	966
Malta	352	12	29	25	8	31	1	2	460
Netherlands	1798	199	157	253	61	818	31	12	3329
Poland	989	32	67	21	14	132	1	12	1268
Portugal	558	18	39	47	11	104	1	29	807
Romania	1036	14	118	35	84	59	2	13	1361
Slovak Republic	340	5	24	4	1	21	0	1	396
Slovenia	60	3	7	2	3	6	0	0	81
Spain	1195	74	96	80	21	251	13	6	1736
Sweden	1033	44	274	23	8	165	5	5	1557
United Kingdom	2123	540	334	380	95	1996	64	68	5600
Total	20787	1739	3244	1488	564	5993	202	249	34266

Notes: The columns describe the country in which the subsidiary is located, while the rows describe the country of the group headquarters.

Source: Authors on the basis of the Orbis data.

We use a time window of nine years, namely from 2007 to 2015 (only a small number of observations was available for 2016 and so we do not use it). The data is pooled over the nine years and the estimations thus reflect all nine years (with one firm in the data set representing up to nine observations). However, for some companies not all the necessary information is available for all years. To maximise the coverage, we calculate the resulting tax base allocation for each apportionment formula separately, which results in different sample sizes for the different formulas. We thus restrict the sample only to observations that have information about all of the relevant characteristics. For example, in the case of a three-part CCCTB apportionment formula, the following characteristics are included: profit and loss before taxes, turnover, payroll, number of employees, and tangible assets. If any of the information is missing, the relevant observation for a firm in a given year is not included in the simulation of the CCCTB. Similarly with the other scenarios, the estimations for the Canadian formula, for example, are based on a sample of all firms for which profit, turnover and payroll variables are available.

Table 2 reports the basic statistics for the profit measure with all values (both positive and negative) and the apportionment factors and other indicators of economic activity, including only observations with non-negative values. This is in line with Cobham & Loretz (2014), who drop all observations with negative values for the apportionment factors (i.e. with the exception of profits). For each apportionment formula, only observations with available data are used in the estimation and shown in the results tables in the following section and we apply this logic also for Table 2, where we show information for all observations with available data (i.e. thus a number of observations and the underlying sample differ across the variables). For most factors we have the necessary information for between 10,000 and 20,000 distinct companies and between 5,000 and 10,000 groups. For payroll and EBIT (earnings before interest and taxes) the number of companies with available data is relatively low (it was so low for the costs of goods sold variable that we dropped it from our sample and, together with EBIT, these are the two variables not used by Cobham & Loretz (2014)).

Table 2. Descriptive statistics, observations for 2007-2015

	Observations	Mean	Standard deviation	Minimum	Maximum	Distinct companies	Distinct groups
Profit/loss before taxes	174619	10078	228680	-19269866	21947531	17582	9027
Turnover	146177	132872	1017437	0	73854761	14781	7655
Tangible assets	215509	15156	229662	0	37729781	21684	11655
Total assets	224754	443502	7568782	0	729167703	22613	12153
Payroll	104275	15960	67408	0	2875082	10592	5268
No. of employees	126950	244	1769	0	182865	12923	6515
Taxation	115033	2209	17370	0	1615343	11556	6256
EBIT	88939	14082	157251	0	15616509	8974	4575

Notes: All values except number of employees and the number of companies and groups are in thousand USD. The table includes all observations for profit/loss before taxes and only observations with non-negative values for other variables.

Source: Authors on the basis of the Orbis data.

**Table 3 reports the mean values by firm's country** as well as a number of firms in a given country. From the latter we see that there are some countries for which there are not many firms available, such as Cyprus and Lithuania. **Furthermore, for some countries' firms the data availability is very low** for some of the relevant variables and we are therefore not able to show some of the results for some additional countries such as Greece. Table 4 shows the country total shares in global total for observations for 2007-2015 for the same sample as is used for Table 3.

Table 3. Mean values by firm's country, observations for 2007-2015

	Number of firms	Profit/loss before taxes	Turnover	Tangible assets	Total assets	Payroll	No. of employees	Taxation	EBIT
Austria	9972	21641	127287	6322	428608	18635	201	1995	3668
Belgium	11727	12811	274637	15400	406170	21071	237	1288	5607
Bulgaria	4572	2544	36398	13527	113521	2178	161	179	1348
Croatia	666	3049	63552	30872	143068	7040	325	414	3420
Cyprus	450	53296	158636	11304	1446013		152	1381	64340
Czech Republic	9441	4793	61044	14910	89257	6365	318	621	3109
Denmark	12771	3827	109636	7451	229114	11570	133	101	669
Estonia	2826	1189	16874	4479	19869	1379	117	136	765
Finland	3690	4232	113430	18243	233352	17160	325	2420	4122
France	22662	7312	126111	10711	458731	15951	215	-324	2240
Germany	38727	17140	263987	10783	434825	29048	310	3934	5252
Greece	1179	744	114966	34882	231098		350	1879	4563
Hungary	369	9280	78023	27710	156578	9682	460	746	1294
Ireland	7668	11696	126162	32187	608185	16112	153	1310	12872
Italy	19575	-2863	171104	23409	886819	22111	468	1781	2916
Latvia	3528	540	9876	2775	21309	1003	66	24	496
Lithuania	513	1974	40420	7918	52313		123	398	2069
Luxembourg	8694	37294	66582	3366	1274457	5894	165	863	14903
Malta	4140	9284	88478	5934	160274	4313	133	2101	7633
Netherlands	29961	90756	160371	23732	908682	10190	35	27	4532
Poland	11412	5498	112569	27733	102888	7391	449	1149	5904
Portugal	7263	3966	54171	9049	77989	7188	250	1071	4207
Romania	12249	1802	27738	17192	37000	3083	143	440	2313
Slovak Republic	3564	5428	84910	24771	88838	8259	372	801	3823
Slovenia	729	4023	68453	16596	70141	10293	290	798	3880
Spain	15624	6585	181825	27508	845533	18840	361	541	5824
Sweden	14013	8351	80526	9358	194066	9248	106	1571	3529
United Kingdom	50400	8727	144407	10068	321848	22209	229	759	3011
Total	308385	10078	132050	15153	443389	15946	244	1032	4026

Notes: All values except number of employees and the number of companies and groups are in thousand USD. The table includes all observations for profit/loss before taxes and only observations with non-negative values for other variables.

Source: Authors on the basis of the Orbis data.

Table 4. Country total shares in global total (%), observations for 2007-2015

	Number of firms	Sum profit and loss before taxes	Sum profit and loss before taxes - positive only	Turnover	Payroll	Number of employees	Tangibles	Total assets
Austria	1.16	4.84	3.55	0.87	1.19	1.02	0.74	1.40
Belgium	6.66	16.46	12.40	13.58	8.66	5.90	6.48	17.31
Bulgaria	3.11	0.73	0.80	0.75	0.38	2.09	1.95	0.66
Croatia*	0.52	0.24	0.26	0.24	0.20	0.51	0.75	0.22
Czech Republic	5.06	3.35	2.50	2.36	1.91	5.58	3.86	1.56
Denmark	0.87	0.85	0.83	0.78	1.37	1.02	1.48	0.76
Estonia	0.66	0.06	0.06	0.07	0.06	0.18	0.09	0.04
Finland	1.99	1.96	1.56	1.51	2.29	2.27	1.50	1.17
France	8.52	8.34	8.08	9.76	9.11	6.17	5.11	7.94
Germany	9.87	16.37	17.16	18.22	19.37	14.05	10.17	15.97
Hungary*	0.28	0.15	0.18	0.14	0.15	0.43	0.35	0.18
Ireland	1.14	2.56	2.10	1.01	1.36	0.89	5.08	2.02
Italy	11.96	4.75	9.83	15.88	15.17	13.96	15.26	12.29
Latvia*	0.06	-0.01	0.00	0.00	0.00	0.01	0.02	0.00
Luxembourg*	0.54	2.78	2.08	0.50	0.43	0.32	0.15	3.52
Malta*	0.05	0.09	0.07	0.01	0.00	0.00	0.00	0.03
Netherlands*	0.59	3.73	3.05	1.25	0.42	0.27	5.14	2.60
Poland	3.25	3.57	2.78	2.54	1.54	5.17	4.40	1.49
Portugal	3.96	2.40	1.95	1.65	1.70	3.08	2.09	1.37
Romania	7.71	2.04	2.05	1.66	1.38	5.47	5.67	1.44
Slovak Republic	1.78	1.67	1.27	0.86	0.85	2.34	2.50	0.68
Slovenia	0.63	0.34	0.26	0.24	0.34	0.61	0.40	0.18
Spain	11.19	7.54	11.54	11.76	12.38	13.07	14.00	14.29
Sweden	5.38	1.95	2.20	1.72	3.24	2.37	1.91	1.93
United Kingdom	13.08	13.23	13.45	12.65	16.51	13.22	10.91	10.95

Notes: The table is based on the same sample as Table 3.

Source: Authors on the basis of the Orbis data.

The core of our analysis is shown in Tables 1-3, which is based on the Orbis data of firms located in the EU as described in the previous section. This is followed by results shown in the next section that utilises two other datasets. One is a dataset from the Bureau of Economic Analysis on activities of US multinationals used by Cobham & Janský (2017), which only has country-level information for US-headquartered firms, but does not suffer from some of the disadvantages of the Orbis data discussed above. The other is the Orbis dataset of firms located worldwide used by Cobham & Loretz (2014), which is a bit outdated with data covering 2003-2011, but has the advantage of also including firms headquartered outside the EU. Overall, these two datasets complement the main data set well, especially when exploring the effects of formulary apportionment not only within the EU, but also globally.

Box 2. Key aspects of the CC(C)TB proposals addressed and excluded from the analysis

The assessment in this paper addresses:

- Apportionment formula: the effects of varying the longstanding proposal for formulary apportionment under the CCCTB combines weighted indicators of sales, tangible assets and employment, for example by considering the Canadian formula; and
- Loss offsetting between Member States.

We also discuss some of the caveats regarding the quality and coverage of the data above that do not enable us to provide a full assessment of the following specific aspects of the policy proposal:

- Group structure and membership: the analysis does not explore the effects of varying the current proposal that an entity be considered part of a group if the group holds more than 50% of voting rights and 75% capital ownership of profit distribution, for example to 10% thresholds in each case. Future work could explore this question, subject to data limitations.
- Size threshold for MNEs: the central analysis does not explore the effects of varying the current proposal **that an entity be included in CCCTB if it has annual global turnover of €750 million or more**; although a preliminary assessment considered this (see footnote 4).
- Intra/extra-EU application: finally, the analysis will explore the effects of considering apportionment purely within the EU, or globally; although this rests on comparison with other studies using more appropriate data.

### 3. METHODOLOGY AND RESULTS

We first focus on the consolidation of losses within the corporate groups and only then look at a number of ways of how the consolidated tax base can be apportioned and compare the simulation results of various scenarios.

We deal with the consolidation of losses within the corporate groups in a similar way to Cobham & Loretz (2014) and the description below heavily draws on their text. Under the current system of separate accounting the taxable income and tax liabilities of an individual firm  $j$  in country  $i$  need to be adjusted to reflect the loss carry forward and the asymmetric treatment of profit and losses. Let  $t$  denote the taxable year and  $\lambda_{ij,t-1}$  the losses brought forward into the period, and one can rewrite the taxable income and the loss carry forward of current period as

$$\pi_{ij,t}^{SA} = \max(0, (\pi_{ij,t} + \lambda_{ij,t-1}^{SA})) \text{ and } \lambda_{ij,t}^{SA} = \min(0, (\pi_{ij,t} + \lambda_{ij,t-1}^{SA})) \quad (1)$$

which can then be aggregated to the total taxable profit under separate accounting

$$\Pi_{j,t}^{SA} = \sum_{i=1}^{Njt} \pi_{ij,t}^{SA}$$

Under a unitary taxation approach, losses in individual countries will be immediately offset against profits elsewhere, and losses will only be carried forward at the corporate group level. Hence the profit and the loss carry forward will be

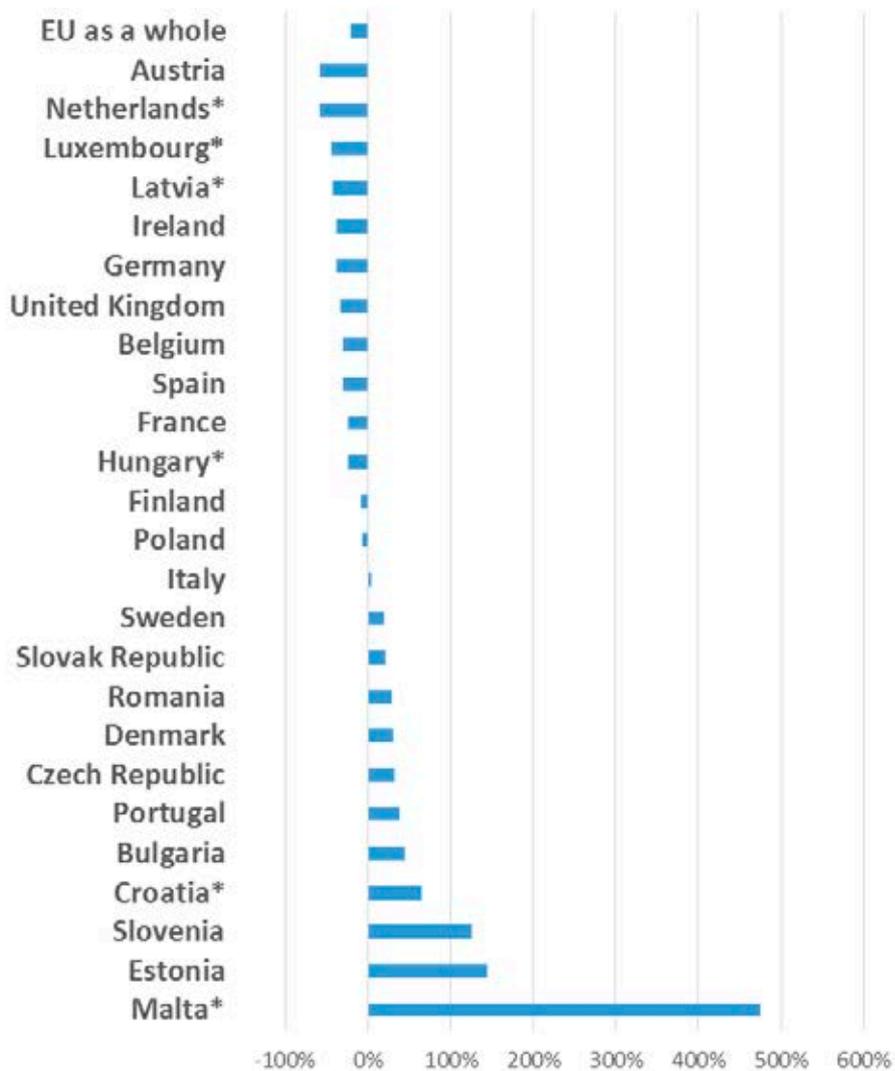
$$\Pi_{j,t}^{UT} = \max(0, (\Pi_{j,t}^{UT} + \Lambda_{j,t-1}^{UT})) \text{ and } \Lambda_{j,t}^{UT} = \min(0, (\Pi_{j,t-1} + \Lambda_{j,t-1}^{UT})) \quad (2)$$

To simulate the tax base effect of a move to unitary taxation with formula apportionment we need information about the tax base under separate accounting ( $\Pi_{j,t}^{SA}$ ), the tax base under unitary taxation ( $\Pi_{j,t}^{UT}$ ), and the apportionment factors ( $\theta_{ijx}$ ). The simplest way to measure the tax base is to use profit and loss before tax (PLBT) as reported in the accounts. In order to account for the possibility of domestic loss consolidation and loss carry forwards, we aggregate PLBT at the country-firm level and carry the losses forward to be set off against future profits as in equation (1). Similarly we aggregate PLBT at the firm level and carry remaining losses forward as in equation (2).

The results of simulating this loss consolidation using our data for the firms located in the EU are presented in Figure 2 (and in a simplified way in the associated Map 2 in the Appendix). Overall, the simulation results suggest that the sum of positive profits would decrease by 21% as a consequence of the loss consolidation (according to our sample for the EU as a whole from a total of almost 1,000 billion euro to less than 800 billion euro). This is higher than some recent results. For example, Cobham & Loretz (2014) find that international loss consolidation facilitated by a global switch to unitary taxation would reduce the overall tax base by around 12%. As is clear from Figure 2, there is a substantial heterogeneity among the countries, which is in line with Cobham & Loretz (2014). The simulation results enable a simple comparison of allowing and disallowing loss offsetting between the EU member states. For some countries, including Austria, the Netherlands and Luxembourg, the estimations suggest that the decrease in the corporate tax base due to the loss consolidation would be in the region of 50%. On the other hand, some smaller countries such as Malta, Estonia and Slovenia exhibit increased tax bases due to loss consolidation.

Overall, on the basis of the presented estimates, we conclude that significant reductions in corporate tax bases for the EU as a whole would likely result from loss consolidation. If this policy step was introduced on its own, it seems highly unlikely that there would be substantial benefits for governments, businesses or other stakeholders (such as companies having lower compliance costs and lower risks of double taxation, or other potential benefits that we do not explicitly consider here) as compared with these estimated costs in terms of tax revenue.

**Figure 2 Baseline results for the loss consolidation - percentage change relative to sum of positive profits**



Source: Authors on the basis of the Orbis data.

Note: There are only a limited number of firms available in the data and we highlighted those with less than 50 firms with an asterisk. The extreme case of Malta is one example of such an estimate based on a limited number of firms available (see also Figure 3, 4, and 5 below). The at times contradictory results presented in this paper are somewhat consistent with other existing research that suggests that Malta is both a secrecy jurisdiction (Cobham, Janský, & Meinzer, 2015) and a country vulnerable to international corporate tax avoidance (Cobham & Janský, 2017a).

With consolidated losses, following an appropriately modified version of Cobham & Loretz (2014) as the baseline model, we provide estimations of a number of specific policy scenarios. In the main estimation results we compare the country-level results against the baseline results above and the simulated tax bases following the loss consolidation and underlying Figure 2.

Our main focus is on various apportionment formulas, a choice of which has been found to be of vital importance already by Devereux & Loretz (2008). Specifically, we explore the effects of varying the longstanding proposal for formulary apportionment under the CCCTB which combines weighted indicators of sales, tangible assets and employment; by considering the Canadian formula (weighted indicators of turnover and payroll, called Canada below according to the formulary apportionment applied in Canada); and sales-only (in theory, it would be interesting to differentiate sales by destination and by origin, but in practice we are left with no such differentiation in the data and use the information on total turnover instead).

The comparison of these three scenarios is based on the data set described above, where observations with missing or zero or negative profits or factors for the specific formula in question are dropped. In the baseline results we do not apply any size thresholds for the multinational groups (thus implicitly assuming that the proposal is either mandatory for all multinational firms or that all the multinational firms voluntarily opt in), although we briefly explore the effects of imposing thresholds that an entity **is included in CCCTB if it has annual global turnover of €40 million or €750 million or more.**<sup>4</sup> In the baseline results, we simulate the CCCTB only within the EU, given the current proposal and the characteristics of our EU-focused data, but we explore the effects of considering apportionment globally. A membership in corporate group is defined through a larger ownership stake than 50%, a definition applied in the data preparation. We allow for loss offsetting between member states and the estimated simulations are presented as proportional changes in tax bases relative to the tax bases after loss offsetting, i.e. underlying Figure 2.

We now compare three scenarios and the three scenarios differ by apportionment formula only: CCCTB (one-third tangible assets, one-third turnover, one-sixth payroll, one-sixth number of employees), Canada (one half turnover, one half payroll) and Turnover. We start by investigating what we call the CCCTB scenario, in which the apportionment formula follows the current European Commission proposal. The results of simulating this using our data for the firms located in the EU are presented in Figure 3 (and in a simplified way in the associated Map 2 in the Appendix). The graph shows percentage change under unitary taxation relative to sum of firm-level loss-consolidated positive profits.

According to the estimates presented in Figure 3, a diverse group of smaller countries (including the Czech Republic, Portugal and Sweden) might expect their corporate tax bases to shrink by around one third, with the tax base of Malta, Slovenia and Estonia declining more than half in terms of their loss-consolidated tax base due to formulary apportionment in the CCCTB scenario. With the exception of France, for which we estimate the CCCTB formulary apportionment to have a negligible effect, all the other Western European big countries seem to gain. In comparison with the loss-consolidated tax base, the tax bases of Germany, Spain, United Kingdom and Italy would all increase by around 10-20% if the tax bases were apportioned according to the three-part CCCTB formula. Although these percentage gains are not that high, the fact that these are all big economies means that in terms of number of countries most EU member states might expect their tax bases to decline following this apportionment.

Partly for the sake of completeness and partly for the complex picture it provides, we also include in Figure 4 the percentage change under unitary taxation relative to sum of positive profits (i.e. the status quo and before any loss consolidation, in order to see the pure realignment effect, independent of the impact of loss consolidation). Figure 4 highlights that aligning profits (and hence tax base) with the location of real economic activity, as the CCCTB envisages, would result in a very substantial redistribution of tax base among member states – at the expense of those members positioned aggressively as profit-shifting hubs (such as Luxembourg, the Netherlands and Ireland), and to the benefit of others. For both Figure 3 and Figure 4 we provide also the estimates in thousand euros in Table A1 in the Appendix.

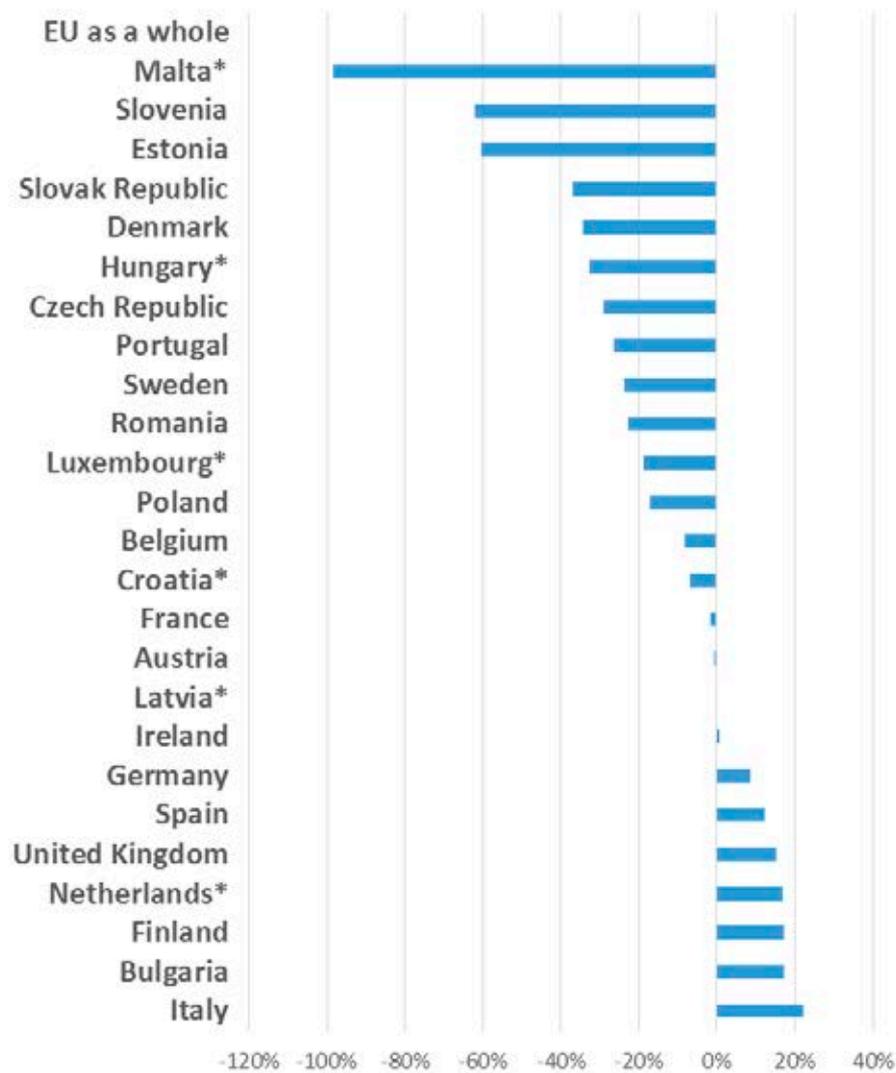
Table 5 and Figure 5 show results for the three apportionment formulas (CCCTB, Canada, Turnover), with country-level estimates of percentage change under unitary taxation relative to sum of firm-level

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<sup>4</sup> In a preliminary analysis we explored the effects of imposing thresholds that an entity is included in CCCTB if it has annual global (implying the EU-wide total given our EU-focused data and therefore implicitly making the important assumption that there are no other activities of the multinational groups in question) **turnover of €40 million or €750 million or more.** The sample size decreased substantially, but most the characteristics remain similar. For example, the observations with available information for profit decreased from 174,619 observations without threshold by around a third to 110,783 observations with the turnover threshold of €40 million and by around another third to 64,008 observations with the turnover threshold of €750 million.

loss-consolidated positive profits. For some countries the estimates by the three various formulas point in the same direction of either shrinking or expanding their corporate tax bases and often the estimates are of quite similar magnitude as in the case of Italy or Estonia. For some other countries there are notable differences between the apportionment formulas. Germany's corporate tax base would increase by 9%, 17% and 42% depending on whether the profits were apportioned according to the CCCTB, Canada or Turnover respectively. According to the estimates, Slovenia, the Czech Republic and Sweden should expect their corporate tax base to decrease according to the CCCTB and Canada apportionment, but to increase if the profits were apportioned on the basis of turnover. Of course, these kind of distributional differences, discussed in previous studies such as Devereux & Loretz (2008), might make the choice of the apportionment formula a political question.

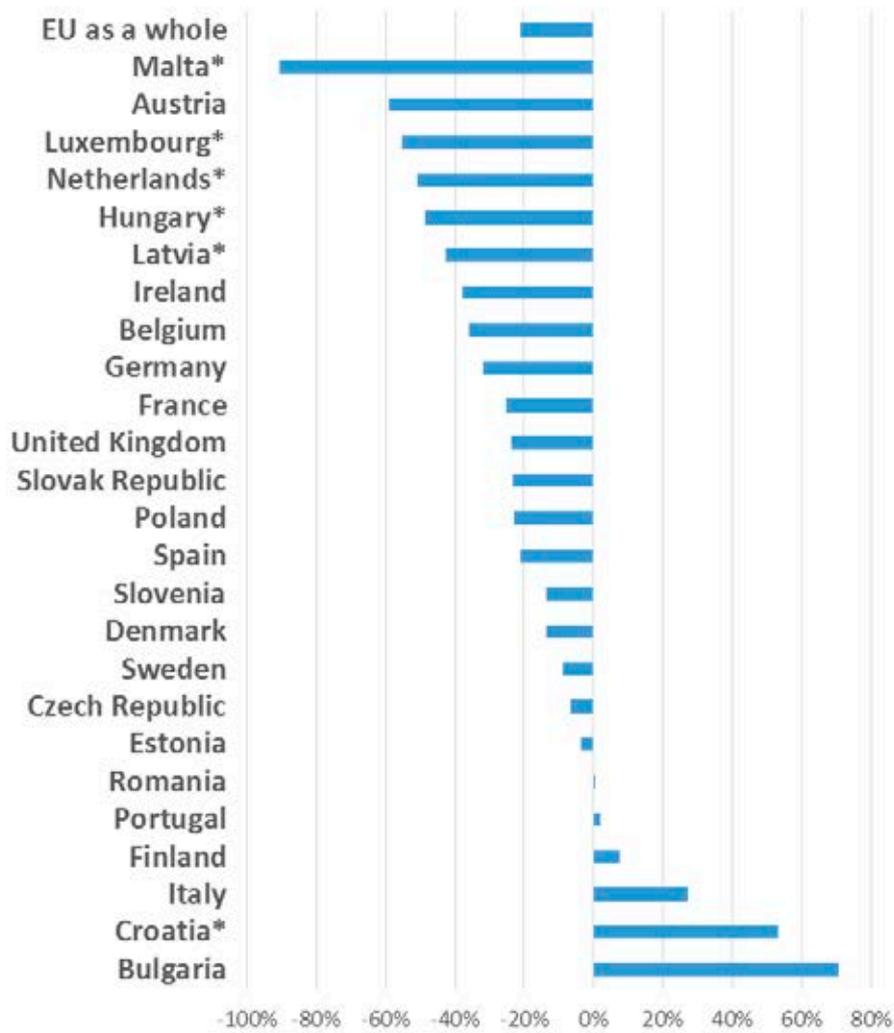
**Figure 3. Baseline results for the so-called CCCTB apportionment formula – percentage change under unitary taxation relative to sum of firm-level loss-consolidated positive profits**



Source: Authors on the basis of the Orbis data.

Note: There are only a limited number of firms available in the data and we highlighted those with less than 50 firms with an asterisk.

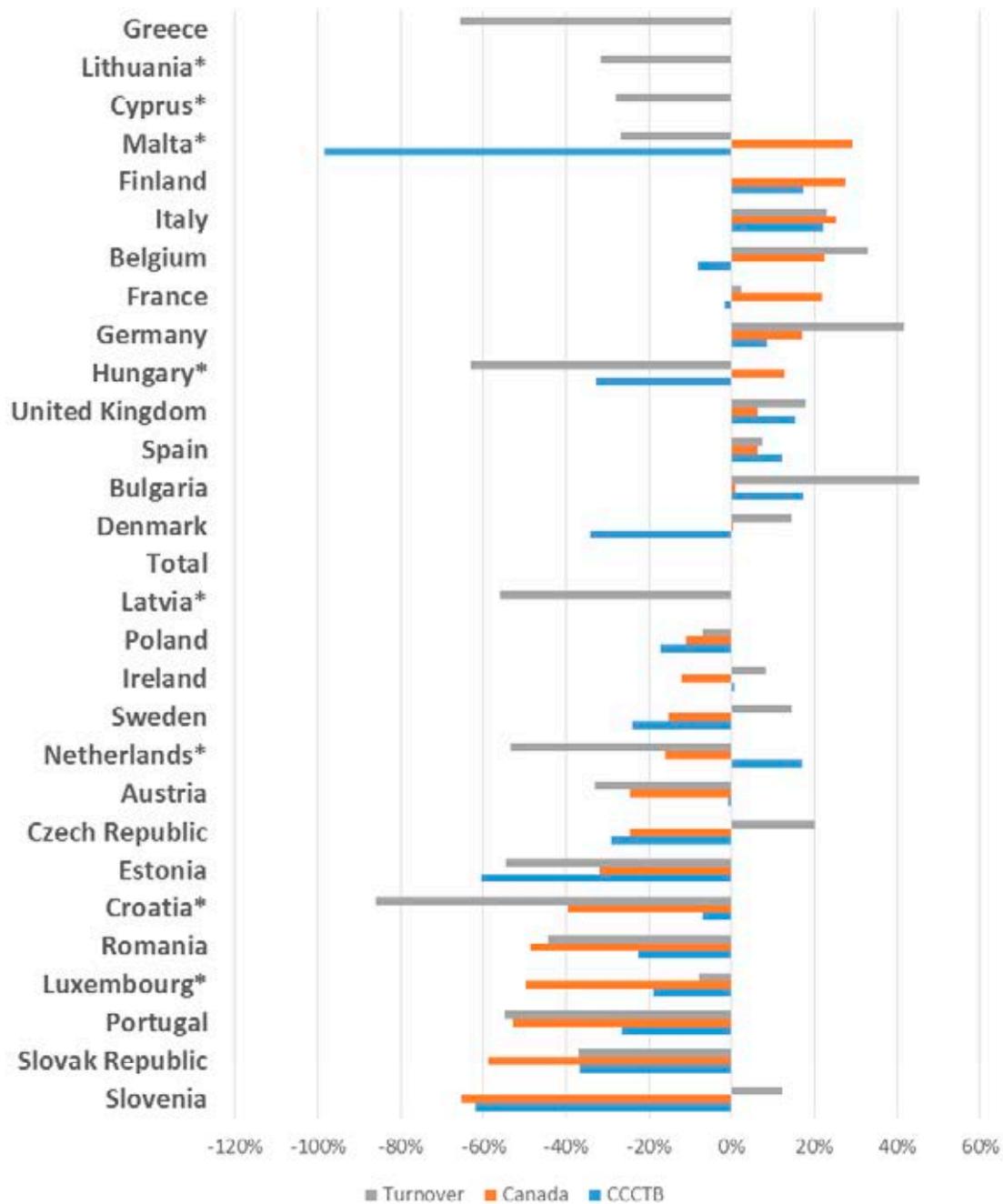
**Figure 4. Baseline results for the so-called CCCTB apportionment formula – percentage change under unitary taxation relative to sum of positive profits**



Source: Authors on the basis of the Orbis data.

Note: There are only a limited number of firms available in the data and we highlighted those with less than 50 firms with an asterisk.

Figure 5. Baseline results for three apportionment formula (CCCTB, Canada, Turnover) – percentage change under unitary taxation relative to sum of firm-level loss-consolidated positive profits



Source: Authors on the basis of the Orbis data.

Note: For Cyprus, Lithuania and Greece, there are data and therefore estimates only for turnover. For other countries, there are only a limited number of firms available in the data and we highlighted those with less than 50 firms with an asterisk.

Table 5. Baseline results for three apportionment formula (CCCTB, Canada, Turnover) – percentage change under unitary taxation relative to sum of firm-level loss-consolidated positive profits

	CCCTB	Canada	Turnover
Austria	-1%	-25%	-33%
Belgium	-8%	22%	33%
Bulgaria	17%	1%	45%
Croatia*	-7%	-39%	-86%
Cyprus*	-	-	-28%
Czech Republic	-29%	-25%	20%
Denmark	-34%	0%	14%
Estonia	-61%	-32%	-55%
Finland	17%	28%	0%
France	-2%	22%	2%
Germany	9%	17%	42%
Greece	-	-	-66%
Hungary*	-33%	13%	-63%
Ireland	1%	-12%	8%
Italy	22%	25%	23%
Latvia*	0%	0%	-56%
Lithuania*	-	-	-32%
Luxembourg*	-19%	-50%	-8%
Malta*	-98%	29%	-27%
Netherlands*	17%	-16%	-53%
Poland	-17%	-11%	-7%
Portugal	-27%	-53%	-55%
Romania	-23%	-49%	-44%
Slovak Republic	-37%	-59%	-37%
Slovenia	-62%	-65%	12%
Spain	12%	6%	8%
Sweden	-24%	-15%	14%
United Kingdom	15%	6%	18%

Source: Authors on the basis of the Orbis data.

Notes: For Cyprus, Lithuania and Greece, there are data and therefore estimates only for turnover. There are only a limited number of firms available in the data and we highlighted those with less than 50 firms with an asterisk.

The above results are based on the Orbis data with firms located only in the EU and therefore are not suitable for studying the application of formulary apportionment globally. For this two other datasets are more suitable and we use them here to complement the main dataset in a partial analysis that warrants further research. One is the Global Orbis dataset of firms located worldwide used by Cobham & Loretz (2014), and the other is a dataset from the Bureau of Economic Analysis on activities of US multinationals used by Cobham & Janský (2017). The datasets are described in detail in the referenced papers. We present the estimates based on the two data sources in one table for clarity, although there are a number of differences between the two datasets such as different coverage (an incomplete sample of global multinationals versus all US-headquartered multinationals), years (a period of 2003-2011 versus 2012) and level of detail (firm-level data versus aggregated at the country level).

We use these two additional data sets to examine the role of misalignment jurisdictions in the EU and related implications for the application of unitary taxation globally. Cobham & Janský (2017) identified six major misalignment jurisdictions, capturing a tax base disproportionate to their economic activity. Three of them are EU member states: Ireland, Luxembourg and the Netherlands. Table 5 looks at the EU countries available in the two data sets (17 in the first one, 26 in the second one, out of the total of 28 member states with those smaller ones having no data available) and distinguishes between the three EU misalignment jurisdictions and the other EU countries. Specifically, Table 6 shows the shares of economic activity indicators in totals (of all the US multinationals and the whole global sample of Orbis, respectively), together with average effective tax rates (weighted and unweighted ratios of profit and loss before taxation and corporate taxes, respectively) and ratio of profit and CCCTB shares (all except this last one presented in %). Using both datasets, we observe that the profit and loss before taxes reported in these three misalignment countries is usually substantially higher than the various indicators of economic activity. While the ratio of profit and CCCTB shares is much higher for these three countries than for the remaining EU countries, the three countries exhibit very low average **effective tax rates of 1.9 and 1.6% in comparison with the other countries' 26.8 and 13.4%** according to the two data sources, respectively. This is suggestive of profit-shifting into the three countries, likely both from other EU members as well as from other countries, including the US.

The estimates presented in Table 6 are also of relevance for the discussion of the application of unitary taxation globally. The ratio of profit to the CCCTB measure of 0.66 for the other EU members on the basis of the Bureau of Economic Analysis data set suggests that there is much less profit reported in these countries than would correspond to economic activity located there according to the available indicators. At least some of it is due to the three EU misalignment jurisdictions, but there are other important misalignment jurisdictions outside the EU such as Switzerland, Singapore and Bermuda.

These two additional datasets warrant further research, and we are thus cautious in making conclusions. Still, it seems likely that there is a risk that the implementation of EU-only unitary taxation might not be the optimal approach. It could lock in any current EU member losses to the rest of the world; or it could contribute to continuing the current exploitation of the rest of the world by some other member states, such as the three misalignment jurisdictions of Ireland, Luxembourg and Netherlands.

Just as loss consolidation as a single step is likely to impose large revenue losses on the EU as a whole, there is also a clear possibility that combining this with an EU-only apportionment approach could eliminate the incentives to profit-shift within the EU, but exacerbate the incentives and opportunity to profit-shift out of the EU. This suggests a need to agree on a fully global application of an EU unitary approach (e.g. through full-inclusion CFC rules), either in a single step or a scheduled stage to follow initial application within the EU only.

Finally, comparison of the Bureau of Economic Analysis and Global Orbis results confirm a major shortcoming of the latter. The dominance of EU entities makes the Orbis dataset oblivious to the great majority of aggressive profit-shifting by US multinationals – and neither dataset provides much useful coverage of other countries. Further research should address this by taking advantage of the data now being provided to tax authorities under the new country-by-country reporting standard, which offers the only possibility for comprehensive analysis of multinationals operating in the EU and their worldwide profit-shifting. Subsequent research should also focus on simulations of some specific characteristics or modifications of the current European Commission proposal for which there are not suitable data, such as the research and development super-deduction, the so-called ‘allowance for growth and investment’, and the interest limitation rule. Future studies should also consider excluding the United Kingdom, which seems poised to leave the European Union before any form of the CCCTB might be implemented.

Table 6. Shares of economic activity indicators in totals, average tax rates and ratio of profit and CCCTB shares (all except the last column in percentages)

Group of countries	Data set	Profit and loss before taxes	Tangible assets	Turnover	Number of employees	Payroll	CCCTB measure	Average tax rate	Profit share/CCCTB share
17 EU members	BEA US MNEs	21.7	8.0	13.4	10.2	11.0	10.7	21.8	2.03
Ireland, Luxembourg and Netherlands	BEA US MNEs	16.0	1.8	3.5	0.9	1.1	2.1	1.9	7.62
Other 14 EU members	BEA US MNEs	5.7	6.2	9.9	9.3	9.9	8.6	26.8	0.66
26 EU members	Global Orbis	92.7	87.7	92.2	83.1	95.6	89.8	10.2	1.03
Ireland, Luxembourg and Netherlands	Global Orbis	4.6	1.4	3.0	0.8	1.3	1.8	1.6	2.57
Other 23 EU members	Global Orbis	88.1	86.3	89.2	82.3	94.3	87.9	13.4	1.00

Source: Authors on the basis of the Orbis and the Bureau of Economic Analysis data from Cobham & Loretz (2014) and from Cobham & Janský (2017), respectively.

Notes: The Global Orbis data is pooled over the years 2003-2011 prepared in a way described in the original paper of Cobham & Loretz (2014). The Orbis-based average tax rates are weighted ratios of profit and loss before taxation and taxes. The Bureau of Economic Analysis data are for US-headquartered multinationals in 2012 (BEA US MNEs) prepared in a way described in the original paper of Cobham & Janský (2017); the relevant average tax rates are unweighted and estimated as ratios of profit and loss before taxation and taxes.

## 4. CONCLUSION

The European Commission's proposed CCCTB has been much discussed and analysed over the last decade and more. The explicit unitary treatment of multinationals had been considered somewhat controversial, despite the economic logic of the approach and its successful use for corporate tax *within* a range of countries from Switzerland to the United States. Now, however, there is a growing **international consensus on the inappropriateness of the alternative: the arm's length principle upon which OECD tax rules are based**. European policymakers are actively considering the introduction of the CCCTB, or an alternative without full consolidation (the CCTB).

This paper presents a **new analysis of the likely impact on EU member states' multinational corporate tax bases**, for a range of scenarios. Overall, we find that aligning profits (and hence tax base) with the location of real economic activity, as the CCCTB envisages, would result in a very substantial redistribution of tax base among member states – at the expense of those members positioned aggressively as profit-shifting hubs. Adopting a formula for profit apportionment based on sales and employment seems preferable for various reasons. However, allowing the cross-border transfer of losses could lead to a potentially dramatic reduction in tax base across the EU as a whole – especially if this is done separately from the introduction of a unitary approach, or if consolidation is not envisaged at the global level but rather at EU level (since the latter would leave profit-shifting out of the EU untouched). We conclude that a timetable to achieve the full CCCTB should be agreed, and the approach recast as a worldwide one by incorporating full-inclusion CFC rules (and ensuring that adoption of the Anti Tax Avoidance Directive does not conflict with this).

We conclude that, on the basis of the presented estimates, significant declines in corporate tax bases across the EU would result from loss consolidation, likely with no correspondingly large benefit if there was no switch to unitary taxation and formula apportionment at same time. The revenue impact of loss consolidation, if introduced as a separate step, would be dramatic and immediate; any possible gains would be gradual and quite likely small in comparison.

We also conclude that locking in current EU member losses to the rest of the world – or expecting to continue current exploitation of the rest of the world by some other member states such as the three misalignment jurisdictions of Ireland, Luxembourg and the Netherlands – does not make good sense and there is a need to agree a timetable at outset for a fully global application of unitary approach (e.g. through full-inclusion CFC rules).

Our findings also add further weight to previous conclusions, that none of the existing public datasets provide a suitable basis to assess the proposal – and that the Orbis dataset in particular is **systematically likely to understate both the extent of multinationals' profit-shifting**, and of the redistributive potential of unitary approaches. Bureau of Economic Analysis data on US multinationals suggests potential revenue gains to the EU as a whole which are far in excess of those seen in the Orbis findings here.

We conclude that, before committing to global application of unitary taxation, the European Commission should prepare a study on the basis of country-by-country data (possibly those collected under the OECD framework) to eliminate all uncertainty about the data quality underlying static findings, including those presented above. This is too big of a decision to make on dataset with the systematic weaknesses of Orbis or, indeed, the Bureau of Economic Analysis data and other similar datasets, and thus calls for the need for better and publicly available firm-level datasets. With OECD country-by-country reporting currently available privately to EU tax authorities, however, an immediate priority should be to collate this data and provide precise assessments of the range of policy scenarios. Committing to such a major policy reform without using this available data resource is unnecessary, and would be gravely irresponsible.

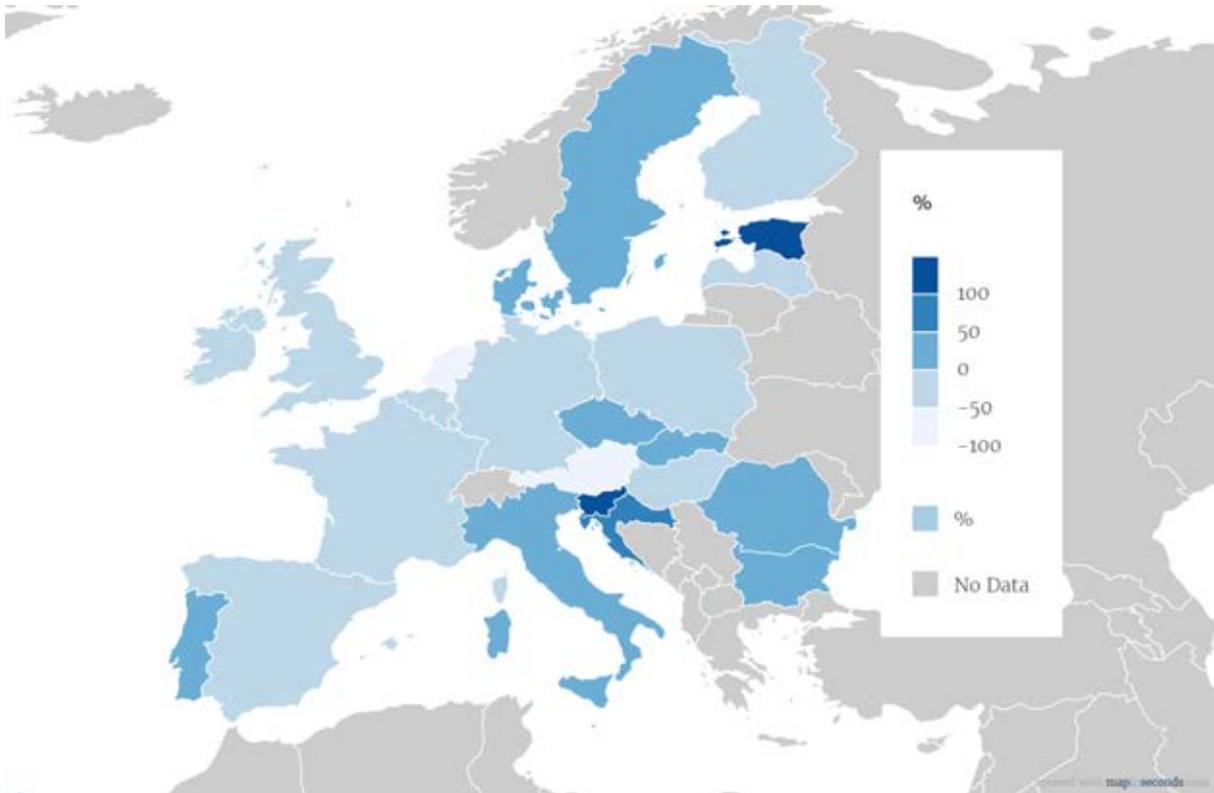
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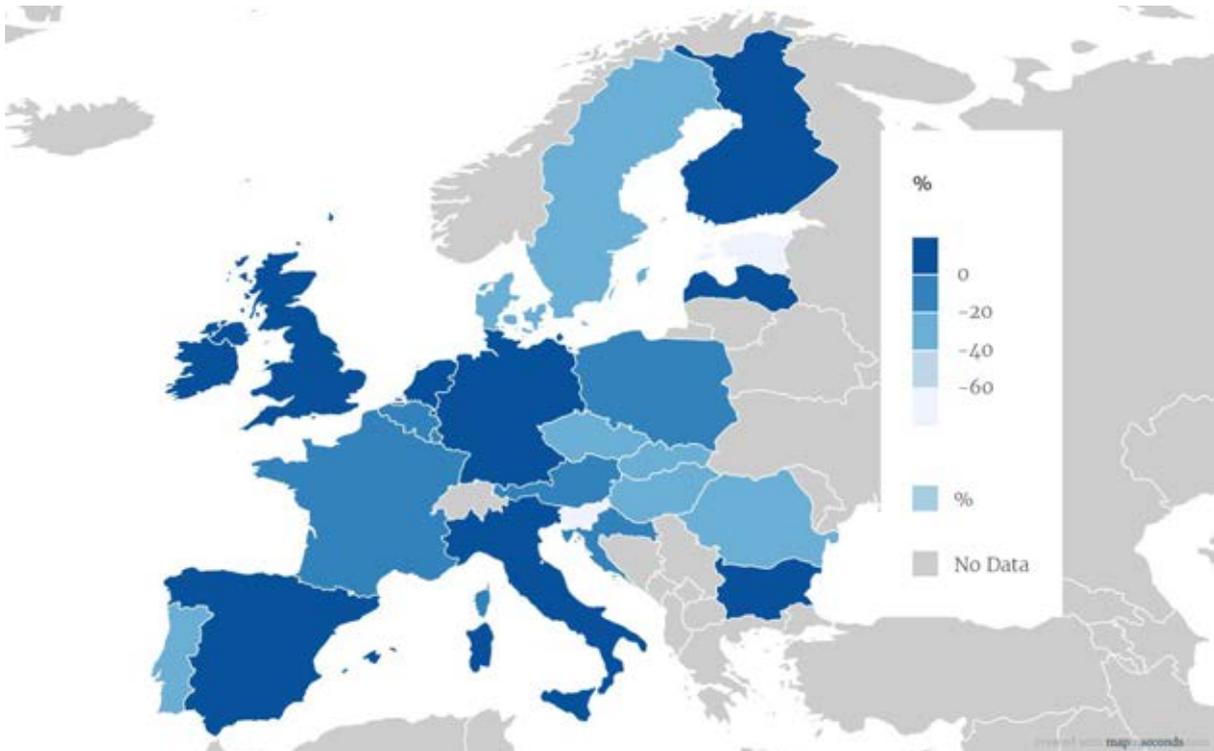
## 6. APPENDIX

Map 1. Baseline results for the loss consolidation - % change relative to sum of positive profits



Source: Authors on the basis of the Orbis data (and using <http://mapinseconds.com>).

Map 2. Baseline results for the CCCTB apportionment formula - percentage change under unitary taxation relative to sum of firm-level loss-consolidated positive profits



Source: Authors on the basis of the Orbis data (and using <http://mapinseconds.com>).

Table A1. Baseline results for the so-called CCCTB apportionment formula (in thousand euro)

	Sum profit and loss before taxes - positive only	Relative to sum of firm-level loss-consolidated positive profits (similar to Figure 3)	Relative to sum of positive profits (similar to Figure 4)
Austria	35 446 369	-114 482	-20 886 948
Belgium	123 677 531	-7 025 410	-44 421 602
Bulgaria	7 955 434	2 008 272	5 618 757
Croatia*	2 569 514	-297 183	1 370 256
Czech Republic	24 907 595	-9 571 339	-1 625 533
Denmark	8 237 988	-3 689 993	-1 130 866
Estonia	558 314	-825 710	-20 292
Finland	15 578 378	2 472 643	1 176 177
France	80 610 736	-1 069 520	-20 202 768
Germany	171 197 602	9 282 333	-54 695 518
Hungary*	1 779 986	-445 214	-867 094
Ireland	20 942 364	69 640	-7 882 295
Italy	98 053 099	22 519 818	26 562 801
Latvia*	41 203	-	-17 553
Luxembourg*	20 802 171	-2 175 666	-11 496 528
Malta*	656 588	-3 709 761	-593 719
Netherlands*	30 465 899	2 183 182	-15 460 352
Poland	27 731 841	-4 403 116	-6 350 034
Portugal	19 441 274	-7 164 211	412 047
Romania	20 468 408	-6 019 950	64 791
Slovak Republic	12 702 944	-5 686 006	-2 943 583
Slovenia	2 637 241	-3 697 519	-364 686
Spain	115 164 616	10 001 094	-24 176 887
Sweden	21 928 025	-6 261 405	-1 955 822
United Kingdom	134 215 763	13 619 510	-31 807 046
Total	997 770 885	-	-211 694 300

Source: Authors on the basis of the Orbis data.

Note: There are only a limited number of firms available in the data and we highlighted those with less than 50 firms with an asterisk.