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The Delineation and Apportionment
of an EU Consolidated Tax Base
for Multi-jurisdictional Corporate Income
Taxation: a Review of Issues and Options

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TAXATION PAPERS

THE DELINEATION AND APPORTIONMENT OF AN EU CONSOLIDATED TAX BASE FOR MULTI-JURISDICTIONAL CORPORATE INCOME TAXATION: A REVIEW OF ISSUES AND OPTIONS

by

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Working paper No 9 – October 2006

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Summary

The Commission Services study on "Company Taxation in the Internal Market" [SEC(2001)1681] and the Communications COM(2001)582 and COM(2003)726 on EU company taxation presented a long-term strategy to tackle the corporate income tax obstacles in the Internal Market by providing multi-jurisdictional companies with a consolidated tax base (CTB) for their EU-wide activities for corporate taxation purposes. This comprehensive approach relies on a number of crucial steps such as delineating the CTB and choosing the mechanism for apportioning the multinationals' tax bases between the relevant Member States, so that they can then apply the national corporation tax rate to their respective shares. This work systematically addresses some of the fundamental questions that arise when considering the design of a "consolidation + apportionment" system for sharing multinationals' consolidated profits between EU Member States (MS).

To delineate the CTB to be shared between jurisdictions (*the apportionable CTB*), one must consider the options for a number of key issues: among them, the precise definition of the consolidated group (either from a legal or an economic perspective), the share of lower-tier affiliates' profits that will be accrued to the group's CTB, the distinction between apportionable and non-apportionable elements of the tax base (depending on whether or not they can be identified with a particular location), the territorial scope of the profits subjected to apportionment (the 'water's edge' principle), etc. The different options for each of these issues are analysed and appraised in the paper.

The choice between the different *apportioning mechanisms* to distribute the CTB should be based on traditional tax principles, which are stated in the paper as regards apportionment: *equity* (which might be defined according to "equal earned income", "equal capacity to earn income" or the "benefit principle" approaches to inter-nation equity) and *efficiency* criteria (which in turn rely on neutrality, enforceability, simplicity and cost-effectiveness). The various apportioning alternatives considered are systematically reviewed in the light of these tax principles.

There are several alternatives to consider in choosing the specific apportioning method to be used for distributing the CTBs. Multinational firms' tax bases could be shared out at macro level (i.e. using factors aggregated at Member State level) or at micro level (i.e. using factors calculated at individual company level). At micro level, the paper analyses two alternatives: a traditional formula-based system and a value-added key.

Macro-apportionment would imply dividing the CTB of *any* EU multinational group according to factors such as the aggregate national value added or GDP either of all MS or of those MS where each group operates. This system could produce inter-jurisdictional equity on aggregate, but it most likely implies decoupling the tax liability of a specific firm to a member country from its real economic activity in that country, thus it does not comply with minimum

taxpayer equity standards. On the other hand it is simple, efficient (avoids factor- and profit-shifting incentives) and cost-effective.

Traditional formulary apportionment (FA) is the best known method for sharing multi-jurisdictional firms' profits between different jurisdictions, as it is used in several countries, the most developed systems being those in the US and Canada. The FA method tries to approximate the contribution of each jurisdiction to the companies' taxable profits by using a predetermined formula whose elements represent the factors deemed to generate income (usually *payroll*, *capital* and/or *sales by destination*). The choice, valuation and weighting of factors and the possible use of different formulae for different industries are the main issues that would need to be defined for a potential EU FA system. The FA methodology complies with the "equal capacity to earn income" approach to an equitable inter-nation apportionment. However using apportionment factors that are specific to particular taxpayers might affect incentives regarding the location of the economic activities that comprise the factors and prompt tax competition between national governments to attract businesses' activities into their territories. Although FA's simplicity in terms of data collection, and especially its help in reducing transfer pricing costs for business and administrations, count in its favour, it could also be complex in its practical application (e.g. using different formulae for different economic sectors, valuing intangibles, etc).

There are no current experiences shedding light on the possibility of using a *value added key* (VA) as an apportioning factor. The VA-based apportioning mechanism would attribute to a tax jurisdiction a fraction of the total income of a multi-jurisdictional group equal to the jurisdiction's share in VA at group level. In the paper it is argued that, to be conceptually plausible for apportionment purposes, the concept of VA used should be origin-based and income-type (rather than the destination-based and consumption-type definition currently used for EU VAT) and it should be measured by subtraction, so as to avoid the need to calculate profits explicitly by location. Using the VA key as the apportioning mechanism would have the appeal of complying, at least partially, with an "equal earned income" approach to equity in apportionment (since VA relies on profits). Also, the VA concept is very familiar to taxpayers and tax administrations in the EU, and the adjustments needed to move from the current VAT base to an apportioning VA factor are not insurmountable. VA would also avoid using different formulae for different industries, because it is a consistent concept for all economic sectors. It could also better complement less refined definitions of the group (the "legal" definition) and of the CTB (incorporating both business and non-business income), because it would (partially) solve the 'misallocation' concerns relating to those definitions. However it has two important drawbacks: first, because of the profit-shifting incentives reintroduced through the apportionment formula (although these are much smaller than in current arm's length pricing practices) it reintroduces the need to value all intra-EU intra-group transactions and, secondly, it places a heavy tax burden on labour, the main component of VA.

Detailed analysis of the alternative apportioning mechanisms from the point of view of the tax principles outlined has shown that there are trade-offs between them and thus the choice of an 'optimal' apportioning system depends heavily on the basic priorities sought from its outcome (equity, efficiency, etc).

Keywords: corporate tax reform in the EU, multinational taxation, formula apportionment

JEL Classification: H2, H3, H87

I. INTRODUCTION

The Commission Services study "*Company Taxation in the Internal Market*" [SEC(2001)1681] and the subsequent Communications "*Towards an Internal Market without Tax Obstacles: A Strategy for Providing Companies with a Consolidated Corporate Tax Base for their EU-wide Activities*" [COM(2001)582] and "*An Internal Market without Company Tax Obstacles: Achievements, Ongoing Initiatives and Remaining Challenges*" [COM(2003)726] presented a twin-track strategy to tackle corporate tax obstacles and tax-induced inefficiencies in the Internal Market. In addition to various targeted measures in the short run, the long-term, all-embracing solution would consist of providing companies with a consolidated corporate tax base for their EU-wide activities. Such a comprehensive strategy essentially means reforming the corporate taxation systems for EU multinational groups ⁽¹⁾, i.e. groups of associated companies whose members reside and operate in at least two different Member States of the EU. The proposed scheme for multinational enterprises' (MNEs) corporate income taxation in the EU hinges on a two-step "consolidation + apportionment" (C+A) procedure consisting of:

- First, taking the total income of a multi-jurisdictional group of companies and calculating the consolidated tax base (CTB) for their EU-wide activities, neutralizing intragroup transactions (national or cross-border). Two main approaches for calculating the group CTB have been envisaged: (i) the so-called Home State Taxation (HST) approach, according to which the tax rules of the country in which the group's parent company resides should be applied to calculate the whole group's CTB ⁽²⁾, and (ii) the Common Consolidated Corporate Tax Base (CCCTB) approach, according to which a completely new set of rules would be defined at EU level to calculate multi-jurisdictional firms' CTBs ⁽³⁾.
- Second, apportioning this CTB according to a predetermined rule between the different tax jurisdictions deemed to have the right to a share of it for corporate income tax purposes. Subsequently, Member States would apply their own corporate tax rates to the tax base accruing to them as a result of this process.

The reasons advanced for moving towards a C+A system relate to tackling in a comprehensive manner most of the problems that the current tax system causes, both for

⁽¹⁾ In theory the principles underlying the "consolidation + apportionment" procedure explained below could also be applied to allocating across tax jurisdictions the income of **single companies** (ie with foreign branches or permanent establishments situated in another Member State/s). For drafting simplicity this work will generally refer to multinational **groups** (ie company groups made up of associated enterprises, where each group member is a separate entity). See Hellerstein (2005) for further elaboration of the distinction between separate-entity reporting and arm's length/separate geographic accounting.

⁽²⁾ See the communication *COM (2005) 702 final* (Commission of the European Communities (2005)), in which the Commission suggests that Member States allow an HST pilot scheme for small and medium-sized enterprises operating in the Internal Market.

⁽³⁾ See the communication *COM (2006) 157 final* (Commission of the European Communities (2006)) reporting on progress to date in the design of a CCCTB.

companies and Member States, and that prevent an efficient functioning of the Internal Market:

1 – First of all, the present taxation rules impose important corporate tax obstacles on EU company groups undertaking cross-border activities:

(i) The present taxation rules for a group of related corporations acting in several tax jurisdictions are based on 'separate accounting' (SA), that is, group members in different Member States are treated as independent fiscal units. This means that their individual profits are to be calculated on an entity by entity basis and therefore all intra-group transactions have to be priced as though they had been made between independent enterprises dealing at arm's length. Trying to unbundle, by Member State, the income earned by a group of corporations engaged in integrated cross-border economic activity – as the SA system attempts to do – has proved a complex, costly and even conceptually questionable task (see Hellerstein, 2005). Notably, the system involves heavy transfer pricing obligations, which are costly both for companies to comply with and for tax administrations to monitor. The difficulties may well increase in the future as economic integration of the EU grows and as the use of information and communication technologies evolves (see Schäfer and Spengel, 2003).

(ii) The current corporate income tax system also implies that each group member's corporate tax base and tax return has to be calculated and complied with according to the corresponding Member State's national corporate taxation rules, thus increasing the tax compliance costs of EU multi-jurisdictional firms that have to learn as many tax codes as countries in which they operate.

(iii) Cross-border losses within one *company*, i.e. losses of a foreign branch or permanent establishment, may be taken into account at the level of the head office in most Member States, but only a few Member States provide for some form of cross-border setting-off of losses within a *group of companies*, i.e. allowing relief for the losses of a foreign company belonging to the same group ⁽⁴⁾. On the contrary, most Member States allow for some form of *domestic* relief of losses within a group of companies in the same country ⁽⁵⁾.

This situation (briefly sketched in the above points) clearly renders the firms' decision between domestic or cross-border investments non-neutral to tax conditions and therefore it may create tax-induced distortions to the allocation of investment by EU firms across the Internal Market. All in all, this tax scenario can be considered to deter companies from exploiting all the potential advantages of the Internal Market. Furthermore, small and medium-sized enterprises are particularly hit by these tax obstacles linked to cross-border operations.

⁽⁴⁾ Austria, Italy, Denmark and France have some forms of cross-border loss compensation systems for group taxation, which normally differ from the ones applied domestically.

⁽⁵⁾ Belgium, Czech Republic, Greece, Lithuania, Hungary and Slovakia do *not* provide any kind of domestic group relief.

2 – Secondly, it is well known that the SA methodology gives MNEs scope for strategic tax planning and tax avoidance, to the detriment of collection of public revenues by Member States. In particular, the current arm's length-based system for calculation of corporate tax bases within each Member State provides possibilities for multinational groups to shift taxable profits between the different EU countries in which they operate (ie, by strategically manipulating the internal transfer prices of their intra-group transactions or by altering the financial structure of the group members in order to minimise the groups' overall tax liabilities). This causes tax-induced distortions to the international allocation of corporate tax bases across EU countries and is an additional reason for tax competition among national governments (further than the traditional tax competition for real investment), as identified by recent literature ⁽⁶⁾, ⁽⁷⁾. Fears that such tax competition process may result in an inefficiently low level of corporate taxation come along these facts.

In contrast, an EU CTB would address many of the tax obstacles imposed by the SA methodology and could contribute to improving the functioning of the Internal Market. In particular, the C+A method referred to above would: (i) reduce compliance costs for companies, as they would not have to deal with many (up to 25) different national tax systems; (ii) allow, in general, full and automatic cross-border offsetting of losses across all group's members (ie, either with vertical or horizontal relationships); (iii) simplify costly intra-EU intra-group transfer pricing obligations, as intragroup transactions are eliminated out when calculating the CTB and therefore, in principle, there would be no need to price them at arm's length any longer; (iv) eliminate the profit-shifting incentives that SA currently provides for MNEs and in consequence limit governments' incentives to compete for "shifty profits", which may result in inefficiently low corporate income tax rates; (v) reduce the risk of international juridical double taxation arising from the non-coordination between some international tax rules. Although this work does not elaborate upon the gains of moving from current SA practices to C+A, it is important not to lose sight of the purposes of the reform when considering the design of the different elements of a new potential system. The

⁽⁶⁾ By using different methods of identifying propensities to shift reported profits internationally, the empirical literature of recent years provides ample evidence of profit shifting by MNEs: Grubert and Mutti (1991), Hines and Rice (1994), Klassen and Schackelford (1998) and more recently Grubert (2003), Desai et al. (2004), Sullivan (2004), Mintz and Smart (2004) and Altshuler and Grubert (2005) have studied U.S. and/or Canadian data, finding strong evidence in support of profit shifting to low tax countries (notably to tax havens). Bartelsman and Beetsman (2003) analyse broader data and document tax-avoiding profit shifting in OECD countries, basing their estimate of profit shifting on the link between value-added per industry and the corporate tax rate. The evidence of transfer pricing in Europe is confirmed by Weichenrieder (1996), who finds that German firms have shifted profits to the low "tax zone" in Ireland. Also for European multinationals Huizinga and Laeven (2005) find the elasticity of pre-tax profits with respect to the tax rate "large enough for international profit shifting to be a serious issue for the European tax authorities". As well, by looking at the correlation between the home country tax rate of a parent and the net of tax profitability of its German subsidiary, Weichenrieder (2006) provides findings which are compatible with profit shifting behaviour in the EU.

⁽⁷⁾ Zodrow (2003) and Wilson and Wildasin (2004) summarise the theoretical framework on which tax competition hypotheses rest (i.e. the "race to the bottom" and "convergence" hypotheses). See Giannini *et al.* (2005) for a review and interpretation of the empirical evidence on tax competition.

delineation and apportionment of the CTB should be designed in such a way that it addresses and reinforces the above arguments for reform.

This paper systematically addresses some fundamental questions that arise when considering the design of a system for sharing the consolidated profits of multinational groups between Member States of the EU. The objectives of the paper are: *a)* to identify the crucial issues on which decisions would have to be taken if a new system for multinational groups' corporate income taxation were to be established in the EU; *b)* to put forward the main options that may provide an answer to each of the potential issues and *c)* to appraise the importance and practicality of each option.

By so doing, the paper provides a "state of the art" review of the huge literature on the issue and of its main implications for the EU reform under scrutiny. It should be noted that an entire theoretical corpus (listed in the references) underlies this text. In particular, a great deal of the arguments presented relies on:

- recent literature that has analysed the company tax proposals of the European Commission and the numerous design issues of any new tax code: see for instance, McLure (2002 and 2005), McLure and Weiner (2000), Mintz (2002 and 2004), Mintz and Weiner (2003), Sørensen (2002 and 2004), Devereux (2004), Giannini (2002), Weiner (2002 and 2005), Schön (2002) and Westberg (2002).
- the literature assessing the respective merits of SA and C+A as tax methodologies: Sunley (2002), Hellerstein (2005), Owens (2005), Gammie (2003), Schäfer and Spengel (2003), etc.
- the theoretical literature investigating the economic implications of formulary apportionment (either *versus* SA or for different possible models of formula apportionment), notably in terms of incidence effects, distortions of firms' decisions and tax competition between governments: see among others McLure (1980 and 1981), Gordon and Wilson (1986), Nielsen *et al.* (2001 and 2003), Wellisch (2004), Sørensen (2003), Anand and Sansing (2000), Eggert and Schjelderup (2003), Gérard (2005), Gérard and Weiner (2003), Kind *et al.* (2005).
- the literature surveying the US and Canadian systems of formulary apportionment and the lessons to be drawn from them for the EU (Hellerstein and McLure (2004a and 2004b), Mintz (2004), Wildasin (2000), Weiner (2005), etc.

The main design problems for the EU C+A system can be grouped into three central issues:

1. - What is the tax base for each taxpayer (group of companies) to which the apportioning mechanism will be applied? The different issues related to that question are discussed below under the heading "*The Delineation of the Apportionable Consolidated Tax Base*".

2. - Once the CTB of a given group of companies is delineated, to whom should it be allocated? The issues raised by this question are dealt with in the section "*The Jurisdictions Entitled to a Share of the CTB*".

3. - How should that CTB be apportioned between those tax jurisdictions? The mechanism for apportioning consolidated profits is an essential part of any comprehensive approach, perhaps the most fundamental issue. Its main design questions are therefore extensively considered in the last section "*The Apportioning Mechanism*", by examining the different alternatives with reference to a number of desirable tax principles.

It will become apparent that several aspects of these issues are closely intertwined: for example, the actual jurisdictions entitled to a share of an MNE's CTB depend on the apportioning method agreed, and the choice of an apportioning mechanism may help to decide how to define the group, etc. However, the three issues are analysed separately for the sake of clarity in the three following sections and possible links between them are highlighted where necessary.

II. THE DELINEATION OF THE APPORTIONABLE CONSOLIDATED TAX BASE

The *apportionable consolidated tax base* is the total amount of income (i.e. taxable profits) from a multi-jurisdictional group that is to be shared out between tax jurisdictions via an apportioning mechanism. Thus, the first central issue is to decide on a number of technical rules stating how to delineate those taxable profits to be shared. As we will see, we could serve the same purpose by delineating that part of the group taxable profits that should *not* accrue to the CTB for apportionment across the relevant tax jurisdictions ⁽⁸⁾.

Delineation raises a number of crucial questions:

- a. - Whose income is to be consolidated for apportionment? That is, how to determine the tax entity to which the C+A system is to be applied (the group definition issue)?
- b. - Which income of that tax entity is to be consolidated for apportionment? That is, how to distinguish which elements/parts of the group profits, by their nature or for other reasons, should accrue to, or be excluded from, the apportionable CTB?
- c. - Which locations, in terms of sources of earnings and group members' residence, fall within the scope of the income to be consolidated for apportionment? That is, what is the territorial scope of the apportionable CTB?

It should be noted that these three issues are *delineation* questions, hence concerned with *drawing a line between profits that should enter into or remain out of a*

⁽⁸⁾ Note that group profits *not* falling under the CTB could still be *taxed* outside the C+A system.

multi-jurisdictional group's CTB for apportionment across the corresponding Member States. Another crucial question, namely what is the appropriate CTB (i.e. how should it measure the MNE's taxable income, or how to define taxable profits at group level) is currently the subject of different work and analysis by Member States and Commission Services and is not addressed here ⁽⁹⁾.

The main issues and concerns that these three delineation questions raise are covered in the three following sections.

II.1. The definition of the group ⁽¹⁰⁾

As explained in the introduction, the long-term company tax reform proposed for improving the functioning of the Internal Market in fact addresses the taxation system of EU multinational groups. For the purposes of this work, we can define an EU multinational group as *a group of related companies whose members are tax residents and operate in at least two different Member States of the EU*. However, that definition still does not quite clarify what are meant to be *related companies*: that is, what kind of relations between the members would include them in the same group for taxation purposes? This question leads us to discuss in detail the appropriate definition of the *group*: the entity to be considered as a single unit for tax purposes under this system. This is one of the most fundamental questions concerning the reform, as it crucially determines the precise delineation of the *group CTB*.

For the purposes of the C+A tax project, the main approaches to defining a group are either legal or economic.

- A legal definition would combine under the consolidated group all affiliates that exceeded a certain direct or indirect ownership threshold, for example 50%, 75% or 100%.
- Otherwise the group could be defined in economic terms, following the so-called 'unitary business' doctrine, which goes beyond the ownership test. Under the concept of unitary combination, the corporate group would include all those entities which are commonly controlled *and* which are related to one another as a single economically integrated business. Therefore two conditions are to be met for an entity to be eligible for inclusion in the unitary group. First, the entity must be *controlled*, directly or indirectly,

⁽⁹⁾ Following a discussion on company taxation in the EU at the informal meeting of EU Economics and Finance Ministers in Scheveningen in September 2004, a working group of Member State experts, chaired by the European Commission, was created to work on preparing a common set of rules for calculating companies' EU-wide taxable profits on a consolidated basis. Further details can be found at http://ec.europa.eu/taxation_customs/taxation/company_tax/common_tax_base/index_en.htm

⁽¹⁰⁾ This section relies on the discussions about the definition of the consolidated group in McLure (1984, 2002 and 2005), Hellerstein and McLure (2004a and 2004b), Sørensen (2004), Weiner (2005) and Fox *et al.* (2005), among others.

by a common parent ⁽¹¹⁾. Second, the corporations making up the unitary business should also have "economic relationships" with other members of the group, because their business activities are integrated with, dependent on and/or contribute to each other. Hence, all entities in a unitary group are to be commonly controlled by a parent company (or a group of related owners), but not all controlled affiliates of that parent are necessarily included in the unitary business, since to be included, some degree of operational and/or economic interdependence between the group units has to be shown in addition. There are various ways of looking at "economic relationships" between a number of corporations, to determine if they are *related entities*. For instance, the degree of vertical integration or centralisation of management and information, the attainment of economies of scale or scope, the existence of substantial intra-group transactions of goods, services, technological data and processes, the performance of interdependent basic operating functions, such as common purchases, common legal representation, inter-company financing, etc, could be considered as evidence of the existence of a unitary business ⁽¹²⁾. All these possible criteria for defining economic interdependence show that, in fact, there is no clear-cut benchmark of a unitary business, but that it can be a rather subjective concept, and, in many cases, difficult to identify.

Each of these options, the legal and the economic definition of the consolidated group, presents advantages and disadvantages:

*** The legal approach**

- The main advantage of the legal approach is the simple and clear boundaries of the group drawn by the ownership test. This makes it the best understood, the most feasible to implement quickly, and the one that provides the taxpayer with the greatest certainty regarding the entities to be included in the combined report. However, some decisions would still have to be taken to clearly define the legal test, such as the use of direct or indirect voting shares, non-voting shares, preference shares, etc. The decision on the precise ownership threshold for consolidation would be particularly important and difficult. For example, setting a high threshold (e.g. 100%) might be seen as a means to reconcile the legal and economic tests, as highly integrated groups are more likely to be also economically interdependent. The 100% solution also eliminates the need for special provisions for minority shareholders (as examined in the next section). However, the drawback of setting a high threshold is that, the higher the threshold, the more affiliates would fall outside the taxable group – even if the parent company owned a majority of the stock of those corporations – so there would still be scope for tax planning *via* transactions with those controlled but non-consolidated companies in the new system. For example, delineating the group based on a high-percentage ownership threshold increases the potential for transfer pricing strategies seeking to move profits out of or into the taxable group: the controlled – but non-group – affiliates can be used to shift profits

⁽¹¹⁾ Control might be deemed to exist even at a lower threshold than the majority ownership percentage: for instance, effective control can result from the holding of a large minority interest. In general, control exists if the parent entity exercises some significant influence on the affiliates to reach its own objectives.

⁽¹²⁾ Concrete tests suggested to check the existence of a unitary business include a quantitative measure of the flow of goods and services between corporations, and the "three unities test" (ownership, operation and use of executive force and systems of operation).

as long as transactions between a particular group member and those controlled entities excluded from consolidation remain subject to SA and arm's length pricing. Transactions with these non-consolidated affiliates can also be used to manipulate apportioning *factors* across companies and jurisdictions for tax-reduction purposes: for example, if a *sales by destination* factor were used to share out the CTB, there would be a strong incentive to inflate the value of sales by group member affiliates to non-member affiliates situated in low-tax jurisdictions. By contrast, under a legal definition of the group that set a level of ownership as low as 50%, these sorts of strategies would no longer be feasible because, by definition, all entities outside the group would be outside group control (i.e. all non-group entities would be non-related third parties, outside the scope of transfer pricing strategies).

- Regardless of the theoretical threshold set, the simple legal ownership test for consolidation opens the door to potential abuse, as it facilitates manipulation of the corporate structure for tax minimising purposes. For example, a parent company might establish a particular holding structure by manipulating one single share simply to include or exclude a particular subsidiary from the group. So, should a legal definition of the group be adopted, some sort of anti-avoidance features ⁽¹³⁾ would have to be introduced for the group to restrict tax-motivated ownership interest planning.

*** The unitary business approach**

- The unitary business principle seems to be conceptually superior for the purposes of consolidated group taxation in the EU, as it is more coherent with the whole concept of merging the group income together and then allocating it by means of an apportioning mechanism. This coherence comes from the fact that *under conditions of strong economic integration* between a group of entities – the distinctive conditions of a unitary business – at least two circumstances occur:

a) the economies of scale or scope resulting from internal economic interconnection within the group (for instance, due to enhanced information flow, managerial efficiency, lower purchasing costs, etc.) result in higher profits to such a group than the sum of the profits obtained by its individual parts when they operate independently, and such "excess profits" cannot be assigned using SA.

b) traditional value added chains become value added networks in economically integrated business. And within such a network of intra-group relationships, the individual contribution of each entity to the group profits is often small and hard to identify on the basis of SA.

Given this state of affairs for a typical unitary business, it makes sense to consider profits as determined at the level of the whole economic entity, and then to split them out by using a rough estimate of the contribution of each entity to the group income. That is truly the underlying economic foundation for applying the two-step C+A scheme to

⁽¹³⁾ For instance, some sort of 'motive test' or, if ownership is within say 5% of the threshold, further examination of other factors, or an additional management and control test.

multi-jurisdictional group taxation. However, *if there is not much economic interdependence* between the different group units (and this might happen even when there is common ownership), then most likely there would be no excess profits due to economies of integration on the one hand and probably individual profits could even be determined separately on the other (as presumably there would not be so many intra-group transactions). Multi-jurisdictional group taxation could perhaps make do with the current SA rules. Thus, it has been argued that the calculation and apportionment of a CTB makes more sense when applied to a unitary business group, defined on the basis of real economic interrelationship of its members. In summary, the unitary business approach is backed by economic substance and justification, which the form-based legal definition of the group lacks. This is its main (and only) comparative advantage.

- The chief disadvantage of the unitary approach is its overwhelming complications in practice, as it requires first a clear definition of 'control' and then, more importantly, agreement on the criteria and tests to measure the degree of economic integration of the affiliated entities. All these issues can be highly subjective, so it is predictably difficult to reach agreement on them, and even if some agreement could be reached, any definition of a 'unitary business' could be complex for both the taxpayer and the tax authorities to cope with and it would probably create uncertainties. Also, it would be difficult to ensure uniform interpretation across the EU of any subjective term, given the different legal traditions across Member States.

- The unitary approach may also be more sensitive to transfer pricing strategies seeking to move profits out or into the taxable group. The reason is that, *for a constant ownership threshold of both approaches*, the economic group definition is more restrictive than the legal definition since it applies a second test ⁽¹⁴⁾. So some affiliates that would be 'in' under a legal option would instead fall outside the taxable group under the unitary concept. As argued earlier, these non-consolidated companies controlled by the parent(s) could be used to shift profits by manipulating the transfer prices of transactions between them and group members.

In summary, the legal approach to defining the group is fairly simple, clear cut and at the same time more prone to manipulation, whilst the economic approach, which has stronger theoretical appeal, relies on more subjective and difficult to apply measures of economic integration between the group members.

Even though the particular approach to the group definition, legal or economic, is a crucial question for the delineation of the group and the establishment of the CTB, there are other important side group issues to reflect on: for instance, whether the participation of subsidiaries in the system should be optional or compulsory; for how long any such choice should be binding (where participation is optional); how to treat subsequently

⁽¹⁴⁾ If the economic and legal definitions are based on different ownership thresholds then this argument does not necessarily apply: namely, the economic group is not necessarily more restrictive than the legal group with respect to the number of affiliates it encompasses. For example, to define the unitary business, a low-percentage ownership test can be set initially. And after the second economic test the final affiliates in the unitary group might be similar to those passing a legal test applied to the same initial set of entities but using a higher ownership threshold.

acquired entities; whether related entities based outside the EU should be included in the group definition ⁽¹⁵⁾; and to what extent the unitary business approach could also be optional (a taxpayer could elect to treat all of its entities with the required level of ownership as a single unitary business).

II.2. The distinction between apportionable and non-apportionable elements of the tax base

Regardless of the approach adopted in defining the taxable group, legal or economic, another major consideration that arises is *which income* of this tax entity is to be consolidated for apportionment. There are at least two further issues to resolve related to this concern, which are covered in the next two sections.

II.2.1 Income of less than 100%-owned affiliates

As long as the consolidated group includes affiliates owned less than 100% there is the question of whether these entities should be consolidated 100% or in proportion to their ownership ⁽¹⁶⁾. In relation to the C+A mechanism, the issue is whether the system should be applied to the entire 100% profits of such group units or only to that share of their income equal to the ownership percentage of the consolidated group in the affiliates. Obviously, if only the pro rata fractions of those affiliates' income are included in the group apportionable tax base, then those entities' factors should also be adjusted correspondingly in the apportioning mechanism.

From a theoretical point of view, in principle the pro rata shares approach probably has a stronger appeal, since only the corresponding percentages of profits/losses of the affiliates do actually belong to the group. However, that statement might be questioned: it could be argued that if there are economic interconnections between the majority-owned affiliate and the rest of the group, then that affiliate is generally more profitable than it would be if it was independent. Consequently, as the affiliate can achieve economies of scale and/or scope thanks to its economic integration with the group, 100% of its achieved excess profits should accordingly be allocated to the group. This argument implies that perhaps in theoretical terms the most accurate attribution rule would be to assign the affiliates' income "more than proportionally" to the consolidated group. The following example illustrates this argument.

⁽¹⁵⁾ This aspect is discussed later on in section II.3 on "*The territorial scope of the consolidated tax base*".

⁽¹⁶⁾ See Hellerstein and McLure (2004a) for further discussion of issues arising with the inclusion of less than 100%-owned affiliates.

Suppose that a firm is earning profits of 1000. At a certain point 60% of its capital is acquired by an economic group and due to the economies of scale and/or scope it achieves with the new intra-group interconnections, its profits go up to 1200. It seems sensible that the profits attributable to the group should be 800: 60% of 1000 for the ownership fraction (600) *plus* 100% of the 200 excess profits, since the firm obtains these profits precisely by belonging to the group – it did not earn them before being held by the group. That makes 67% (800/1200) of the affiliate's profits attributable to the group, i.e. a percentage higher than the mere proportional 60% ownership.

If that sort of rule is meant to be the benchmark, then, on theoretical grounds, the pro rata solution is as inaccurate a rule as the simple full attribution of affiliates' total income to the group. But obviously such a refined system would be so subjective and difficult to apply in practical terms that inclusion of 100% of the income of less than 100%-owned affiliates is after all not necessarily a worse solution, even in theoretical terms, than the mere pro rata approach.

From a practical standpoint, there are fundamental issues to resolve with either of the two ways of consolidating lower-tier entities into higher-tier entities to calculate the group's CTB:

(i) If only the share of profits owned by the group goes into the CTB, there is the outstanding question of how to compute the other, non-consolidated, part of the base. To compute that second part – that corresponds to the minority shareholders' profits – can be very cumbersome. For example, all *intragroup transactions* would have to be priced to calculate the fraction of the profits of each operation accruing to the minority's non-consolidated tax base. This computation would normally have to be done on costly traditional arm's length price lines, thereby negating one of the main grounds for the reform, which is full and automatic offsetting of intragroup transactions (when it was done as true consolidation and not simply compensation between profits and losses).

(ii) If all 100% of the subsidiary's profits and factors go into the apportionable CTB ⁽¹⁷⁾, the system seems in principle simpler to apply (for example, all transactions between the less than 100%-owned affiliates and any other group members would be offset, and there would be no need to price them). But some further questions arise with this approach: for instance, whether it is fair that the profits earned in a say 65%-owned subsidiary effectively may be 'accessed' by the same amount of loss offset as analogous profits earned in a 100% subsidiary elsewhere in the group. In more general terms, the question for groups with minority interests is how to ensure fair treatment of majority and minority shareholders if the tax paid by the companies they own is potentially determined by the companies' relationship with the group. So, the core issue is whether it is acceptable that group entities with minority interests are not really taxed according to their individual circumstances but after taking into account the tax situation of the majority parent and the whole group. This sort of problem already exists partly in some domestic 'consolidation' legislation and it is often dealt with, in the case of losses offset,

⁽¹⁷⁾ This is the case in the US for States company taxation, based on the argument that once a subsidiary is deemed to be part of the group then *all* its income is meant to be group's income.

by a payment from the, say, profit-making parent to the less than 100%-owned loss-making affiliate for the 'excess' part of the losses surrendered under such group relief. If the EU system for group taxation is to assign wholly the affiliates' income to the group tax base, it would probably have to provide for some sort of compensatory mechanism of this type to take into account minority interests.

To summarise, the pro rata shares approach has probably a stronger theoretical appeal, whereas the full imputation of affiliates' income is relatively less complex to apply.

II.2.2 The distinction between different types of income: business and non-business income⁽¹⁸⁾

The second question is whether *all types* of income of the group entities are to be accrued to the apportionable CTB or whether, alternatively, specific income components should be excluded on the grounds that, by their very nature, their source can be more reliably determined by means other than a formula. Excluding some components means dividing the group tax base into two parts subject to different fiscal treatment: (i) the *apportionable* CTB, to which the apportioning mechanism will be applied to distribute it among the relevant tax jurisdictions; and (ii) the *non-apportionable* tax base, which will not be allocated to the tax jurisdictions by an apportioning method, but following other rules of income attribution, depending on the case. The principled justification for such a distinction between apportionable and non-apportionable elements is that, whereas the precise geographic *source* of some components of group income may be *indeterminate* (the apportionable ones), others can be readily identified with a *particular location*. The latter would qualify as non-apportionable elements and would be allocated straightaway to that particular location, without going through the C+A process (for example, rent or capital gain from real estate property can be attributed directly to the location of the property).

The distinction between income non-connected and connected with a particular location (or non-sourceable and sourceable income respectively) has traditionally paralleled the distinction between 'business' and 'non-business' income respectively, although the correspondence is not necessarily always exact⁽¹⁹⁾. The 'business income' category includes all income arising from regular business activities, whereas 'non-business income' typically includes other categories of income such as capital gains, royalties, dividends, interest receipts and rents. Following this distinction, the delineation

⁽¹⁸⁾ This discussion draws on Hellerstein and McLure (2004a). See Weiner (2005) and Fox *et al.* (2005) among others for further discussion of the distinction between apportionable and non-apportionable elements.

⁽¹⁹⁾ For instance, one could think of business income clearly connected to a particular location (and so, in theory not subject to apportionment) and non-business income whose source might be indeterminate (and therefore its attribution plausibly eligible for apportionment). For example, a property company with rental and some investment income: the rental income (business income) is connected to the location of the buildings; instead, the investment income (non-business income) might not necessarily be linked to the buildings because of an active investment strategy and the funds might be placed in all sorts of locations.

of an *apportionable* tax base brings only business income into the consolidated system for apportionment and excludes non-business income. Non-business income is then simply assigned for taxation to a particular jurisdiction, for example the taxpayer's commercial domicile or the jurisdiction where the income-producing activity is located. So, it is worth spelling out that excluding certain items of income from the CTB of multi-jurisdictional groups does not mean exempting them from taxation, but taxing them separately, outside the C+A system.

As regards whether an EU group taxation system should distinguish between categories of income in delineating the apportionable CTB, several arguments can be put forward:

- If some categories of group income are clearly connected with only one tax jurisdiction, they could be assigned to that territory for tax purposes without further ado, instead of being consolidated and apportioned. In particular, there is a strong case for directly assigning this type of income to the relevant tax jurisdiction if one of the agreed objectives of the profits apportionment process is *to source the origin of income* for it to be a *fair* system ⁽²⁰⁾. Otherwise, apportioning income that is clearly attached to a particular location inevitably causes its geographic 'misattribution' – by reference to the 'sourcing' principle – since other jurisdictions where the group has (perhaps totally unrelated) operations will obtain a share of that taxable income ⁽²¹⁾. This *distortionary* apportionment can be regarded as an 'unfair' outcome if the guiding principle is that the system should assign income to where income is earned. Thus, from a theoretical point of view, there could be underlying reasons to support the division of an EU CTB between apportionable and non-apportionable elements.

- However, the principled methodological argument in favour of distinguishing between categories of income has to be evaluated with reference to other concerns that question its general validity:

- a) First, to what extent does the distinction between apportionable and non-apportionable elements create a new set of problems? At least three problematic areas can be identified:
 - (i) differentiating between business and non-business income is not always straightforward. For example, to what extent are the treasury activities of a manufacturing company to be considered as non-business income if they extend, for example, to currency speculation rather than simple hedging?
 - (ii) another problem with the distinction approach is that it removes one of the advantages of full consolidation, namely the fact that *loss offset* across all categories of the group income is 'automatic'. Instead, losses incurred from the non-apportionable categories of income, excluded from the consolidated base,

⁽²⁰⁾ But it could be deemed that a *fair* profit apportionment system is to be based on other principles, as discussed in section IV.1 below.

⁽²¹⁾ Even other jurisdictions where the group does *not* perform activities would get part of it if a general macro apportioning factor was used, as discussed below in Section IV.2.1.

would not benefit from general intra-group cross-border loss compensation and therefore an additional system of loss transfers might be required.

- (iii) the third problem is that, to apply the system correctly, *expenses* should be differentiated, as well as revenues: thus, expenses associated with 'non-apportionable' income should be identified and deducted from it in a separate calculation (for example, the proportion of the managerial or administrative costs incurred to obtain that income, etc). At the level of the apportionable CTB only expenses associated with 'apportionable' income – income of indeterminate origin – would be deducted. This entails the additional complexity of keeping an accounting system that could assign all company expenses to the two categories of 'apportionable' and 'non-apportionable' income ⁽²²⁾.
- b) Another question is: how important is the problem of merging all categories of income in the CTB? In quantitative terms, 'non-business' income might only be marginal compared to traditional 'business' income for most groups, so that the real extent of the issue is in fact limited.
- c) Even further, the issue of whether apportioning income connected to a particular location really results in 'misattribution' is in the end a matter of principles and has to be analysed from that perspective:
 - (i) On the one hand, if the guiding principle of the system is supposed to be "to assign income where income is earned", then the concern that adding all types of income into the CTB might lead to 'misattribution' or *distortionary allocation* is valid. However, to what extent is the full apportionment of both business and non-business income really *distorting*? As long as *the apportioning mechanism* reflected where the group – business and non-business – profits have been truly generated, the potential problem of income 'misattribution' would be largely resolved. For example, any profit-based apportionment method, like the value added apportioning factor explained later, could partially solve this problem (although it might also create some other problems).
 - (ii) On the other hand, if the outcome sought from apportionment is a different one (for example, "to assign income where the income-producing *capacity* is located" or another fairness objective, as explained in section IV.1), then the 'misattribution' concern of merging 'business' and 'non-business' income together no longer applies as such in principle, because not apportioning income to the strict *source* of income would not be considered necessarily a 'misattribution' outcome.

⁽²²⁾ Actually, the issues mentioned in points (ii) and (iii) of this argument (the *loss offset* across categories of income and the *expenses associated* with each type of income) come up now and again whenever segmentation of the consolidated group profits into parts is considered for whatever reason. For example, these issues are linked to the distinction between 'apportionable' and 'non-apportionable' income due to its connection to a location, but they also turn up in connection with the division between EU domestic and foreign income analysed in the next section.

In summary, the decision on whether or not to merge all types of income in the groups' CTBs should depend upon the precision in *sourcing* the origin of income sought from the "consolidation + apportionment" procedure and on how costly it would be to distinguish accurately between categories of income and the related expenses.

II.3. The territorial scope of the consolidated tax base ⁽²³⁾

Next, some of the issues concerning the territorial scope of the group CTB are considered. The question to answer is: which locations of income (ie, income sourced *where* and by the group members resident *where*) should be part of the EU-apportionable CTB? Under a worldwide combination approach, all income of all related entities would be consolidated, no matter where such income was earned – EU or non-EU-sourced income– and no matter where the group entities were tax residents – within or outside the EU. However, that seems to be far too ambitious a project at this stage. So, it is widely accepted that the company tax system under consideration would limit multi-jurisdictional group taxation to the *water's edge* of the European Union. The precise definition of the water's edge principle, however, requires further examination and a clearer understanding of all its implications. This section outlines some of the main issues arising in such a task.

For explanatory purposes, one can state that there are two types of territorial questions to consider in defining the water's edge for the purposes of an EU group taxation system. On the one hand, the related entities eligible for consolidation, obviously fulfilling group definition requirements, could be those *resident in the EU* and/or *outside the EU*; on the other hand, income accrued to the group tax base for its apportionment could be that *sourced within the EU* and/or *outside the EU*.

As each of the two options for each of these two dimensions can be combined, there are *four possible types of income* to consider when delimiting the territorial scope of the EU group taxation regime: EU-sourced income or non-EU-sourced income earned by EU-resident or by foreign affiliates ⁽²⁴⁾. The graph below represents these four scenarios more clearly: each quadrant of this two-dimensional graph corresponds to one of those types of income.

Key issues that arise in designing the scope of the EU group taxation regime can be framed into that scheme: for example, the question of income earned *where in the EU* by resident affiliates should be included in the CTB falls under (i); the treatment of

⁽²³⁾ See McLure and Weiner (2000), Lodin and Gammie (2001) and Weiner (2005), among others, for issues related to the water's edge principle and its implications for the EU.

⁽²⁴⁾ In the following discussions "foreign income" or "foreign affiliates" will be interpreted in general as "non-EU sourced income" and "non-EU-resident affiliates". If the system is applied only to a number of participating MS then "foreign income" or "foreign affiliates" should be interpreted as "income or affiliates from outside the territories covered by the scheme". All arguments are applicable otherwise from that adjusted territorial point of view.

foreign dividends or foreign permanent establishments' (PEs) income of an EU-resident group member falls under (ii); the applicability of the regime to non-resident corporations falls under (iii); the treatment of domestic EU-PEs of a non-resident corporation falls under (iv).

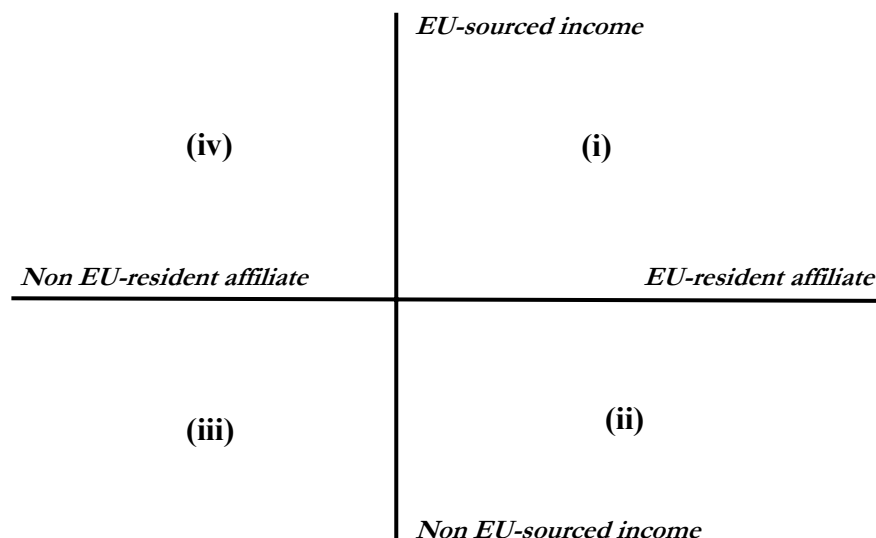


Figure 1. The territorial scope of the consolidated tax base

We will consider below different options to treat each of these four types of income in a potential EU water's edge C+A system. No case presents an obvious treatment under the water's edge approach, so all scenarios deserve attention. However, as a starting point for the forthcoming discussion it is worth recapping on how current taxation systems handle the different categories of "foreign" income, where "foreign" here stands for income sourced outside the residence state of the taxpayer. The fiscal treatment of taxpayers who obtain income from their commercial, industrial, financial or any other activity in other than their country of residence mainly follows the OECD Model Tax Convention on Income and on Capital ⁽²⁵⁾. As a rule, that Convention states that *the right to tax income of foreign origin is always conferred on the country of residence of the taxpayer*. Sometimes this right is exclusive to the residence state (as in the case of business profits that are not attributable to a PE in the source state). At other times the right to tax is not exclusive to the state of residence and the source state can also subject to taxation certain items of income: either in a limited manner (e.g. taxation of dividends or interest income at source) or without any limitation (e.g. income from immovable property or earned through PEs situated in the source state). In the latter cases, the state of residence of the taxpayer must allow some double taxation relief so as to avoid international juridical double taxation for the taxes that the income has already borne in the source state. Typically, there are two methods of relief: i.e. the exemption method and the credit method.

⁽²⁵⁾ The current legal basis for avoiding international juridical double taxation on foreign income across the EU Member States is a network of bilateral treaties largely aligned on the OECD Model Tax Convention on Income and on Capital.

II.3.1 EU affiliates' income

(i) EU income of EU-resident affiliates (Quadrant (i))

In principle, EU-sourced income earned by EU-resident affiliates is the natural eligible income to accrue to the group CTB for apportionment across the EU countries entitled to a share of it. That would definitely hold true if the apportioning mechanism were to be based on some sort of factor that divided income across *all* EU Member States (for example, a general macro factor). If, instead, the apportioning mechanism were to divide the group income only across *a subgroup of Member States* (those where the group members have taxing nexus⁽²⁶⁾ and apportioning factors), then a further concern may arise: should income from EU Member States other than that subgroup of Member States – where the group members have taxing nexus and apportioning factors – also accrue to the group CTB? For example, assume affiliate X of a given group of companies, whose members are tax residents and operate in Member States A and B. X resides in B and receives interest income (and no other income) from its investments in Member State C. Under the current residence-based taxation systems, the residence state of X, MS B, is deemed to have a right to tax that income sourced in country C⁽²⁷⁾. In the new group taxation regime, if that income was considered water's edge income for having being obtained *within the EU borders* then it would be part of the group CTB and apportioned across MS B *and A* where the group members have taxing nexus and factors. Thus MS A would also have the right to tax part of the income of the affiliate X, even though it is *not* the country of residence of the entity earning the income⁽²⁸⁾. Is that a desired effect of the C+A system? Ultimately the question is: should the water's edge income include *the whole EU* income (or income obtained in participating MS' if the system is implemented under Enhanced Cooperation) or should it be restricted to income sourced *within the subgroup of Member States where the group members have taxing nexus and apportioning factors*? The latter would imply a moving model of the water's edge borderlines, specific to each EU group.

The conceptual and practical problems implied by a more restrictive water's edge income concept (that is, including only income sourced within the subgroup of Member States where the group members have taxing nexus and apportioning factors) actually parallel the list of problems that arise when non-EU income remains outside the EU CTB. These problems include the need to keep different taxation systems at a time, the need to provide for special cost assignment and loss offsetting rules, etc. These issues are extensively discussed in the following section, so we refer to the problems analysed below to present arguments supporting either a water's edge income concept that encompasses *all income earned within the EU* (or participating MS) or a *restricted*

⁽²⁶⁾ In this paper a *taxing nexus* is understood as a link between a taxpayer and a jurisdiction sufficient to establish taxing rights. See Fox *et al.* (2005) and references therein for a more detailed discussion of the *nexus* issue.

⁽²⁷⁾ However, if that income has already been taxed at source in C, country B might apply an exemption system to prevent juridical double taxation, if it is so agreed in the bilateral double taxation treaty in force between B and C.

⁽²⁸⁾ Note that these issues are closely connected with the jurisdictions entitled to a share of the CTB, dealt with under Section III below.

version of the water's edge income, limited to the income earned *within the subgroup of Member States where the group members have taxing nexus and apportioning factors*.

(ii) Non-EU income of EU-resident affiliates (**Quadrant (ii)**)

This scenario covers income earned from non-EU sources by any group member resident in the EU: for example, income earned through a PE outside the EU, dividends received from non-EU investments, royalties, capital gains, income from immovable property or interest income of non-EU origins, business income obtained outside the EU without a PE (i.e. export sales), etc. How should those items of *foreign* (non-EU-sourced) income be treated in the new potential EU group taxation regime? In order not to clash with the current residence-based taxation systems that Member States follow and to avoid discrimination issues vis-à-vis companies not participating in the C+A system, it seems clear that non-EU-sourced income should *still be taxed in the EU* in the new regime (regardless of the possible application of some double taxation relief method for foreign taxes). However the key question is whether this non-EU-sourced income should be ascribed *to the whole group* (thus, it would be added to the group CTB and apportioned across countries, whereby several countries would have a right to tax it after its apportionment) or only *to the group member* receiving it (thus kept outside consolidation and taxed only in the state of residence of the company obtaining that foreign income). The implications of these two alternatives are discussed below.

(a) The first possibility is **including non-EU-sourced items of income earned by EU-resident affiliates in the group's EU-apportionable CTB for later apportionment across the corresponding EU Member States**. In that case, the apportionable CTB would be an EU-residence-based measure of the group income since *all* income, domestic or foreign, earned by all the EU-resident group members accrues to the CTB. Several issues arise in relation to this approach:

- The outcome of this solution would be that even countries where the specific group entity earning the foreign profits does *not* reside or operate would get a share of it for taxation purposes, as long as other group members have taxing nexus and apportioning factors there. For example, assume that affiliate X of a given group, whose units are tax residents and operate in Member States A and B, earns income through its PE in non-Member State Z. Would it be acceptable that MS A had a right to tax part of that income if the affiliate X is a tax resident in MS B? The effect of consolidating and apportioning non-EU income is that states other than the country of residence of the company earning the profits may obtain the right to tax shares of that income. Is the traditional *residence taxation principle* for assigning taxing rights compatible with that effect? How would the residence taxation principle have to be reinterpreted to accommodate that outcome? In a way, the effect is that once a group member is resident in *one* MS, it is a "*resident*" of the whole area covered by the group units, that is, *all* the Member States where the group has units established. And it follows that *all* national tax jurisdictions in that area can be deemed to have taxing rights on *all* types of (domestic and foreign) income of *all* the group members.

- This option for the treatment of non-EU income also has implications for the application of double taxation relief methods for taxes or withholding taxes borne at source on foreign income (the exemption or the credit method). Whether the tax base is determined according to HST or CCCTB principles it is important to note the need to coordinate the methods of double taxation relief used in calculating (1) the consolidated tax base and (2) the actual tax liability ⁽²⁹⁾. Whereas the tax base is calculated according to the rules of the 'home state' (the country where the parent company resides) under HST or the common rules of CCCTB, the calculation of the tax liability is in the hands of each of the individual Member States receiving a share of the CTB. Since the exemption and the credit method both have different implications for calculations of the tax base and the tax liability, some conflicts may arise unless special provisions are made: for example, if the *credit method* is meant to relieve the double juridical taxation of certain items of foreign income ⁽³⁰⁾, then non-EU net income is grossed up by underlying foreign taxes or withholding taxes when calculating the group CTB. This foreign gross income is then apportioned (together with the rest of the CTB) across the corresponding Member States. But those Member States that apply the exemption method in their national systems would not allow credits for the underlying foreign taxes on that income when calculating the actual tax liability. Thus double taxation occurs. The reverse case might also arise: if the *exemption method* is meant to be applied to some types of foreign income (according to HST or CCCTB rules), that income is not included in the calculation of the consolidated tax base. But after apportionment of this CTB, Member States that apply the credit method could give a credit for underlying taxes borne abroad by that income when calculating the actual tax liability, with the result that that income is under-taxed ⁽³¹⁾. One can see that the conflicts arise from the application of different double taxation relief methods in the calculations of the consolidated tax base (before apportionment) and of the tax liability (after apportionment). Those conflicting results call for some coordination -in applying double taxation relief methods- between the rules for calculating the consolidated tax base (HST or CCCTB rules) and the rules for calculating the actual tax liability (the rules applied by each individual Member State receiving a share of the CTB after its apportionment). Coordination should be such that if the credit method is followed to prevent juridical double taxation, foreign income is first grossed up and included in the EU CTB of the group, and then a credit for taxes borne at source is allowed when calculating the final tax liability in each Member State receiving a share of the group CTB ⁽³²⁾; on the other hand, if the method used to prevent double taxation is exemption, then foreign income is not included in the group CTB and no credit should be

⁽²⁹⁾ See Lodin and Gammie (2001) for a similar discussion of the issue in relation to HST.

⁽³⁰⁾ It may be, for example, that this is the method used by the 'home state' of the group for those specific items of income (when the HST approach was followed) or that this is the double taxation relief method provided for that type of income in the rules governing the CCCTB, if that approach to defining the CTB is taken.

⁽³¹⁾ This situation could be resolved by clauses preventing tax credits on income not taxed at residence.

⁽³²⁾ In these situations each individual Member State receiving a share of the group CTB should allow a proportional credit for the taxes borne abroad on foreign income, perhaps proportional to the share of the group CTB that the Member State receives from apportionment. This solution might bring other complications if Member States do not provide for instant full credit systems, as different credit limits and perhaps carry-forward provisions would apply in different jurisdictions.

allowed when calculating the tax liability in any of the Member States receiving parts of the CTB ⁽³³⁾.

(b) The second option is **to exclude non-EU-sourced income from the group EU "consolidation + apportionment" system**, but subject it to a separate tax scheme at the level of the company earning that foreign income, according to residence-taxation principles. In this way, the EU-apportionable CTB would strictly be an EU-source-based measure of the group income. Income from non-EU sources earned by the EU group entities would also be taxed *in the EU* but *outside* the CTB and apportioning mechanism. This foreign income would normally follow the same geographic attribution rules as at present and would be taxed in the particular Member State where the group entity earning that foreign income is a tax resident. Thus, there would be no change in the distribution across the EU Member States of tax bases from this type of foreign income compared with the current system.

- This approach to the treatment of non-EU-sourced income follows the strict interpretation of the 'residence' principle for taxation purposes: the right to tax foreign income is only attributed to the state of tax residence of the company earning the profits (where tax residence is determined by the place of incorporation or other usual rules).

- Double taxation relief methods would have to be provided for foreign taxes paid on that income at source *by each company earning that foreign income*. For example, under this approach dividends from non-EU investments would be excluded altogether from the group CTB, but subject to taxation at the individual level of the EU group member receiving them, without prejudice that usual *integration* systems would be applied to that entity to eliminate double taxation: exemption, imputation method, schedular systems, etc. However, since in this case the calculations for applying double taxation relief methods at the level of the tax base and tax liability are done under the uniform rules of a given country, the state of tax residence, in principle there would be no other latent conflict.

- An important issue that arises with this option for treating non-EU income is that the group companies involved, on top of their consolidation tax liabilities, would still have to keep separate records and fill in tax returns for their non-EU-sourced income and pay a tax bill on that income in the particular jurisdiction where each of them resides ⁽³⁴⁾. This means that multinationals and tax authorities would have to keep different tax systems: C+A to distribute the EU-sourced group CTB among Member States *and* the separate residence-based taxation system applied to non-EU income. To opt for keeping non-EU income outside consolidation may therefore create an increase in tax compliance

⁽³³⁾ It is worth noting that the issues of including in the CTB items of income subject to a withholding tax are not only relevant in connection with the foreign income: in purely "domestic"-EU cases (for instance, interest income from financial investments in participating EU countries subject to a withholding tax at source) the same sort of argument arises, especially if the credit method is applied. This type of EU-sourced net income will be incorporated into the CTB, grossed up by the withholding tax and then shared out: which of the tax jurisdictions concerned should allow the credit?

⁽³⁴⁾ Unless all sources of foreign income are exempt in the relevant EU country of residence by virtue of double taxation relief methods (i.e. the exemption method).

and administrative costs for the functioning of the whole system. The next two points elaborate on that consequence of this alternative due to a number of reasons.

- Another consideration in connection with this option is that it might be judged necessary to introduce an accounting system that permits group companies to distinguish between expenses associated with EU income (expenses that would be deducted when calculating the EU-apportionable CTB) and expenses associated with non-EU income (that would be deducted from foreign gross income in the separate system). For example, interests on debt incurred by an EU parent company to finance equity investments in domestic (EU) and foreign (non-EU) subsidiaries would have to be disentangled to assign it as appropriate to the two different systems. Obviously, the more refinement in the attribution of expenses to each type of income, the more costly the application of the whole system becomes.

- Also under this approach, if two separate systems are maintained for EU and non-EU income, loss compensation across domestic and foreign sources of income would not be automatic and an additional system of loss-offsetting across the foreign items of income might have to be provided for.

In summary, after examining the different concerns, it seems that **incorporating non-EU-sourced income earned by the EU group members into the group CTB, and apportioning it, is probably a simpler and more cost-efficient system than keeping foreign income out of consolidation. The counterpart issues, however, are whether it is acceptable to spread non-EU income across several Member States instead of assigning it solely to the place of tax residence of the company earning that foreign income and the implications for the application of double taxation relief systems.**

Finally, two further more general issues can be mentioned in relation to the area under discussion:

- One issue of certain importance is that the decision on whether to include or exclude non-EU income from the CTB also influences the choice and definition of some potential apportioning factors. In particular the water's edge for the factors should follow the same rules as the water's edge for the tax base. Thus, if, for example, *sales by destination* were agreed as one of the apportioning factors, its definition in the formulary apportionment should tie in with the definition of the water's edge income: i.e. if *exports* (outside the EU) *were not* considered part of the EU-apportionable CTB, then these sales should also be excluded from the apportionment formula (*throwout* rule); if exports *were* accrued to the CTB, then possibly a *throwback* rule would have to be applied (this is discussed in more detail later on in Section IV.2.2 under *The gross receipts factor*).

- Another point is that the decision on including or excluding non-EU-sourced income from the EU-apportionable CTB should perhaps not be addressed from such a general perspective. It might be more accurate to analyse it for each category of foreign income individually. The problem would then be to decide which items of non-EU income should be consolidated and apportioned and which ones not. For example, it might be deemed desirable to accrue business income earned outside the EU, through or

without a PE, to the group CTB, whereas foreign dividends or interest income might be eligible to remain outside the consolidated system and taxed only in the Member State of tax residence of the company receiving that income. An analysis of how *each category of non-EU sourced income* should be treated in the new potential group taxation regime goes beyond the objective of this paper, but the effects of the different possible approaches have been reviewed.

II.3.2 Non-EU affiliates' income

The next problem to address is whether to extend the C+A system to encompass non-EU-resident affiliates of a given EU-resident parent in the consolidated report ⁽³⁵⁾, at least at its option. In practice, such an arrangement would mean moving from the current income attribution rules established in international tax treaties, which are based on separate entity and SA methodologies, to a system of C+A *worldwide*. But the main problem with worldwide consolidation for EU-resident companies is the enormous difficulty of reaching agreement with a diverse group of countries about the rules for distributing worldwide income. This institutional constraint leads us to assume that only group affiliates resident within the EU water's edge will be included in the combined report of EU multinational groups for the purposes of the group taxation system under examination.

It is worth mentioning, however, that any system that excludes non-EU-resident affiliates from the EU company tax system entails at least two types of problems:

- On the one hand, as European MNEs would stay linked by means of SA to their subsidiaries run in countries outside the EU, the profit-shifting channels between the EU water's edge and the foreign affiliates would remain open (see below for a more detailed review of the likely development of profit-shifting incentives with affiliates in countries outside the C+A system). In particular, the opportunities for shifting corporate tax bases towards tax havens would remain. Costly transfer pricing obligations for transactions with non-EU affiliate companies would still have to be fulfilled by companies and monitored by tax administrations. These are not trivial issues, as the outside connections to non-EU countries represent a significant proportion of EU multinationals' operations: for example, the foreign direct investment of German MNEs amounted to USD 718 billion in 2003 (OECD, 2004). A similar point is made by Gérard (2006) by showing that all tax avoidance strategies, including transfer pricing manipulation or other lucrative detours, remain open when the MNEs operate facilities in "foreign countries", that is, countries outside the consolidation perimeter (which might include EU Member States that did not adopt the C+A method if the system were to be introduced by means of Enhanced Cooperation).

- Lodin and Gammie (2001) also note other implications of the transfer pricing issue arising in relation to operations between EU-group members and non-consolidated non-resident affiliates: any transfer pricing adjustment to transactions with a third country

⁽³⁵⁾ Therefore, parts of this section are closely connected to the 'definition of the group' issue.

affiliate will affect the consolidated income *of the whole group and corresponding apportionment* to Member States. Therefore it can be questioned: would it still be the treaty concluded by the EU country of residence of the company involved that would apply? Would negotiations on any corresponding adjustment in the third country have to be only between the authorities of that state (i.e., the EU country of residence of the company involved) and the authorities of the third country?

- Also, multi-jurisdictional groups and tax authorities would have to keep different tax systems simultaneously: SA to determine the division of the group income between the EU and the rest of the world and C+A to distribute the group CTB among the individual EU Member States.

(iii) Non-EU income of non-EU-resident affiliates (Quadrant (iii))

Given the difficulties of concluding worldwide agreements, we are assuming that foreign (non-EU-sourced) income obtained by *non-resident affiliates* of multinational groups headquartered in the EU should not be brought into the EU C+A system and obviously the apportionment factors of these affiliates should not be included in the apportioning procedure either.

It is worth reviewing here the question of whether the transition from a corporate income tax system based on SA to a system in which some countries form a C+A union while third countries remain under SA standards, increases or decreases profit shifting to tax havens outside the C+A union. The theoretical analysis by Riedel and Runkel (2006) argues that the fear that the water's edge leaves open profit shifting channels to countries outside the union and thereby undermines the aim of C+A regarding the abolishment of income shifting, is unfounded. In their model, tax bases are consolidated and apportioned to member countries according to the companies' relative capital investment and *sales by origin*-shares in each country of the C+A union, while the economic relationships with the third country are treated according to arm's length pricing standards (i.e. a water's edge regime). Their analysis is carried out under different assumptions regarding the time horizon. In the short run, when national tax rates are fixed, they show that the formation of the C+A union actually *reduces MNEs' overall volume of profit shifted to non-participating countries*. The intuition for this result hinges on the argument that MNEs base profit-shifting decisions on the tax rate differential between home and host countries. Under C+A, corporate income earned within the water's edge is taxed at the weighted average of the national tax rates (weighted by the combination of the MNE's relative investment and *sales by origin*-shares, as defined by the apportioning mechanism). This average is biased towards the lower rate if initially the lower-tax country participating in the C+A system is relatively more attractive for investment. Following a switch to C+A, the tax rate differential between a particular lower-tax (higher-tax) country in the C+A union and the non-participating tax haven increases (decreases), by reference to the initial SA system. This means that profit shifting from the lower-tax (higher-tax) C+A country to the tax haven increases (decreases), compared to the SA situation. However, the reduction of profit shifting from the higher-tax country is argued to be larger than the increase in profit shifting from the lower-tax country,

because the change in the tax rate differential is larger in the former than in the latter case (as pointed out, the weighted average tax rate under C+A is biased towards the lower-tax country in the C+A union). Thus, the analysis suggests that *a C+A system limited to the water's edge alleviates the profit-shifting problems observed under SA in the short run. In the long run*, when governments may react to each others' tax policies and engage in a tax competition game that uses the corporate income tax rates as a policy instrument, the results are less clear cut but basically point in the same direction. In this case, the actions of governments of the C+A territories impose various externalities in other countries of the C+A union. In particular, the water's edge regulation may cause a *negative* fiscal externality which may lead to inefficient *over-taxation* in the C+A union ⁽³⁶⁾. The argument is the following. If a C+A country increases its national tax rate, the weighted average tax rate in the C+A union increases and the tax rate differential with low-tax non-C+A countries (for example a tax haven) rises. Profit shifting to (from) the low-tax (high-tax) non-C+A country intensifies (diminishes), which diminishes the taxable resources *of all countries of the C+A union*. So, by increasing its national tax rate and thus prompting profit shifting beyond the water's edge, one particular C+A country imposes a negative externality on all other C+A countries of the union (and not only on its own tax base, as in the current SA system). As each country is supposed to act in such a way that it does not take into account the negative effects of its actions on others, the water's edge negative externality distorts corporate tax rates upwards in the C+A union in the long-run. However, this negative picture of the water's edge regulation in the long run is toned down by other countervailing arguments: first, this water's edge externality is in any case less detrimental in absolute terms than the profit shifting externality under SA (which results in under-taxation) and secondly, it tends to compensate for other (positive) externalities under FA that push tax rates downwards ⁽³⁷⁾ and therefore the C+A system with water's edge is more likely to bring tax rates closer to the optimal point (ie, no under or over-taxation) in the long-run. Consequently, the existence of a water's edge is ultimately likely to be beneficial.

(iv) EU income of non-EU-resident affiliates (Quadrant (iv))

Further issues can be addressed in this scenario. For example, consider a chain of ownership like this: an EU-resident parent owns a non-EU affiliate, which in turn owns an EU-established PE or an EU-established sub-subsidiary. Usually, under current rules the EU country where the PE is established can tax its income, as the source state of that income. The question is: since the PE indirectly belongs to the EU group, should its income and factors also accrue to the EU C+A calculations of that group, thus giving other Member States (where the group members have taxing nexus and apportioning factors) a right to tax a share of it? Or, if the EU PE makes a loss, should that loss be allowed to be offset against the other EU group members' potential profits? There is obviously a rationale for a *source-based* CTB scheme to include EU-sourced income

⁽³⁶⁾ In economic analysis, where the tax policy of a national government imposes a *negative* (positive) effect on other nations – and this effect is not taken into account in the maximisation problem of the particular government setting the policy – the outcome of the externality is inefficiently *high* (low) equilibrium policies (tax rates).

⁽³⁷⁾ See Section *FA and tax externalities/tax competition* below under Section IV.2.2.1 (ii).

from EU operations of non-resident affiliates. After all, if the underlying purpose of the C+A system is to share out the income *earned within the EU* by a group of related companies because its precise source might be indeterminate due to strong intra-group cross-border connections, then there is a case for including in such apportionment the income earned in those very same territories by foreign-based subsidiaries of the very same group. Obviously, those non-resident affiliates have also contributed to the group economies of integration and therefore to the group's overall EU profits which are to be distributed. Otherwise, if EU-sourced income from non-resident affiliates is left out of the water's edge report, there might be clear scope for tax planning using EU-operating foreign-based holding companies (which should be prevented by the use of special anti-avoidance rules). The possibility of including the EU income of non-EU affiliates in the water's edge report has received scant attention so far and its implications deserve thorough consideration.

To summarise, the precise definition of the 'water's edge income' is both an important and troublesome question. For the group affiliates resident in the EU the issue is whether the combined report should encompass (i) only the income earned *within the EU Member States in which the group members have taxing nexus and apportioning factors* (the most restrictive version of the water's edge); (ii) only income earned *within the EU* (or the corresponding participating Member States if the system is optional) in an EU-wide interpretation of the water's edge concept; or (iii) full *worldwide income* of the EU group members. The analysis of the different issues has proved that the fewer distinctions and segregations between geographical types of income, the less cumbersome the practical application of the system would be, though perhaps there would be more reticence about sharing income defined in accordance with broader concepts. It seems realistic at this stage not to bring non-EU-resident affiliates into the group, and so not to consolidate their income in general in the EU groups' CTBs. That option, however, leaves the door open to profit-shifting opportunities outside the water's edge through these non-consolidated foreign affiliates (although the final effect of the externality created by the water's edge regulation is not necessarily detrimental). The issue of considering EU-sourced income of those foreign affiliates for consolidation and apportionment across the EU should be studied in more detail.

III. THE JURISDICTIONS ENTITLED TO A SHARE OF THE CTB ⁽³⁸⁾

Resolving all the above questions should permit a reasonably precise definition of the total CTB to which the apportioning mechanism will be applied. The next question is: to which tax jurisdictions should the group corporate tax base be attributed? The Member States deemed to be entitled to a share of the group tax base can then apply their own corporate tax rates to the corresponding income. The tax jurisdictions receiving a share of a group CTB very much depend on the apportioning method chosen:

⁽³⁸⁾ For theoretical approaches to the jurisdictions' entitlements to tax see Musgrave (2000), Hellerstein (2003) and Fox *et al.* (2005).

- For instance, if apportionment were to be based on *macro* factors (e.g. each country's share of the aggregate EU VAT base or EU GDP) one option could be to distribute the groups' CTBs among *all* EU Member States. In that case, *all* Member States could have a claim to share the profits of *all* EU-based multinationals, even of those without any operations in a particular country. Another option could be to still distribute CTBs of EU multinational groups according to some macro factor, but only across those Member States in which a given group actually operates or the group members have their tax residence or some taxing nexus.
- By contrast, if apportionment is based on *micro* (firm-specific) factors, then there would generally be a closer link between the individual firm's activity in a member country and that country's entitlement to tax part of that multinational's income. In that case, the choice of apportioning factors also has a bearing on a country's right to share in the profits of multinationals. Only those countries in which some (or all) of the micro-factors of the formula are found should receive some of the taxable profits of a particular multinational group. That means the existence of group factors in a particular jurisdiction is a *necessary* condition to assign it a share of the profits. But there is still the issue of whether that is also a *sufficient* condition. For instance, if *sales by destination* was one of the factors of the agreed apportionment formula then any Member State in which a company sells would in principle get a share of the group CTB if no other *de minimis* requirement was established; but if no other business activity is performed there, that jurisdiction might be reasonably deemed ineligible to receive part of the group tax base. Therefore, it seems appropriate to establish some taxing nexus threshold for determining whether a corporation should be subject to tax on its corporate income in a given jurisdiction (of course provided that also some of the factors are located there). For example, the concept of PE, which is the commonly applied criterion in current tax systems to determine whether a corporation has a tax link to the jurisdiction, seems appropriate. However, due to the increased use of information and communication technologies, multinationals could be actively doing business in a certain country without the physical presence of a PE. Thus, this issue requires also further examination.

The determination of the jurisdictions entitled to a share of the CTB of EU groups depends first on the *de minimis* requirements that would have to be set for determining the *taxing nexus* between a taxpayer and a jurisdiction (i.e. sufficient links to establish taxing rights) and secondly, on the choice of the apportioning method.

IV. THE APPORTIONING MECHANISM

Having considered the main issues that arise with the delineation of the CTB and the jurisdictions entitled to a "slice of the cake", we now analyse the second part of the C+A system: *the apportioning mechanism*.

IV.1. The Evaluation Criteria

Before describing some possible mechanisms for apportioning EU multinationals' consolidated profits, it is of great importance to define some clear criteria in the light of which the different apportioning options can be assessed. For only if we identify the objectives pursued can we more sensibly compare the relative merits of the alternative apportioning methodologies. With that purpose, we need first to reflect on what would be an 'optimal' system of apportionment and then compare the different alternatives under scrutiny to that ideal reference point. It is common ground between economists and tax experts that an 'optimal' company tax system should be based on two generally accepted tax principles: *equity* and *efficiency* (where we will assume that the latter comprises normative principles such as *neutrality*, *enforceability*, *simplicity* and *cost-effectiveness*). These should therefore also be the criteria guiding the design of an appropriate apportioning mechanism. However, some of these principles can be interpreted in alternative ways and their specific meaning in the context of apportionment has to be made explicit. The following discussion goes through the most plausible definitions of these principles from the particular perspective of profit apportioning methods.

IV.1.1 *Equity*

The first criterion calls for an equitable or fair apportionment of multinationals' CTBs between different tax jurisdictions. So, in the context of designing an apportioning mechanism 'equity' is defined by reference to the *inter-nation* distribution outcome of apportionment, that is, the relative shares of multinationals' CTBs that tax jurisdictions should receive for an apportioning option to be equitable. This principle could be interpreted loosely by simply requiring that the apportioning mechanism uphold inter-nation equity *at an aggregate level*: i.e. the final outcome of dividing all EU multinationals' taxable profits across Member States should be 'fair' (no matter how fairness is defined, as presented below). However, it seems sensible to found any inter-nation equity criterion also on basic taxpayer equity. That is, an equitable inter-nation apportioning method that upholds *taxpayer equity* should guarantee that the relative shares of any multinational's CTB that tax jurisdictions receive are 'fair' (no matter how fairness is defined, as argued below). Achieving inter-nation equity at individual taxpayer level guarantees inter-nation equity at aggregate level (i.e. what is fair at individual level is fair at aggregate level), but the reverse might not be true (for example, see the macro-apportionment method below, which might respect inter-nation equity at aggregate level,

but not at individual taxpayer level). In what follows, inter-nation equity principles are defined from the point of view of individual taxpayers (i.e., corporate groups).

Beyond the discussion about basing inter-nation equity on equitable treatment of taxpayers, the definition of what is a 'fair' inter-nation outcome of an apportioning mechanism is not unambiguous and is, at the end of the day, a matter of judgment. At any rate, a clear definition of this principle is key in discussions since its implications are at the core of many of the conceptual problems raised by the design of the C+A system. The apportioning method is essentially a means for assigning income taxing rights across the countries with a 'reasonable' claim to it. But who has a 'reasonable' right to tax the income of multi-jurisdictional groups of entities engaged in integrated economic activity in more than one state? And what is the extent of that right for a given tax jurisdiction *relative to others*? These are the fundamental questions that the definition of the equity principle has to address in the context of apportionment of consolidated income. We set out below some of the possible approaches that could be embraced to defining the equity principle for apportionment purposes.

1. ***An "equal earned income" approach to a fair apportioning method:*** An apportioning method could be defined as 'fair' if it is capable of producing a geographic distribution of the CTB of *any* given multi-jurisdictional group among tax jurisdictions that reflects the distribution of *income earned* by the respective group members resident in those territories. Hence, a fair apportioning method should give more to those jurisdictions where the business is more profitable: i.e. the tax jurisdictions where the resident business units make higher profits (in absolute terms) should get larger shares of a group's CTB. And inter-nation horizontal equity would imply that jurisdictions in which the resident business units are equally profitable (in absolute terms) should get equal shares of the CTB. Thus this interpretation of an 'equitable' apportionment suggests that the *profits made by the group members by territory* (as measured by SA!) *are a proxy of the geographic source of the taxable income* for multi-jurisdictional groups. The following example illustrates the application of this approach to inter-nation equity.

Assume two of the affiliates "A" and "B" of a given group, that operate respectively in MS A and B (no other group members reside there). "A" sells for 1500 and has labour costs of 500 (assume no other production costs), thus it makes a profit of 1000 in MS A. B sells for 6000 and has labour costs of 5000 (no other production costs), thus it makes a profit of 1000 in MS B. According to the "equal earned income" approach to a fair apportionment, both tax jurisdictions A and B should obtain the right to tax exactly equal shares of the CTB of the group to be consistent with inter-nation horizontal equity. This is because the group profits made within their respective borders amount to the same total in absolute terms. If the group makes a profit in all jurisdictions where its members operate, an apportioning mechanism respecting this equity principle would assign a tax base of 1000 to each MS A and B. That is, both tax jurisdictions could tax strictly the income *sourced* within their borders according to profits made. However, if any member of the group makes a loss in any other tax jurisdiction in which it operates, that loss would reduce the CTB in the first consolidation step and MS A and B would

actually get *less than 1000* out of a 'fair' apportionment based on a profit-key mechanism. But they would still certainly get *equal shares* of the group CTB, thus complying with the definition of inter-nation horizontal equity according to this approach. Jurisdictions where the group is unprofitable overall (makes a loss) simply get nothing from the group CTB. Note that the identical tax base assignment to both MS A and B occurs *even though relative profitability of the group members with respect to production factors is different in the two jurisdictions*: whilst both affiliates make profits of 1000 each, "A" labour costs=500, while "B" labour costs=5000, thus the profitability ratio 'profits/labour costs' is higher in company "A". Apportionment based on "equal capacity to earn income" - as described below - would obviously give a different outcome in this example, when apportionment was based on payroll as factor measuring the capacity to earn income (i.e. different shares of the group CTB would be allocated to MS A and B, as, all else being equal, higher shares of the group CTB would be assigned to MS B, in which the group has more apportionment factors relative to MS A).

This approach to a fair apportionment outcome has some theoretical appeal. It seems reasonable that if the apportioning mechanism is to attribute income taxing rights fairly across tax jurisdictions it does so by allocating income according to the place where income has been generated, if that place can be determined. However, not all analysts are of the same view. As Hellerstein (2005, p 104) points out in its discussion comparing the arm's length/separate-geographic-accounting standard and formulary apportionment as methods of determining the allocation of income among states "*there are many who (...) reject the premise that the purpose of income allocation is to determine the 'true' geographic source of income. Some have taken this position as a matter of principle, arguing that income has no 'true' source and that the search for the 'true' source of income is therefore futile*". Thus, searching the 'true' source of income might not necessarily be the purpose of income allocation. And even if it was, trying to follow the source of income to distribute the groups' corporate tax bases also has the major drawback of relying on unrealistic circumstances. It is based on the key assumptions that the *source* of income of an integrated multi-jurisdictional group actually exists and that it can be determined by the place where profits are *made* (typically, as determined by SA). This is an extremely strong assumption that ignores the economic reality of the corporate groups to whom the new multi-jurisdictional group taxation system is meant to be applied, characterised by interdependence and integration of the business operations conducted in various states, all of them contributing in a fundamental manner to making the group profits. The following example is taken from Hellerstein (2005), who cites in turn Vickrey (1996): "*How can one determine the source of income of a radio station in Luxembourg advertising a product made in Belgium that is sold in France?*". It seems doubtful that in these circumstances income has a 'true' geographic source and that this true source coincides with the place where the group units make profits. In that sense, the search for the 'true' source of income, for example by disentangling the contribution to profits of the various business operations carried out in different jurisdictions, becomes pointless. Economic cross-border interdependencies make it conceptually and pragmatically impossible to determine the income of the individual group members, since activities in each unit and state contribute "*in an essential but indeterminate manner*" (Hellerstein, 2005) to the profits of the group. That

is, an "equal earned income" approach to a fair apportioning mechanism of the multi-jurisdictional groups' CTBs would be based on precisely the sort of formal spatial accounting whose basic theoretical weakness originally justified a move from SA to C+A.

If the premise that a fair income apportionment is to follow the 'true' source of income is rejected for conceptual and pragmatic reasons, one can embrace instead alternative inter-nation equity concepts, such as the following.

2. ***An "equal capacity to earn income" approach to a fair apportioning method:*** Under this approach to inter-nation equity in apportionment, an apportioning method could be defined as 'fair' if it is capable of distributing the CTB of *any* given multi-jurisdictional group among the tax jurisdictions to reflect the group members' *capacity to earn income* across those jurisdictions. In line with this view, a 'fair' apportioning method should give more to those jurisdictions where the business has more income-generating factors, as it is meant to have more *capacity* to generate income there: i.e., the tax jurisdictions where the group has more profit-producing factors relative to others should get larger shares of a group's CTB. And inter-nation horizontal equity would imply that jurisdictions in which the business has equal endowment of income-producing factors should get equal shares of the multi-jurisdictional group CTB. This implies that for the apportioning rules to be fair in this sense they have to assign proportionate shares of any enterprise's income to the states by reference to the factor(s) reflecting the underlying income-producing activities within the states. The following example illustrates how apportionment works under this principle of inter-nation equity.

Assume two of the affiliates "A" and "B" of a given group, that operate respectively in MS A and B (no other group members reside there). "A" sells for 6000 and has labour costs of 1000 (assume no other production factors), thus it makes a profit of 5000 in MS A. B sells for 1100 and has labour costs of 1000 (no other production factors), thus it makes a profit of 100 in MS B. Suppose that following an "equal capacity to earn income" principle to equity, apportionment is agreed to be based solely on the income-producing factor that is labour (payroll). Both tax jurisdictions A and B will get the right to tax exactly equal shares of the CTB of the group, thus complying with the definition of inter-nation horizontal equity of this approach. This is so because the *income-producing* labour factor is the same in both countries (i.e., labour costs=1000, both in MS A and B). Note that the identical tax base assignment to both MS A and B occurs even though the profits of the respective group members in absolute terms is different in the two jurisdictions ("A" profits=5000, "B" profits=100). An apportionment based on "equal earned income" as described above would obviously give a different outcome in this example (i.e., it would attribute different shares of the CTB to MS A and B, as it would assign a larger share of the group CTB to MS A, where the group is more profitable in absolute terms). Note also that according to the "equal capacity to earn income" equity concept, it would be 'fair' that jurisdictions where the group was unprofitable (made losses) got positive shares of the group CTB as long as income-producing factors were located there.

The "equal capacity to earn income" equity concept partly rests on the belief that cross-border economic activity is becoming increasingly integrated and thus the idea that the source of profits is associated with a particular geographical location has to be rejected. Hence for this principle a 'fair' apportioning method should not attempt to determine the 'true' source of income (even if that exists). Instead, fair apportionment should *estimate* the contribution to income made by the various countries in which interrelated economic activity of the group has taken place, by means of the various factors deemed responsible for earning income. Any apportionment of a multi-jurisdictional group CTB that follows the distribution of income-producing factors would be considered 'fair' from this point of view, regardless of the actual profits that the group members make in each jurisdiction. It could also be interpreted that this equity concept is based on the implicit assumption that profitability, compared with whatever factors appear in the apportionment formula (i.e. the ratio 'profits/apportioning factors'), is uniform across related companies operating in different jurisdictions, and that thus an apportionment of the CTB that followed the distribution of income-producing factors across jurisdictions would replicate the outcome of an apportioning system that followed the distribution of actual earned profits across countries.

Note that defining the "equal capacity to earn income" principle is not conclusive in indicating which apportioning mechanism complies with this approach, because the question of what the actual profit-creating factors are is left open to discussion. They can be deemed to be either the inputs of the businesses' production functions (labour and/or capital) and/or the demand factor (if the consumer market is deemed to contribute to the profits of the company). There is no straightforward economic basis for answering this question, which is discussed below in more detail.

An equitable apportioning method can be seen from yet another perspective, as discussed below.

3. ***A "benefit principle" approach to a fair apportioning method:*** Corporation taxes can be seen as a compensatory tax for the costs incurred by governments in providing public services from which companies benefit ⁽³⁹⁾. For example, companies benefit from infrastructure, education for the labour force, social insurance provision, economic regulation, the availability of courts and other aspects of a legal system and a variety of other public services. A 'fair' apportionment formula in accordance with the "benefit principle" would be one that measures accurately the companies' presence across countries and distributes the CTB of *any* multi-jurisdictional group according to the relative benefits obtained by the different group members from the governments' costs across countries. Thus, those jurisdictions in which the group members benefit more (relative to other jurisdictions) from the provision of public services should get larger shares of the group CTB, so that the relevant governments would be able to tax it and pay for the services they provide to the group members operating there.

⁽³⁹⁾ Of course there are also well-known arguments opposed to considering corporation taxes as 'benefit taxes': for example, the tax base of the corporation tax, i.e. income earned by companies, is by no means a proxy to estimate their benefits from public expenditure since corporations benefit, whether or not they have profits; corporate taxes vastly exceed what it costs to provide benefits, etc.

Should this be the belief of what is a fair inter-nation apportionment outcome, deciding which variables to use to measure companies' (relative) presence across countries would still not be straightforward. But perhaps *physical property* (which requires, for example, police and fire protection and economic regulation), the *number of employees* (who require, for example, public transportation to travel to work, social insurance and the provision of a legal system regulating labour markets) and/or the *number or value of business transactions* (which require, for example, consumer protection) could be plausible proxies.

The previous points have reviewed the most plausible approaches to evaluating the degree of equity of the outcomes attained by different apportioning mechanisms ⁽⁴⁰⁾. These three equity principles can be seen as alternatives (i.e., the apportioning method could try to pursue either an "equal earned income" or an "equal capacity to earn income" or a "benefit principle" objective). Each apportioning method will be analysed in the context of these three equity criteria. But it is worth noting that the answer to the question of whether an apportioning method should, in order to be fair, remunerate the true source of income (i.e., follow the "equal earned income" approach) *or* the ability to earn income (i.e., follow the "equal capacity to earn income" approach) *or* the provision of public services from which companies benefit (i.e., follow the "benefit principle"), is a matter of opinion. This highlights the fact that the choice of a guiding inter-nation equity principle for the design of the C+A regime critically depends on political judgments about what is an equitable division of corporate income among tax jurisdictions and the political perception of fairness and solidarity of a specific tax system.

IV.1.2 Efficiency Criteria

The efficiency of an apportioning method can be measured by a number of different (complementary) criteria:

Neutrality

The apportioning method should be *neutral* to economic agents' behaviour and influence economic decisions as little as possible: ideally, economic agents should behave after the introduction of the tax regime just as they would have behaved in a no-

⁽⁴⁰⁾ Other equity criteria could be imagined in theory. For example, an "*inter-nation redistribution approach to a fair apportioning method*: the apportionment of any EU multinational group's profits could be designed so as to attribute the group's CTB according to some inter-nation *redistributive* goal. The apportionment could work for example as an equalisation mechanism that would assign the tax base proportionally in favour of the relatively poorer MS. That type of result is simply too far away from the current objectives of EU corporate taxation and is not considered here.

tax scenario ⁽⁴¹⁾). In particular, in the context of allocating EU multi-jurisdictional groups' CTBs, a neutral apportioning method would not create *incentives for factor shifting* across countries so as to place the activities of the group in particular locations for tax reasons instead of business reasons. Distortions in the location of activities – for example, investing in a low tax jurisdiction for mere tax reasons – may result in a lower level of productivity of capital and reduce international competitiveness and growth, thus worsening the overall efficiency of economic activity in the Internal Market. This criterion calls for the use of an apportioning method based as much as possible on factors not prone to manipulation: for example, factors associated with a relatively stable (immobile) base should render the system more neutral and more difficult to manipulate. Other way of looking at an apportioning mechanism's neutrality properties could be by measuring its effect on governments' tax competition to attract mobile investment of multinational firms, and thus its bearing on the general level of corporate income taxation. Thus, apportioning mechanisms that do not affect governments' incentives to attract investment should be considered neutral.

Enforceability/Tax Planning Opportunities

The apportioning method (and the C+A regime in general) has to be *enforceable* in practice: it has to have the capacity to achieve its basic objective of attributing taxable income of multi-jurisdictional groups to Member States for its subsequent effective taxation. For that, the *opportunities for tax avoidance and for tax evasion* (through strategic artificial tax planning) have to be minimised. For example, for the distribution of multi-jurisdictional groups' consolidated profits this implies that the apportioning method should not create incentives and opportunities for *profit shifting* for tax reduction purposes across the tax jurisdictions in which the group members operate (for example, by manipulating the pricing of intragroup transactions or the group's debt/equity structure). If the apportioning method is easily manipulated, problems may arise, for example due to the complexities of monitoring transfer pricing policies, etc.

Simplicity and Cost Effectiveness

Pragmatic considerations cannot be disregarded. The apportioning mechanism should be *simple* in order to be workable and minimise the operating costs of the tax system for multi-jurisdictional groups' corporate income (thus, it should be cost effective). These include compliance costs for taxpayers as well as administrative costs for the public authorities that have to enforce the law (including monitoring costs, exchange of information with other administrations, etc). In order to achieve simplicity, the apportioning method could be based on factors for which data is readily available. For example, factors which are already used for other company reporting requirements and factors which are easy for the tax authorities to check. Simplicity also implies that the rules according to which taxes are levied are certain and clear to the taxpayer.

⁽⁴¹⁾ Or the comparison can also be, more realistically, between the non-neutralities of the current SA-scenario and C+A, as well as between methods of apportionment.

Whereas the equity principles outlined earlier are alternatives (the apportioning method could try to pursue either an "equal earned income" or an "equal capacity to earn income" or a "benefit principle" equity objective), the efficiency principles described above are complementary (i.e. the apportioning method should try to be neutral and enforceable and simple and cost effective).

To conclude, some of the criteria for assessing apportioning methods are closely interconnected and others are mutually incompatible, resulting in trade-offs. For example, the fewer income shifting or tax planning opportunities offered by a system, the lower the monitoring costs for administrations, which improves cost effectiveness. On the other hand, the closer a system gets to tracking the true source of income (ie, the closer it follows an "equal earned income" approach to inter-nation equity), the more costly it is to implement. At any rate, the evaluation criteria have been defined here to benchmark how an 'optimal' system should look, if it is to meet each of those principles in full. The different apportioning methods analysed in the second part of this work will be measured against all these reference 'optimal' evaluation criteria. Then the different proposals will be assessed using a system of one to three "points" for each alternative and criterion: one point (●) if the proposal does not meet the relevant criterion; two points (●●) if the proposal only partially meets the requirements of the relevant criterion; three points (●●●) if the proposal is fully in line with the requirements for an optimal system with regard to the relevant criterion.

IV.2. The Apportioning Options

The first option for apportioning the CTBs of EU multinational groups referred to in the Company Tax Study (European Commission, 2002) is whether to use (i) macro data at Member States' level or (ii) micro data from individual enterprises. Below, we describe different possibilities for these alternatives and assess them according to the equity and efficiency criteria described above.

IV.2.1 Macro-based apportionment

(i) The basic design questions

The CTB of any EU multinational group could be allocated with reference to factors aggregated at national level (*macro* factors) such as GDP, VAT bases at national level, etc ⁽⁴²⁾. A macro apportioning system could in theory be designed so as to share the

⁽⁴²⁾ The macro factors discussed here and in the examples are factors directly related to the *economic performance* of MS. In theory it could be possible to base macro apportionment on the *needs* of the MS (for example, by reference to the *per capita* income levels of MS). With that sort of apportionment, some degree of redistribution could be achieved through the EU corporate tax system to the benefit of the comparatively poorer members. However, this is not in principle the objective of the tax reform under examination and, thus, this type of apportioning mechanism is not considered here.

CTB of any EU multinational group either among *all* MS ⁽⁴³⁾ or only among *some* MS (those where the group is active).

- If the CTBs are allocated to *all* MS then each MS will receive rights to tax a *fixed* share of *any* EU multinational group's CTB, equal to its share of the aggregated factor (i.e. if MS A accounts for 5% of EU GDP, and GDP is the apportioning factor, MS A will receive taxing rights to 5% of *any* EU multinational group's CTB). This system implies that all participating EU groups would face exactly the *same average tax rates* no matter where they operate (i.e., the average of *all* the countries' tax rates, weighted according to the shares of each country in the aggregated macro factor used). This is therefore considered the most "harmonised" system, since it would combine both a common tax rate for all taxpayers ⁽⁴⁴⁾ with a common tax base.

- Assigning to *all* MS shares of *any* EU multinational groups' CTB for corporate taxation, even of those groups that have nothing to do with particular territories, might seem unjustifiable from any of the common principles for assigning taxing rights (residence or source principles). To create a somewhat closer link between individual enterprises and the apportionment process, the alternative could be to share out the CTBs using macro factors but only among those MS where the members of a given group operate. For example, if a given group operates in MS A, B and C (of the 25 MS) and the distribution of these countries' aggregated GDP is 25%-40%-35% respectively, the CTB of this group would be shared out according to those very same percentages between MS A, B and C. The tricky issue with this approach is, however, to define where the companies 'operate': is it the place where they have some sort of factors, or minimum sales, or specific taxing nexus? It is important to note that this type of apportionment offers clear tax planning opportunities: by locating qualifying factors in low-tax jurisdictions, companies can divert part of their tax bases to them. Anti-avoidance rules would have to be provided.

Whether CTBs were shared out among *all* or just *some* MS (those in which each group operates), apportionment based on a macro factor could be applied to groups operating in any industry or economic sector, so in principle no industry-specific formulae would have to be provided.

(ii) Evaluation in the light of the equity and efficiency criteria

The use of macro variables to distribute the CTB of a given group presents advantages and disadvantages from the point of view of the equity and efficiency criteria.

⁽⁴³⁾ This could be understood to mean *all those MS that agreed to take part in the scheme*, if, for example, the reform was introduced under some form of Enhanced Cooperation: this is meaning in the following paragraphs wherever *all MS* are referred to.

⁽⁴⁴⁾ That is, corporate tax rates would be harmonised or *uniform* for all taxpayers, but individual tax jurisdictions could still set the corporate tax rate of their choice.

Equity

The greatest disadvantage of this system is obviously that it may decouple an individual firm's tax payment to a member country from its real economic activity in that country. Macro-based apportionment does not comply with any of the plausible inter-nation equity principles outlined above if they are to be founded on basic taxpayer equity, as seems sensible. Macro factors cannot guarantee that those jurisdictions with "equal earned income" or "equal income-producing capacity" within their respective borders *of a given group*, or "equal benefits" provided by public services to the firms *of a given group*, would get equal shares *of that group's CTB*. In practice, the distribution of the multinational groups' CTBs according to macro factors for corporate taxation is basically a remuneration of the nations' economic performance. But this outcome cannot be grounded on any of the guiding equity principles for corporate taxation commonly assumed, because the (relative) aggregate economic performance of a given country is not necessarily correlated with the performance within its borders of *each particular EU corporate group* whose profits are to be assigned. Macro factors are in the end a rather arbitrary method of apportioning the income of *any specific group of companies*, which could raise issues of unfairness among governments and business.

Nonetheless, the degree of unfairness perceived by governments and business from a macro-based apportionment might differ. This is because, in aggregate terms, if there was a correlation between the apportioning macro factor and the distribution across MS of EU multinationals' aggregate activities (i.e. aggregate profits/tax bases or aggregate income-producing factors *by MS*) then the aggregate result, i.e. the distribution of total tax bases, might not be unacceptable to governments and could indeed be consistent with the "equal earned income", "equal capacity to earn income" or "benefit principle" approaches to inter-nation equity, though only at a MS aggregate level (not necessarily for each taxpayer individually). For example, those jurisdictions in which EU multinational groups as a whole are, in aggregate terms, equally profitable within their respective borders could get out of macro-apportionment equal shares of all EU multi-jurisdictional groups' aggregate CTBs (thus, reflecting "equal earned income" at MS aggregate level); or those jurisdictions in which the totality of EU multinational groups have in aggregate terms equal capacity to generate income within their respective borders, could get out of macro factors equal shares of EU groups' aggregate CTBs (thus, reflecting "equal capacity to earn income" at MS aggregate level). Individual taxpayers, however, could not be guaranteed equitable fiscal treatment even if a macro-apportioning factor correlated with the distribution across Member States of all EU multi-jurisdictional groups' aggregate activities was found. Any macro factor could still result in a large mismatch between a particular firm's creation of value in a particular country and its tax bill in that country.

Efficiency

- Neutrality: Macro-based apportionment avoids the distortions associated with transforming the corporation tax into a direct tax on the taxpayer's factors included in the formula. This type of distortion is exclusive to the use of firm-specific apportioning factors (micro factors) and it affects the firms' incentives to locate their factors in particular sites for the purpose of influencing the outcome of apportionment so as to eventually maximise after-tax profits. If apportionment is based on macro factors instead, any given multi-jurisdictional group's tax base will be allocated according to fixed shares across Member States, regardless of the group companies' behaviour. So there would be no formula-induced incentives to change the location of the group's economic activities, the system would not affect multinationals' economic decisions and therefore would comply with neutrality. Also there would be much less scope for tax competition between governments to attract corporate business to their territories. Indeed, the effect could be the opposite. The use of macro factors could prompt a "race to the top" on tax rates, since countries would recognise that they get *fixed shares* of EU multinational groups' corporate tax bases and thus might try to maximise tax revenues by increasing corporate tax rates. Getting fixed shares of the EU groups' CTBs to tax could be regarded as a premium for MS for participation in the new company tax system. From that point of view, the equilibrium corporate tax rates to be attained under a macro-based C+A system have to be assessed with reference to the current situation. If current equilibrium corporate tax rates were considered to be below the social optimum (for example, because they were being used by governments for harmful tax competition), a macro-based apportionment strategy could perhaps prompt a race to the optimal level of corporate taxation. This macro-apportionment strategy could perhaps also allow for a simultaneous reduction of the tax burden on labour. On the other hand, if current equilibrium corporate tax rates were already at the social optimum, a move beyond that point would be an inefficient over-taxation outcome of a macro-based apportionment. However, the remaining incentives to tax competition to attract other businesses, for example those firms not participating in the multinational groups' regime, would be a natural brake on this type of over-taxation.

- Tax planning opportunities: There are no obvious tax planning (profit shifting) opportunities within the EU if the CTB is shared out among *all* MS (opportunities to shift income outside the EU would still remain under macro-based apportionment, just as in the current SA-based system). But there are some clear tax planning opportunities if CTBs were divided only among *some* MS, since it would be easy for companies to make marginal investments in low-tax countries to which they could divert part of their CTB.

- Simplicity and cost effectiveness: The adoption of a macro-based solution to apportionment would greatly simplify taxation for both taxpayers, who would no longer have the responsibility of providing the data for the apportionment of their tax base, and tax administrations, which would not have to monitor the reliability of such information. The system provides for clear and transparent rules to taxpayers and tax administrations. In addition, it can be applied to groups operating in any economic sector or various economic sectors simultaneously, with no need of special industry-specific rules.

Assessment of apportionment based on macro-factors

<i>Equity</i>		<i>Efficiency</i>		
		Neutrality	Enforceability /Tax planning	Simplicity/ Cost Effectiveness
"Equal earned income"	● ⁽¹⁾		●●● ⁽⁴⁾	
"Equal capacity to earn income"	● ⁽²⁾	●●●	● ⁽⁵⁾	●●●
"Benefit principle"	● ⁽³⁾			

⁽¹⁾ If the macro apportioning factor correlates with the geographical (SA-based) distribution by country of EU multinational groups' aggregate corporate tax bases, then the "equal earned income" criterion for inter-nation equity can be met in aggregate terms, i.e. at national level, though there is no guarantee at all that it will be met at individual firm level.

⁽²⁾ If macro apportionment is based on some income-producing factors aggregated at national levels, then the "equal capacity to earn income" criterion for inter-nation equity can be met in aggregate terms, i.e. at national level, though there is no guarantee at all that it will be met at individual firm level.

⁽³⁾ If macro apportionment is based on factors aggregated at national levels measuring benefits provided by the national governments to the EU multinational groups' units established within their territories, then the "benefit principle" criterion for inter-nation equity can be met in aggregate terms, i.e. at national level, though there is no guarantee at all that it will be met at individual firm level.

⁽⁴⁾ If macro-based apportionment shares out the CTBs of EU multinational groups among *all* MS.

⁽⁵⁾ If macro-based apportionment shares out the CTBs of EU multinational groups only among *some* MS (i.e., those in which the groups operate and have taxing nexus).

Overall, macro shares clearly constitute an extreme case of the efficiency-equity trade-off faced when distributing the consolidated profits of EU multi-jurisdictional groups of related entities, since efficiency is fully achieved to the detriment of traditional equity principles. Although, contingent on the design, macro factors could achieve a certain level of inter-nation horizontal equity at an aggregate level, they cannot guarantee the basic requirement of fair treatment of individual corporate income taxpayers, as they can produce a large mismatch between the creation of value in a particular country by a given multi-jurisdictional group and its tax bill in that country. On the other hand, macro factors would solve any problems of factor-shifting incentives associated with apportionment and represent a simple and cost efficient method both for firms and administrations. The use of macro apportionment factors can also interact with considerations of nexus to produce unacceptable results, if it introduces an opportunity for firms to manipulate nexus to shift income to low-tax Member States and thereby unduly reduce total taxes.

McLure (2005, p 35) argues that macro-based apportionment could have anomalous effects and should not be considered seriously.

We move next to consider the main issues arising with the two apportioning mechanisms based on company-level micro data under consideration: traditional formulary apportionment and the value added (VA) key ⁽⁴⁵⁾.

IV.2.2 Micro-based apportionment

IV.2.2.1. Traditional formulary apportionment

Formulary apportionment (FA) is the best known method for sharing consolidated group profits between different jurisdictions. FA is used in several countries, the most developed systems being those used in the US and Canada for nearly one hundred years. Detailed study of the US FA system has shown that it suffers from serious theoretical and practical problems. In particular, it is highly complex because of the lack of uniformity across states regarding the factors and weights used to split income, the definition of the factors, the definition of the group, etc. Some authors argue that the EU should learn from these problems (Hellerstein and McLure, 2004a and 2004b). Canada, by contrast, presents a more successful experience of tax legislation and interpretation common to all but three jurisdictions. The Canadian provinces rely on a common definition of the tax base, common allocation factors, a common definition of the taxable entity for all provinces, etc. The no-consolidation feature of the Canadian system does not look so appealing, however, in the EU case, since not allowing consolidation would defeat many of the objectives of the reform: profit-shifting incentives between related companies would remain (through manipulation of intra-group transactions), so as costly transfer pricing issues, cross-border loss offsetting would not take place automatically, etc. Weiner (2005), Hellerstein and McLure (2004a) and Mintz (2004) outline the main insights and lessons from the US and Canadian FA experience that could be useful for EU corporate taxation.

FA tries to estimate the contribution of each jurisdiction to any given group's total taxable profits by using a predetermined formula whose elements represent *the factors that are deemed to generate the group income*. Thus, those jurisdictions in which (relative to others) there is a larger presence of that group's value-creating factors will get larger shares of that group's consolidated profits. The following **examples** show how FA works.

Take two different scenarios: a) the group has profits (according to SA) in *all* jurisdictions where it operates; b) the group presents SA-based losses in *one* of the jurisdictions where it performs its activities. Under consolidation this loss is offset cross-border to calculate the CTB in the first step (which remains positive in the example).

⁽⁴⁵⁾ We use the term formulary apportionment (FA) to refer to *traditional* formulary apportionment, ie., the sort of apportionment based on micro-factors such as payroll, property *and/or* gross receipts. Although in theory the value added key and the macro factor options could also be labelled as one-factor formulae of apportionment, we keep them out of the "formulary apportionment" terminology, which is too much associated in the literature with the idea of splitting income based on production/demand factors and with the existing systems in the US and Canada. The term "apportioning mechanism" is thus used instead as the more general expression to encompass all apportioning options under study throughout this paper.

In both scenarios, the group operates in three member countries (A, B and C, all of them participating in the C+A union). The relevant data for the group by country are described in the tables and calculations for distribution of the CTB are made according to traditional FA, using different factors and weights: (i) first using a three-factor equal-weighting formula based on payroll, property and *sales by destination*; (ii) secondly, using a two-factor formula with a weighting of 1/3 labour, 2/3 *sales by destination*.

Case a) (SA-based) Profits in <i>all</i> jurisdictions where the group operates				
Countries	A	B	C	Total
Profits (thousand €) (%)	150 (37,5%)	200 (50%)	50(12,5%)	400 (100%) = CTB
Payroll ($w_i L_i$) (thousand €)	1000	2000	1000	4000
Property (K_i) (thousand €)	3000	3500	1500	8000
Sales by destinat. (S_i^d) (th€) (i.e. to A,B,C)	4000	6000	5000	15000
Apportionment of the CTB:				
(i) Application of a three-factor equal weighting formula:				
$400 \left(\frac{1}{3} \frac{w_i L_i}{\sum_i w_i L_i} + \frac{1}{3} \frac{K_i}{\sum_i K_i} + \frac{1}{3} \frac{S_i^d}{\sum_i S_i^d} \right) =$				
	120 (30%)	176 (44%)	104(26%)	400 (100%)
(ii) Application of a two-factor formula, with weighting 1/3 labour, 2/3 sales:				
$400 \left(\frac{1}{3} \frac{w_i L_i}{\sum_i w_i L_i} + \frac{2}{3} \frac{S_i^d}{\sum_i S_i^d} \right) =$				
	104,4 (26,1%)	173,2(43,3%)	122,4(30,6%)	400 (100%)

Case b) (SA-based) Losses in <i>one</i> of the jurisdictions where the group operates and (SA-based) profits everywhere else:				
Countries	A	B	C	Total
Profits (thousand €)	150 (50%)	200 (66,6%)	-50(-16,6%)	300 (100%) = CTB
Payroll (thousand €)	1000	2000	1000	4000
Property (thousand €)	3000	3500	1500	8000
Sales by destinat. (th. €) (ie to A,B,C)	4000	6000	5000	15000
Apportionment of the CTB:				
(i) Application of a three-factor equal weighting formula:				
$300 \left(\frac{1}{3} \frac{w_i L_i}{\sum_i w_i L_i} + \frac{1}{3} \frac{K_i}{\sum_i K_i} + \frac{1}{3} \frac{S_i^d}{\sum_i S_i^d} \right) =$				
	90 (30%)	132 (44%)	78(26%)	300 (100%)
(ii) Application of a two-factor formula, with weighting 1/3 labour, 2/3 sales:				
$300 \left(\frac{1}{3} \frac{w_i L_i}{\sum_i w_i L_i} + \frac{2}{3} \frac{S_i^d}{\sum_i S_i^d} \right) =$				
	78,3 (26,1%)	130(43,3%)	91,7(30,6%)	300 (100%)

The examples show that FA attributes a share of the CTB to each jurisdiction in which the group conducts business, and that this share is independent of the particular economic performance (profitability) of the group there: in case b), member country C still receives a positive share of the group tax base even though the economic activity of the group there is not profitable (in case b) jurisdiction C still gets 26% or 30,6% – depending on the apportioning factors used – of the group CTB).

(i) The basic design questions ⁽⁴⁶⁾

If FA is to be introduced to complement an EU CTB, the following fundamental questions, at least, should be resolved.

- Which apportioning factors to include in the formula and how to define them?

In principle, FA could encompass a wide range of factors deemed to be fundamental in the income-creating process of businesses. For example, factors *at the origin of income* (i.e. inputs like *labour* and *capital*, measured in a way that reflects their inclusion in the group's production function) seem to be natural candidates for inclusion in the formula. Others believe that the formula should recognise the contribution of the place of sales or marketing jurisdictions to making profits (Musgrave, 1984). This approach makes the case for the inclusion of *sales by destination* as one (if not the only) apportioning factor.

In truth, there is no such a thing as the "right" factors for the formula from a theoretical perspective, as any formula can be justified on the grounds of one's subjective beliefs about which are the essential factors that create economic value. Hellerstein and McLure (2004a) assert that most economists would prefer origin or supply-based formulae to distribute income, but actually there is no genuine conceptual reason to prefer origin over destination. The choice of factors and their weighting cannot really be founded on principled scientific methodology, but they should ultimately reflect the political preferences as to the purpose of corporate taxation (whether it should remunerate producing or marketing states). The only correct rule might simply be the one on which Member States can agree.

Once a formula is chosen its uniform application (i.e., uniform definition of the factors, weighting, etc) across all participating Member States is assumed (which is not the case in the US).

In this regard, it is important to note the existing literature that proves the superiority of a harmonised apportioning rule compared to a methodology in which participating jurisdictions can freely decide the weight of the apportioning factors. The

⁽⁴⁶⁾ Among others, see McLure (2002 and 2005), McLure and Weiner (2000), Hellerstein and McLure (2004a and 2004b), Sørensen (2004), Weiner (2005) for discussions on the choice, definitions and/or weighting of the factors.

analysis of Anand and Sansing (2000) for the US states proves that states' social welfare (the sum of tax revenues, producers' surplus and consumers' surplus) is maximised when states coordinate the choice of the apportionment formula. This socially efficient outcome is obtained *regardless of which particular formula is chosen*. However, if states do not have their hands tied to a formula, they have unilateral incentives to deviate from any such coordinated solution: states are put into a type of prisoner's dilemma that can lead to a series of beggar-thy-neighbour policies. The apportioning choices of individual states can have negative externalities on their neighbours, which are not taken into account in each state's maximization problem, and the subsequent Nash equilibrium, with states choosing different formulae, is suboptimal. Goolsbee and Maydew (2000) also explore empirically the negative externalities that one state's freely chosen apportionment formula has on other states. In particular they show that when states unilaterally reduce the payroll weight in the formula, employment within the state does increase, but the same change reduces employment in other states to the point where the aggregate effect is close to zero. This result leads them to argue that it is difficult to maintain harmony in the formulae across states and to suggest that US states might be better off moving to a nationally uniform apportionment formula.

We consider below the main theoretical arguments for and against the inclusion of the three traditional factors, payroll, property and sales, and concerns with the definition of these factors for use in a potential apportionment formula, especially regarding their *valuation* and *location*. The US and Canadian experiences show that in many cases the definition of the apportioning factors is far from easy.

- *The payroll factor*

The *payroll* factor is meant to reflect the contribution of labour as a production factor in the generation of corporate income. In principle it is measured by employee compensation, including salaries, commissions, bonuses, etc. It would be attributed to the national jurisdiction in which the employee operates, thus allocating a portion of the taxable pie to each jurisdiction in which the labour force contributes to the production of profits. This cash-flow-based definition of the payroll factor seems fairly workable: it is feasible to measure and to locate in most cases. Nevertheless some definition issues may arise regarding how to treat other forms of labour compensation (payments in kind, employer-provided social security, pensions, etc), who should be counted as on the payroll and who should be treated as independent contractors, how to treat employees working in several states and part-time employees, etc.

Another concern could be the differences in labour costs across member countries, which have increased in the EU since enlargement. The implicit assumption in a payroll-based apportionment formula is the equal productivity of labour in all jurisdictions. However, that assumption does not hold in practice because wage levels differ significantly across the EU for various other economic reasons. The payroll factor would tend to allocate profits to high-cost countries, which might be perceived as unfair if high compensation rates were not really the result of higher productivity. However, it does not seem sustainable in the longer term to have enormous wage differences across

an economic and monetary union, so we could assume that over time labour costs would begin to move closer together across the EU and there would be no need to adjust the payroll factor for apportioning purposes. Any such adjustment would be very difficult and complex to introduce.

Alternatively, the *number of employees* could be used, instead of payroll, to avoid the problem with differences in wage levels. But potential distortions of the division of taxable income might occur even in that case, because group units with identical number of employees might indeed have rather different levels of labour productivity, but still the territories where they are respectively located would receive equal shares of the group tax base (all else being equal). If the formula is to recognise the contribution of labour productivity by country to group profitability, this approach is hardly satisfactory.

The economic effects of including payroll in the formula or of (unilaterally) changing the weight of this factor have been analysed in several theoretical and empirical studies.

McLure (1980) first demonstrated that formula apportionment largely transforms the corporate income tax into separate taxes on the factors included in the formula. In particular, by incorporating payroll in the formula, the corporate income tax is turned into a payroll tax, at least partially.

Wellisch (2000) shows as well that to the extent that (immobile) labour is used as an apportionment factor, the costs of labour exceed the local wage rate, and this reduces the demand for labour in each jurisdiction. He points at the fact that the final *incidence* ⁽⁴⁷⁾ on employment of the corporate tax under FA sheds light on the hostile attitude of unions towards any apportionment scheme that includes payroll as an apportionment factor.

Goolsbee and Maydew (2003) analyse empirically for the US the effect of a state's *unilateral* variation of the payroll component of the formula, using panel data from 1978-1994. They distinguish between two types of effects linked to this tax policy. On the one hand, there is an effect on the economic performance of the state undertaking the policy, as measured by the level of within-state employment. They show that reducing the payroll weight from one-third to one-quarter increases manufacturing employment by around 1.1%, thus the payroll weight is a significant determinant of state-level employment. On the other hand, they find that one state's unilateral reduction of the payroll weight in the apportionment formula lowers employment in other states, to the extent that the aggregate effect on employment is close to zero. It is thus clear that the negative externalities caused by unilateral manipulation of the weighting of the factors effectively puts states into a tax competition game using the weights as instruments. The argument is used to show the superiority of a uniform apportioning system for all states.

⁽⁴⁷⁾ See below for further analysis of the *incidence* effects of a FA system that includes *immobile* payroll (and/or sales) together with *mobile* capital.

In summary, literature shows that using labour as a factor for apportionment transforms the corporate income tax on a tax on labour. Firms would have incentives to reallocate labour force in low-tax jurisdictions, governments would have incentives to use tax competition to attract businesses, and there could be effects on the level of employment associated with the use and weighting of this factor in an apportionment formula. Thus, a payroll apportioning factor does not comply with the principle of neutrality.

The assessment of the payroll factor with respect to the various guiding principles is summarised in the next table.

Assessment of a payroll factor in an FA alternative

Equity		Efficiency		
		Neutrality	Enforceability/ Tax planning	Simplicity/ Cost Effectiveness
"Equal earned income"	•			
"Equal capacity to earn income"	•••	•	•••	•••
"Benefit principle"	•• ⁽¹⁾			

⁽¹⁾ Firms with a larger labour force (number of employees) possibly benefit more from public services (such as a legal system, infrastructure and economic regulation). It is doubtful whether the same applies to *payroll* (labour compensation).

- *The property factor*

The use of *capital* as one (or perhaps the only) apportioning factor seems to be widely accepted from the theoretical point of view, thus reflecting the view that capital is a key income-producing factor ⁽⁴⁸⁾. Indeed, corporate income taxation has traditionally been regarded in European economies as *a tax on the return to capital*, so a *property* apportioning factor to split corporate income can be seen as connected with that view. However, desirable as a property factor might seem from a theoretical perspective, it is beset by the most severe practical problems.

Firstly, there is a general concern with the measurement of property. In theory, for the purposes of apportioning *present* corporate income, this factor should be valued according to the *current* market value of the assets. However, this is impossible to know, since many assets may not have a price determined by market trading, and complex to implement because price fluctuations could be an important source of uncertainty for the firms' tax liability. Therefore, one would have to move back to the use of the historical cost of property. To avoid comparability issues between assets depreciated at different rates in the various group entities and/or acquired at different times, the historical value should perhaps be adjusted by depreciation according to tax rules and indexed by a rate of inflation. If companies follow International Financial Reporting Standards (IFRS) more information on market values may be available but it will always be a difficult issue. Obviously, the more precise the determination of the value of assets, the greater is the burden for tax administrations and taxpayers.

⁽⁴⁸⁾ However, Canadian provinces do not use capital as an apportioning factor (See Wildasin (2000) for a review of the Canadian apportionment system).

However, probably the most problematic aspects of the property factor relate to measuring and locating **intangibles**, which nowadays form a substantial part of the total assets of many multinationals ⁽⁴⁹⁾. Intangible assets (such as know-how, intellectual property, goodwill, patents, trademarks, etc) present major *valuation* and *localisation* problems:

- In principle, the *value* of an intangible asset should be determined by the present discounted value of the income flow the property will generate (for example, royalties paid for its use). But on the one hand, intangibles do not always yield royalties that might be used to calculate their value. On the other, more importantly, if royalties are paid intra-group (which is often the case) they can be distorted (as will be the associated asset values in the formula) if under the taxation system incentives remain to shift taxable profits from high to low-tax jurisdictions. For instance, by manipulating intra-group royalty payments firms could easily influence the valuation and localisation of the (intangible) property factor and so the distribution of the CTB and their average tax burden. The following example illustrates this. Suppose an affiliate in country B of a given group that pays royalties of 1000 to the parent company in country A. As with any other intra-group transaction, intra-group royalties will be eliminated when calculating the CTB ⁽⁵⁰⁾, and so under C+A there would be no incentive *at the tax base level* to manipulate the royalty payments between consolidated affiliates with the purpose of shifting income across tax jurisdictions (whereas those incentives do exist in the current SA-based system). However, there would still be incentives to manipulate those intra-group royalties if such payments are used to determine the *value* and *location* of the *property* (intangibles) *factor* for apportioning the group's corporate tax base. Should intangibles be included in the apportioning factor, then 1000 is the numerator of the property factor in country A (the country where the firm that owns the intangible asset is established). If country A is a low-tax jurisdiction relative to B, there are formula-induced incentives to overstate that payment. Intangibles are a clear tool for strategic corporate tax planning when used for apportionment. Thus, if intangibles were included in the property factor, intra-group royalty payments should be subject to arm's length valuation, with the corresponding search for comparables, etc. That implies that the FA system would still face some of the transfer pricing complexities currently existing under the SA methodology.

- Another alternative is to *value* the intangibles at the cost of creating and developing such property (for instance, the accumulated R&D expenses). This is not a satisfactory solution either because in most cases the market value of intangibles exceeds the costs of producing them ⁽⁵¹⁾.

- Even if intangibles are properly valued, assigning a *situs* to them is not necessarily easier (but obviously has to be done to attribute them to a particular

⁽⁴⁹⁾ See McLure (1997), Schäfer and Spengel (2003) and Fox *et al.* (2005) for more detailed analysis of the valuation and "situs" issues of intangibles in FA.

⁽⁵⁰⁾ Unless royalties were considered "non-business" income and MS opted to leave this type of income out of the CTB, following the sort of arguments given in Section II.2.2 above.

⁽⁵¹⁾ Indeed, as pointed out by an anonymous referee, the same argument could be applied in the case of investment in tangible assets that yield economic profits.

jurisdiction using the apportionment formula). In case of R&D, very often intangibles arise from the synergy effects generated by the interaction of several or all of the affiliates in a corporate group cooperating in common research projects. In that case, it might be difficult to separate the respective contributions performed in different jurisdictions. The rules for 'locating' intangibles can also be complex in cases of intra-group royalties; for instance, in the previous example it is debatable whether the intangible property should be assigned to the country that owns the intangible asset (country A in the example) or to the country where the intangible good is part of the production function of the group and thus an income-creating factor (country B in the example).

Summing up, intangible properties constitute one of the main problems of any FA system which, as seems desirable, includes a property factor. As the importance of intangibles in many corporate groups is significant and may even increase further, the valuation and location of intangibles is one of the main issues that the design of an EU group taxation system should address. It has been shown that introducing them in a property apportionment factor reintroduces the risk of giving firms an additional instrument with enormous tax planning potential. That could only be countered by increasing compliance and monitoring costs for companies and tax administrations, which the whole reform seeks to reduce. Simplicity and cost-effectiveness would probably plead in favour of excluding intangibles. Otherwise one risks having the same problems that plague arm's length pricing methodologies. In the US, intangibles are excluded from the property factor due to all these practical problems. However, to omit intangible assets from a potential EU formula altogether seems highly unsatisfactory as well. It would mean ignoring one of the potentially most important profit-generating factors, it would generally result in a misattribution of the group tax base (with an unduly low share going to jurisdictions where the corporation develops or holds more intangibles) ⁽⁵²⁾ and it could distort corporate groups' choices between tangible and intangible assets (when they were substitutes), thus rendering the tax system non-neutral and creating inefficiencies. Intangibles increasingly contribute in our economies to the creation of value and excluding them has also a big cost in terms of the inter-nation equity achieved by the C+A system as the apportionment of profits would reflect to a much lesser extent the origin of income. Rather than giving up the inclusion of intangible assets in the property factor, because of the acknowledged difficulties, perhaps more research should be directed towards seeking a more developed set of rules dealing with practical solutions for valuing and locating them.

As regards the economic effects on MNEs and governments' behaviour of including a property factor in the apportionment formula, they will be reviewed more generally below in the section assessing the general economic effects of FA ⁽⁵³⁾. For the

⁽⁵²⁾ Unless tangible and intangible assets are evenly distributed across all the group affiliates, which is highly unlikely.

⁽⁵³⁾ Most theoretical papers that investigate the economic effects of FA assume a *property* or *capital investment* apportionment factor, either as a single criterion or in combination with other factors. See, for example, Gordon and Wilson (1986), Wellisch (2002), Eggert and Schjelderup (2003), Nielsen *et al.* (2001), Pethig and Wagener (2003), Kolmar and Wagener (2005), Gérard and Weiner (2003) and Gérard (2005).

time being it is worth noting that the property factor is generally regarded as the one that introduces *more distortions* into a FA system. The reason is that capital or investment is considered as the most mobile factor of all and the one over which companies have full control as to location (whereas labour or *sales by destination*-shares are supposed to be less mobile or less controllable by firms). This makes an FA system that relies on property shares particularly prone to strategic tax-minimising behaviour through *factor shifting* across jurisdictions by firms and correspondingly more vulnerable to strategic tax competition by national governments. Thus, it does not comply with the neutrality criterion.

The above assessment of the property factor with respect to the different criteria is summarised in the following table.

Assessment of a property factor in an FA alternative

<i>Equity</i>		<i>Efficiency</i>		
		Neutrality	Enforceability/ Tax planning	Simplicity/ Cost Effectiveness
"Equal earned income"	•			
"Equal capacity to earn income"	•••	•	••	•
"Benefit principle"	•••			

- *The gross receipts factor*

The theoretical rationale for including gross receipts as an apportioning factor of the CTB is recognising the role that the place of demand plays in corporate profits: after all, profits would not be made if the goods were not sold somewhere. Thus *demand* is thought to create company income by itself, i.e. it is an income-creating factor eligible to appear in a formula that seeks to estimate the contribution of each jurisdiction to groups' profits. That is the justification for measuring and incorporating sales or gross receipts into the formula *on a destination basis*. The inclusion of a *sales by destination* factor would attribute larger shares of the group taxable profits to where the goods are predominantly sold or services performed (all else being equal). This theoretical argument is reinforced by the conventional wisdom that sales (or consumers and consumer purchases) are relatively less mobile than producing factors (in particular capital), thus the distortions from destination taxes will generally be smaller than those from origin taxes (i.e., a *sales by destination* factor complies better with the neutrality criterion). Greater relative weight on the sales factor would increase the excise tax effect on sales and reduce it on payroll and property, which is likely to create smaller overall efficiency costs from corporate taxation ⁽⁵⁴⁾.

Others (see for example Schäfer and Spengel, 2003) however question whether mere demand constitutes an income-producing factor and, as a consequence, whether a part of the taxable income should be assigned to the demand jurisdictions solely for

⁽⁵⁴⁾ See Fox *et al.* (2005) for a further elaboration of this line of reasoning. This is the main argument supporting their preferred option of a higher weight on the sales factor in the formula.

providing a consumer market. In their view, a supply approach (based only on apportioning factors from the supply side) is preferable to a supply/demand approach. Another theoretical argument questioning the inclusion of *sales by destination* in the apportionment formula is that the current assignment of taxing rights on corporate income is not based on any demand conditions whatsoever: so if demand has never played a conceptual role in remunerating tax jurisdictions for corporate taxation so far, why should it do so now? *Sales by destination* might be a factor that takes the new distribution of groups' corporate tax bases very far from the current one as it would direct large shares of EU groups' CTBs to mostly "consuming" (rather than "producing") states. Whilst any new distribution of corporate income tax bases could in theory be accepted as the "right" distribution, realistically, dramatic changes are unlikely to be accepted. The destination component of the apportionment formula, which would result in different total tax burdens for firms *depending on where they sell*, seems clearly to clash with traditional corporate taxation principles.

From a pragmatic point of view, sales in general present the advantage of being an easy factor to measure, as they are simply identified with an objective cash flow amount. But that is the only element of simplicity, because a proper definition has to be carefully considered and questions like the following arise:

- Should the sales factor include only turnover obtained in the regular business of the taxpayer (from sales of tangible and intangible property as well as from the performance of services) or should it also include proceeds from non-regular business (interest, sales of assets, rentals, etc)? If the latter were included, there would be the question of their *location*, as they could be attributed either to the recipient or to the donor's domicile (along the lines of the *sales by destination* or the "demand jurisdiction" idea).

- Logically, intra-group sales should be excluded from the valuation of this factor, as only third-party unrelated sales have contributed to the net group profits that the factor seeks to apportion. Also, if intra-group sales counted in measuring the sales factor, transfer pricing strategies could be used to overstate intra-group sales shipped to a low-tax country, or the number of intra-group transactions could be artificially manipulated to inflate the sales factor in low-tax member countries. In any case, if a gross-receipts factor was included, this sort of manipulation incentive would still remain for transactions with other non-consolidated affiliates (for example, those outside the group definition despite being EU-based). However, the scale of the transfer price manipulation would need to be much larger than in the present system to obtain an equivalent profit shift ⁽⁵⁵⁾. Therefore the sales factor is not completely exempt from transfer pricing and manipulation problems.

- The location of sales is another issue that can be problematic, as it is not always easy to identify where sales occur. The attribution of receipts from the provision of certain services and from sales of intangible property can be complex. The development of electronic commerce also makes it difficult to determine where sales take place: the

⁽⁵⁵⁾ Hellerstein and McLure (2004a), p 213, elaborate on this point.

vendor's site of establishment, the residence of the consumer, the place of consumption, the place of establishment of the internet service provider, etc. The developing profile of seller-buyer relationships makes it more and more difficult to determine the place of demand in an exact and, at the same time, cost-effective way.

- Merely making sales in a given jurisdiction is generally not considered a sufficient taxing nexus for a company (when no other factors exist there) and other minimum tax attributes are requested, e.g. a PE. However, with the emerging new technologies it is becoming easier to do business in a particular country without establishing a physical presence there. If the company does not create a physical taxing nexus in some demand jurisdictions and so they are not entitled to a share of the CTB, then selecting demand as an apportioning factor is pointless, as the underlying intention of attributing portions of income to the "demand jurisdictions" cannot be carried out.

- While the origin factors (payroll and property) have in general a clear connection with each group member individually, the sales by destination factor is connected to a territory rather than to a particular entity of the group. Thus, when there was two or more group members in the same market jurisdiction (ie parent and subsidiary/ies or two/more subsidiaries in a given jurisdiction where the group has made sales), and when the purpose of apportionment was to allocate income to group members rather than to a taxing jurisdiction, there is the issue of how to assign across group members in the same territory that part of the group's CTB shared out according to the *sales by destination* factor. The issue may have certain relevance for the groups' tax liability depending on how the loss-compensation provisions across the group members were defined. One solution could be to redistribute among the relevant group members the *sales by destination*-share of the group's CTB accrued to that territory, perhaps according to the other entity-specific factors (payroll and/or property).

- Another issue is how to account for the destination of sales of intermediate products (i.e. inputs for a final product that another company sells to a final customer) ⁽⁵⁶⁾: is the demand jurisdiction in that case the place where the intermediate product is sold or the place where the final product is sold (that is, where consumption actually takes place)? Or should intermediate sales be omitted altogether from the denominator? As a matter of fact, if intermediate sales were considered in the apportioning factor, corporate income tax would be converted into a sort of sales tax with distorting "cascade" effects over various phases of the production-distribution chain.

- Last but not least, there is the important issue of how to attribute export sales outside the area covered by the formula. In general the treatment of exports as part of the sales factor should be closely connected to the definition of the water's edge income (so the water's edge for the factors follows the same rules as the water's edge for the tax base):

a) If exports are *not* considered part of the *income earned within* the EU water's edge and are *not* consolidated for apportionment (see section II.3.1) then a

⁽⁵⁶⁾ See Schäfer and Spengel (2003), p 7.

throwout rule (exclusion of those sales from the numerator and denominator of the apportioning factor) is obviously the right option.

b) If exports are considered part of the *income* earned *within* the EU water's edge and are consolidated in the CTB in the first step, then the value of those export sales should probably be included in an apportionment formula including a sales factor (i.e. they should accrue to the denominator of the sales factor). The difficult issue arises of where (in the numerator of which tax jurisdiction) sales outside the water's edge boundaries and, in general, to a destination where the company lacks a taxing nexus, should be located. In the US, the usual procedure is to allocate such export sales to the numerator of the state of origin (the so-called *throwback* rule⁽⁵⁷⁾). This type of rule, however, re-introduces tax planning opportunities by manipulating the origin of exports⁽⁵⁸⁾. Thus, rather than a strict *throwback* rule, it would perhaps be desirable to apply a *spread throwback* rule to export sales: that is, the gross-receipts factor would attribute parts of the value of these export sales to the numerator of *all* the EU MS where the group's income is taxable. The options for applying this *spread throwback* rule could be either (a) an even distribution across all those MS where the group's income is taxable, or (b) a *proportional throwback* rule, that is, exports are assigned to the numerator of the sales factor of those countries where the group is taxable in proportion to some other factor, like for example *sales by origin*. Take, for example, a UK company with only sales to the US: should these sales be attributed to the UK and therefore assign income to the UK for taxation (*throwback*) or should they be attributed, and therefore assign income, to all the EU Member States where the group operates (*spread throwback*)? This is a key issue, as a large fraction of sales would be outside the countries covered by the formula (especially if the system is applied only in some participating MS).

The economic effects of a *sales by destination* factor in the formula have been analysed in several theoretical studies.

Gordon and Wilson (1986) argue that the inclusion of *sales by destination* (along with property and payroll) in the formula creates a particular distortion that they call "cross-hauling" of output incentives. The effect is that production in low tax rate

⁽⁵⁷⁾ See Fox *et al.* (2005) for a (critical) appraisal of the *throwback* rule in US states.

⁽⁵⁸⁾ Klassen and Shackelford (1998) demonstrate, for the US states and Canadian provinces, the opportunities for corporate tax avoidance provided by the sales factor and the *throwback* rule. The empirical test they conduct reveals an inverse correlation between the amount of sales that companies report to a given state and the state's corporate taxes levied on sales (which equals the corporate income tax rate times the state's sales apportionment factor weight). The inverse correlation is limited to states that tax sales outside their borders but require the sales to be *thrown back* to the shipping state when the destination is a state in which the company does not have nexus (*throwback* states). That is, for those *throwback* states, the higher the sales factor tax rate (which becomes the effective rate for both within-state sales and shipments to non-nexus states), the lower the manufacturing shipments from these territories. They argue that this finding is consistent with companies structuring their shipments so that sales are reported to less heavily taxed states, reducing their overall tax liability. By contrast, sales factor management appears non-existent in non-*throwback* states that apply a territorial approach (i.e. states that exclude sales to non-nexus states from the apportionment factor).

countries will be sold in high tax countries, and conversely, there will be incentives to shift production from high tax into low tax countries. The intuition behind this result is that if different firms in an industry produce in different states, and so face different tax burdens on their input factors (if payroll and property are already apportionment factors of the formula), they face different incentives concerning where to sell their output. Firms which produce mainly in high tax countries face already a high tax burden on their input factors and benefit *relatively more* from concentrating sales in a low tax country, thereby cross-haul output to reduce their tax burden. On the other hand, firms which concentrate production activities in low tax countries do not face a high-tax burden on inputs and would require less compensation to induce them to sell in a high tax country. Thus, "cross-hauling" again occurs.

Anand and Sansing (2000) study the economic incentives of states to select different apportionment formulae, with a special focus on their underlying reasons for the *choice of the weight assigned to the sales factor* (i.e., in a setting where jurisdictions can unilaterally decide upon the weight of the apportioning factors). In principle, it may be thought that increasing the weight of the sales factor is an effective economic development tool ⁽⁵⁹⁾: states assigning relatively greater weight to the sales factor (*versus* payroll and property) will be a more attractive place to locate the property and payroll for business enterprises that produce within that state and export to another states (the tax burden of those firms within the jurisdiction is reduced), whilst the tax burden of firms that produce in other states and import into that state is increased (thus, in a way the tax burden is exported to non-residents). However, the authors argue that the incentive to attract production into a state would appear to be only one of many conflicting components of a state's welfare objectives. Thus, if states desire to tax *immobile capital* (such as natural resources or agriculture) rather than attracting *mobile capital* (such as manufacturing), then this would induce states that export (import) output from immobile capital to put relatively less (more) weight on the sales factor *versus* the input factors (i.e. property and/or payroll). The model is used to predict that in a system like the US one, in which each state can freely choose the apportionment formulae, the formulae choices will vary according to a state's degree of exports and imports. This theory is found to be consistent, in an empirical exercise, with the observed differences across US states: net importer states put more relative weight on the sales factor, while net exporter states put more relative weight on production factors. In the current EU context, where the purpose is to decide on a uniform apportionment formula to which national governments will "tie their hands" and no deviations from the agreed formula should be possible (see above), Anand and Sansing's analysis is useful to predict the likely stands and incentives of the different Member States in negotiations on the choice of the uniform formula: net exporting countries would presumably emphasise production factors/inputs as apportioning factors in the formula (such as property and payroll), whilst net importers would emphasise output factors such as *sales by destination*.

Gérard (2005) argues that the introduction of a *sales by destination* apportioning factor (a variable which is assumed that cannot be affected by the firms' behaviour)

⁽⁵⁹⁾ Indeed, this argument might be behind the move observed in the US states in recent years to increase the weight on the sales factor *versus* origin-based factors.

reduces the mobility of – or the elasticity of – the tax base under FA, thereby pushing down tax competition effects induced by FA. He shows theoretically that whilst the distribution of investment as a criterion for apportioning the tax bases makes it even more desirable for a government to attract investment into national territory (by reference to SA), and is most likely to boost tax competition, this is less the case and might even be reversed if instead apportionment relies on a linear combination of two criteria, namely, the distribution of property (a variable which is under the firms' control) and another which is not under such control (sales measured on a destination basis). In the latter case, the effect of FA on tax competition by reference to SA is more ambiguous (i.e. it is not necessarily sharper).

Nielsen *et al.* (2001) and Kind *et al.* (2005) also undertake theoretical studies that use *sales* as an apportioning factor (in both cases, output or *sales by origin* coincide with *sales by destination* in the models). The results of these studies are referred to below, where the effect of FA on profit-shifting incentives is reviewed.

Lastly, it should be mentioned that adopting the alternative principle of *sales by origin* or *turnover* as an apportioning factor has not been particularly analysed in the literature so far, probably due to its obvious tax avoidance possibilities (i.e. groups could easily manipulate the shipping of sales from group members established in the most favourable jurisdictions tax-wise). Also, using *sales by origin* would undermine the whole argument for including a sales factor to compensate marketing states. Gérard (2005) argues that, in his standard setting, the use of *sales by origin* would be equivalent to using property.

To summarise the former discussion, the table below provides for a schematic evaluation of this factor in relation to the main objectives to be pursued in defining an apportioning mechanism.

Assessment of a *gross receipts by destination* factor in an FA alternative

Equity		Efficiency		
		Neutrality	Enforceability/ Tax planning	Simplicity/ Cost Effectiveness
"Equal earned income"	•			
"Equal capacity to earn income"	•• ⁽¹⁾	•••	•	•
"Benefit principle"	••			

⁽¹⁾ The assessment of whether the *gross receipts by destination* factor complies with an "equal capacity to earn income" approach to inter-nation equity depends on the subjective view of whether demand truly creates income.

- How should the factors of the formula be weighted?

If the formula includes multiple factors, each factor must be weighted by a fraction so that the sum of these fractions equals one, otherwise, under-taxation or double taxation would occur. The precise fraction of consolidated income that each factor should apportion (which is in the end the effect of the factors' weights) is, however, a matter of

judgement. If the supply approach to apportionment is favoured, greater weight should be put on the input factors (payroll and capital); if the demand approach is preferred, the *sales by destination* factor should be given more weight. The two approaches could be reconciled by a partial weighting of each of the factors they introduce in the formula: e.g. by weighting payroll and property by one quarter each and sales by one half, a balance is attained in the apportionment of income between producing and marketing states. Francis and McGavin (1992) and Weiner (2005) argue for equal weighting of destination and origin factors, for example, whilst Fox *et al.* (2005) favour higher weight on the sales factor.

If the new distribution of groups' income tax bases resulting from C+A were required not to move very far away from the current SA-based distribution, the specific weights for the factors of the formula could also be estimated using econometric analysis. For example, current SA-based profits of EU multinational groups by MS could be estimated as a function of the factors intended to be introduced in the formula: if those apportioning factors showed significance in explaining the profits generated in each national jurisdiction, the regression point estimates could form the basis for assigning the weights to each factor.

- Should the same FA method be applied to all industries or economic sectors of EU corporate groups?

The idea underlying a multi-factor formula for apportioning groups' income should be to reflect the importance of the various factors generating profits. But the use of factors varies across industries because of their production technologies (from labour to capital-intensive industries). In other cases, some specific factors could be used for certain sectors or industries to better locate the creation of value (for example, a mileage factor for the transport industry). The application of the same scheme (i.e., same factors and/or same weights for the factors) to all sectors may be viewed as inadequate, in which case, to avoid notable distortions in the attribution of income, certain industries might require special formulae. On the other hand, taking into account sectoral exceptions can increase greatly the technical difficulties of the system, partly because it introduces the additional need to split a group's income across the different lines of business in which it might operate (which should be done under SA principles). In terms of our evaluation criteria, the decision whether to introduce several industry-specific formulae in an FA methodology can be seen as a *trade-off between inter-nation equity* (as long as the various industry-specific formulae more accurately locate the income-producing capacity of each group) *and efficiency criteria* (as introducing different formulae for different industries substantially affects the cost effectiveness of the whole system).

In the US, special apportionment formulae apply for transport companies, publishing, television and radio broadcasting, financial businesses, investment companies and mutual funds, professional sports, construction contractors, satellite communication services and other miscellaneous businesses (Hellerstein and Hellerstein, 2000). In Canada, special allocation formulae apply for nine different industries: insurance corporations, banks, trust and loan corporations, railway corporations, airline

corporations, grain elevator operators, bus and truck operators, ship operators and pipeline operators (Weiner, 2005). A review of how income earned in these sectors is apportioned is beyond the scope of this paper, but the experience of those countries serves to show that in a potential EU FA system, transport businesses and financial industries are the most likely sectors that would require specific apportionment formulae.

(ii) Evaluation of FA methodology in the light of the equity and efficiency criteria

The former section specifically evaluated the traditional apportioning factors in the light of the guiding equity and efficiency principles. This section simply gives a general assessment of the FA methodology as such.

Equity

FA does not seek to track the 'true' source of income (whether it exists or not), thereby it does not serve an "equal earned income" approach to inter-jurisdictional equity. It fits well, however, with an "equal capacity to earn income" approach, as the essence of the whole methodology is distributing income according to the most consistent income-producing factors. Compliance with a "benefit principle" of corporate taxation depends on the factors used to apportion income, but in general factors like labour, capital and sales can be understood as reasonable proxies of the benefits obtained by companies from the public services.

Efficiency

- Neutrality: There has been a substantial amount of research on the efficiency implications of the FA system (by reference to SA and comparing the various possible forms FA may take), which is briefly reviewed below. The most general, unsurprising result of this research is that, in relation to neutrality, the degree of mobility of factors across jurisdictions determines the total possible distortions caused by FA. If highly mobile factors are chosen, FA may indeed affect firms' decisions, in terms of their relative location of factors in the Internal Market, as this will ultimately have effects on their total tax burden. The degree of mobility of factors has two types of economic implications: (i) firstly, possible *incidence effects* of the corporate tax systems under FA: who will ultimately bear the tax if FA converts the corporate tax into a tax on the factors but some factors can "escape" from it?; (ii) secondly, the *tax externalities* and *tax competition effects* resulting from governments trying to attract mobile factors into their territories, which would affect the general level of tax rates and revenues from corporate income taxes ⁽⁶⁰⁾. The main theoretical arguments related to these two aspects of the FA methodology are reviewed here.

⁽⁶⁰⁾ As the discussion about the corporate tax reform introducing C+A is being conducted within the context of possible "strong" tax competition between jurisdictions in the present system, this issue is analysed in greater detail below. See Giannini *et al.* (2005) for a review of the empirical evidence on tax competition.

FA and incidence effects

Wellisch (2002) analyses these issues. In a model where governments ⁽⁶¹⁾ are free to choose the relative weights of the factors and the apportionment formula includes in principle *immobile* labour and *mobile* capital, he shows that it is optimal for each jurisdiction to use only relative labour employment as an apportionment factor (i.e., all the apportionment weight is shifted to the immobile factor). This means that the allocation of capital among jurisdictions is not distorted by local taxes and that there is no tax competition among jurisdictions, so the supply of local public goods is not distorted by taxation. The intuition behind this insight parallels the results of the tax competition literature ⁽⁶²⁾: if local governments were free to tax immobile factors, they would abstain from taxing the mobile ones. Conversely, tax competition would be sharper under FA the more mobile the factors on which the formula relies.

However, by choosing the immobile factor "relative employment" as the sole apportionment factor, the burden of corporate taxation is wholly shifted from the owners of mobile capital to the "owners" of labour (i.e. immobile workers living in the individual jurisdictions), as the model shows that local wages decline by the full amount of local tax revenues. Similar results are obtained if other economic variables of the firm are used as apportioning factors. For example, if *sales by destination* is included in the formula, the outcome of apportionment will depend on the incidence of sales taxes. If a sales tax can be completely shifted forward to local consumers (because the demand curve is rather inelastic), the firm will respond to the inclusion of sales in the apportionment formula by increasing its selling price by the amount of the tax it has to pay on sales in the jurisdiction. In that case, corporate tax with a sales apportionment factor converts into a tax on consumers in the jurisdiction (instead of a tax on the owners of the firm as presumably initially intended).

The general conclusion of this analysis is that to judge the effects of corporate income taxation under FA, it is of great importance to know both the *degree of mobility* of the factors and the possible *incidence effects* of the tax (to what extent the burden of the tax can be transferred to the factors: i.e., to *workers*, if *payroll* is included in the formula, or to *consumers*, if *sales* are included in the formula). In summary, the analysis shows that the choice of apportionment factors is a trade-off between increased tax competition (with its investment location and public goods provision distortions), if greater weight is assigned to mobile factors such as capital, and probably undesirable incidence effects if greater weight is assigned to immobile factors, such as labour and/or sales (as the burden of corporate income tax, which is designed in principle to tax the owners of capital, may end up shifting to workers and/or consumers under FA based on payroll and/or *sales by destination*).

⁽⁶¹⁾ The results hold both for governments acting as benevolent agents of the electorate that maximise the utility of residents and for self-interested, Leviathan-type governments that maximise tax revenues.

⁽⁶²⁾ See Wilson (1999), Wellisch (2000) or Haufler (2001) for a comprehensive overview.

FA and tax externalities/tax competition

The strategic incentives for governments' tax policies under FA crucially rely on the number and extent of *tax externalities* that the FA method creates and which have been analysed in recent literature (mainly by reference to the externalities created under SA). Cross-border tax externalities arise when one country's tax policy has an effect on other countries' levels of investment, employment, tax revenues and/or welfare. In general, other things being equal, the larger the externalities one system produces, the more inefficient the final equilibrium is, because by maximising their own objectives (either national revenue or national welfare) tax authorities that overlook the negative (positive) spillover effects of their policies on others impose too high (low) tax rates.

The seminal work of Gordon and Wilson (1986) first suggested that tax competition will be sharper under FA (versus SA) and that the FA level of tax rates and of provision of local public goods will in general be lower. They argue that, under FA, if a state raises its tax rate to increase revenues, its revenues go up by less than it would have under SA, for any given increase in the marginal tax on capital. The reason is that in a system of perfect competition, if a country increases the marginal tax burden on capital invested in the jurisdiction, taxable pre-tax profits earned in the country will rise by a similar amount in the long run (so as to keep the after-tax profits of firms equal to zero). Under SA all of this rise in pre-tax profits will increase the national tax base⁽⁶³⁾, whereas under FA part of this increase in the tax base will outflow to other countries because of the sharing mechanism of the system. Therefore, raising revenues is harder for countries under FA, and as they ignore the benefit spillovers of their policies on other countries they tend to choose inefficiently low tax rates leading also to lower levels of provision of public goods and lower utility.

Gordon and Wilson's model also demonstrates that the move from SA (or from a direct tax on capital) to FA would have opposing effects on high tax rate and low tax rate countries, and this is so to the extent that low tax jurisdictions should favour a universal switch to FA, while high tax jurisdictions might oppose it. The intuition behind this result relies on the following argument. Under a proportional corporate tax based on SA, the marginal tax on a given marginal rise in a firm's capital investment equals the average tax payment, both in the high tax and low tax countries. However, under an FA system, a marginal investment in the high (low) tax country will be followed by a larger share of the firm's profits assigned to the high (low) tax jurisdiction. This implies that the average tax payment falls short of (exceeds) the marginal tax on this investment in the high (low) jurisdiction. It is clear that if the SA system is replaced by a FA system where each country's tax rate is set so as to produce the same marginal tax on that country's investment as existed under SA, the average tax revenues from the firms investing in the high (low) tax jurisdiction is lower (higher) under FA as compared to the SA outcome. Thus, relative to the alternative taxes on capital (SA-based profits tax or a direct tax on capital), the authors prove that universal use of FA aids low tax rate states at the expense of high tax rate states.

⁽⁶³⁾ So the model ignores the possibility of profit shifting under SA, which is a crucial assumption for the final result.

Eggert and Schjelderup (2003) extend the Gordon and Wilson result, proving that governments' use of a corporate FA tax is inefficient because it leads to sharper tax competition and lower welfare than property taxation (or SA). The extension is made to a situation where a residence-based tax on capital income (i.e. a tax on household savings) coexists with either a property tax or a corporate FA tax (which increase the user costs of capital to companies). They assume a model where identical countries compete to attract (perfectly mobile) capital, true profits equal taxable profits and, under FA, countries use the same weights for the apportionment factors, which are *property* and *sales by origin*. They find that if countries can use a residence-based capital income tax together with a property tax as fiscal instruments, the countries' tax systems are efficient in the Nash equilibrium (in the sense that a coordinated effort by all countries to change the tax structure would not improve welfare). The crucial intuitive element to this result is that, with these tax instruments, capital income cannot escape residence and therefore no fiscal externality arises from tax competition. By contrast, if the tax instruments available to countries are the residence-based capital income tax together with a corporate FA tax, the Nash equilibrium of the countries' tax systems is inefficient (the countries end up in a situation where welfare is lower than if they coordinated their respective tax systems). This result stems from the *negative externality* core feature inherent in the FA methodology: the distortion caused by apportionment through the firm activity weight across locations enables the firm to manipulate activities and relocate them to low tax countries to minimise taxes. Governments, aware of those incentives to firms, engage in a sharp tax competition game that leads to inefficient under-taxation of firms and welfare is adversely affected.

As mentioned by Sørensen (2004), Keen (1999) and Sunley (2002) have suggested another reason why a switch to FA may intensify tax competition by reference to SA. It is that under SA, attracting marginal business investment brings the *marginal* return on that investment into a country's base (leaving aside profit shifting possibilities). Under FA by contrast, attracting marginal business investment brings the *average* return on investment into a country's tax base (all profits of the MNE elsewhere are consolidated and it is the whole amount of CTB that the apportioning factor is distributing). Under the standard assumption of decreasing returns to capital, average return is higher than marginal return. Therefore, under FA countries have an additional incentive to compete to attract economic activity and tax competition may be fiercer.

In ranking FA or SA inefficiencies and tax competition effects, the above studies leave aside some of the externalities that may arise under SA: in particular, governments' interest in attracting profits (which firms can shift *via* transfer price manipulation). An alternative scenario, thus, is to compare a system of SA allowing for profit shifting *via* transfer pricing (together with concealment costs of transfer pricing manipulation) with a system of FA. Nielsen *et al.* (2001) have analysed this question. They show that the SA system is vulnerable to externality problems caused by transfer pricing manipulation and profit shifting (but this does not have any real effects on the allocation of capital in the common market), whereas FA is vulnerable to externality problems with regard to the capital allocation caused by the activity formula (while profit shifting does not occur)

(⁶⁴). In their model, each MNE consists of a parent firm in one country and a subsidiary in the other. Both the parent firm and its subsidiary produce an output using a public input and (plant-specific) capital, and the public input is acquired by the parent company and made available to the subsidiary at a (transfer) price. In this setting, they derive the effects of corporate income tax rate increases by one country on the choice of capital by firms in both countries, as well as on transfer pricing and on the cross-effects on tax revenues and welfare, both under SA and FA. Their main results are the following:

Under SA, a tax hike in one country (i) triggers a reduction in the capital stocks of MNEs *in both countries*, since the tax increase makes it less attractive to invest in capital in general, thus a *negative* externality on the other country's level of investment and tax base is imposed by the tax increase of the first country; (ii) leads to a shift in part of the taxable income to the other country, by increasing the internal transfer price, and hence makes for a *positive* revenue externality (the profit-shifting effect is more pronounced the lower the concealment cost of the transfer pricing strategy). The final effect of the initial tax hike on the tax revenues and welfare of the second country is therefore ambiguous: the net tax spillover under SA depends on the relative magnitudes of the negative and positive externalities described. In the final Nash equilibrium, tax rates may therefore be either too low or too high depending on the relative strengths of these two effects: if the *positive* profit-shifting externality dominates, for example, equilibrium corporate tax rates and revenues will be *too low*.

Under FA, it is assumed that the capital stock is the sole factor entering the sharing formula. The transfer price has no bearing on the definition of the tax base and therefore the tax liability under FA is not susceptible to transfer price manipulation. In this situation, a tax hike in one country: (i) reduces investment *in both countries* (just as under SA, the after-tax marginal return to capital falls and this leads to a reduction in overall capital in both countries), thus imposing a *negative* externality on the other country; (ii) leads to a reallocation of capital to the other country (whose tax rate has become relatively cheaper) in order to lower the effective average tax rate, which depends on the weighted average of the location of capital across the two countries. Accordingly, the second country will gain a larger share of the tax base, which is a *positive* externality of the tax increase in the first place. If the first effect (negative externality) dominates the second (positive externality), the cross-effect on capital and tax revenues (and welfare) in the second country of the tax increase in the first country, will be negative, which is likely to increase overall corporate taxes (and vice versa). Rather than intensifying a "race to the bottom" in corporate tax rates, a switch from SA to FA may thus lead to suboptimally high tax rates in the absence of international tax coordination (see Sørensen (2003) and Sørensen (2004) for explanations of the conditions under which this may happen, which relate to the relative elasticity of the domestic and foreign capital stock with respect to the domestic rate).

Lastly, Nielsen *et al.* (2001) compare the cross-effects under both systems, SA and FA, and find the theoretical conditions under which they can be ranked from a

(⁶⁴) Kolmar and Wagener (2005) make a similar analysis of the fiscal externalities arising under each system. See also Sørensen (2003) and Sørensen (2004).

welfare point of view. These conditions depend basically on how costly is it for MNEs to engage in transfer pricing and on the size of profits resulting from production. It is shown that if the pure profits of multinationals are either very low or very high, and at the same time the costs of engaging in transfer pricing are of intermediate size, a switch from SA to FA will certainly reduce tax revenues and welfare in the two countries.

To summarise, the conclusion is that **no unambiguous ranking of SA and FA taxation is possible with respect to externalities, tax competition and equilibrium tax rates**. It is not clear whether, compared to the traditional SA method, FA taxation does indeed bring smaller or stronger cross-border externalities and weaker goads for strategic tax competition by governments. General results showing whether tax competition is unambiguously "sharper" under SA or FA cannot be obtained because the set-ups of the two games are too different (Pethig and Wagener (2003) and Kolmar and Wagener (2004) stress this conclusion).

Whilst most of the papers cited above concentrate on analysing the relative efficiency-effects of FA *versus* SA as taxing methods, Pethig and Wagener (2003) compare *various methods* of apportionment from a theoretical perspective with respect to their allocative features and strategic incentives. They use a model of two identical countries, in which each country hosts a profit-maximising multinational firm that runs a subsidiary in the other country. The firm decides on domestic and foreign investment of capital and, depending on the scenario, on the demand for managerial services (a factor that all the plants share) or the demand for labour in each location. Governments are of the Leviathan type (i.e., revenue maximisers) and engage in strategic tax competition. The model yields the general insight that under these assumptions tax competition under FA will be sharper (i.e., equilibrium tax rates are lower) the more elastically the formula-determined shares of the tax base react to tax changes. So, tax competition could be mitigated under FA by choosing tax-inelastic apportionment formulae. While this finding is known from other studies (e.g. Nielsen *et al.*, 2001), the contribution of this setting is to substantiate the observation by identifying the theoretical factors that determine the tax elasticity of the apportionment formulae: they trace back the conditions determining whether one apportionment formula is more or less elastic to *properties of the production technologies*, which is ultimately an empirical issue. As an application of this general result, they show that if labour input is fixed, tax competition is – for all strictly concave technologies – sharpest under the property-share rule, followed by the sales-share rule and the payroll-share rule. If both capital and labour input choices are endogenous and technologies are Cobb-Douglas, tax competition under the property and the payroll-share rule is sharper than under the sales-share formula. Factor elasticities determine whether payroll or property-share apportionment generates sharper tax competition in the latter case.

Kolmar and Wagener (2005) elaborate on another efficiency aspect of a switch to consolidated taxation: the role of the definition of the tax base in the tax competition game that arises under FA. They argue that the nature of tax competition under consolidated taxation with FA can only be determined by analysing *jointly* both the apportioning mechanism and the tax base, since the definition of the tax base also influences the extent of fiscal externalities and the tax competition incentives under FA.

The definition of the tax base refers to its broadness and is determined in their model by the fraction of capital costs that is tax-deductible (i.e. a variable trying to capture all elements of the tax code that contribute to making the effective marginal tax rate differ from the statutory rate). In their standard framework they find that the broader the tax base the less likely tax competition under FA will be of the "race to the top" type (i.e. the less likely it is that *negative net* externalities will be involved in the game following a rise in the tax rate of a given country). In particular, they analyse the tax competition game arising under different combinations of definitions of the tax base and apportioning mechanisms. They find that for apportionment according to property shares, Nash equilibrium tax rates will always be suboptimally low relative to their cooperative levels, irrespective of the tax base (that is, a positive fiscal externality prevails regardless of the broadness of the tax base). By contrast, for sales (*by origin*)-share apportionment they find that the broadness of the tax base is decisive for the tax competition game: narrow tax bases are more likely to lead to inefficiently high tax rates or a "race to the top", while broader tax bases under this type of apportionment favour tax competition of the "race to the bottom" type ⁽⁶⁵⁾. Thus, the apportionment method should be decided in this case *together with* the definition of the consolidated base, if minimising incentives for strategic national policies is among the selection criteria for a new tax system in the EU.

There exists yet another argument, given by Gérard and Weiner (2003), suggesting that a switch to C+A may lead to lower tax rates or to increased tax competition. The argument is that tax jurisdictions would have an additional incentive to compete to attract inward business to their territories, because under FA any jurisdiction in which a group operates will get a share in a potentially positive group CTB. This is effectively a "guarantee of revenues" for a country's government even if the company makes losses there (as long as the firm makes profits overall). Governments may see FA as an insurance system against revenue losses from negative country-specific shocks and thus increase tax competition to attract business. Underlying this effect on governments' behaviour is the result that with C+A multi-jurisdictional firms' decisions on the location of investment are more sensitive to tax changes across countries: firms have further arguments in favour of locating in lower tax jurisdictions, because *even if the entity in that jurisdiction faced losses*, the overall profit of the multinational firm would be partially taxed at the rate of the lower tax jurisdiction (investment in the low tax rate jurisdiction reduces the multinational firm's average tax rate).

In summary, FA (and the particular choice of factors on which it relies) has important effects on the tax externalities and the game faced by countries deciding on tax policy. In consequence, the level of equilibrium tax rates may be affected by a switch to FA, as may the level of corporate income tax revenues and the level of provision of local public goods that can be financed with it. The research on whether FA leads to higher or lower corporate tax rates than the SA current scenario is inconclusive from a theoretical point of view. In general, it can be said that tax competition under FA is very sensitive to the choice of the apportionment factors. Intensification of tax competition under FA is all the more probable if the formula

⁽⁶⁵⁾ Of course the analysis also suggests that there is an optimal level of deductibility (which determines the optimal broadness of the tax base) for which all fiscal externalities are internalised under sales-share apportionment, but this optimal level is not determined in the study, even at a theoretical level.

adopted for distributing the groups' CTBs between the states concerned gives more emphasis to mobile criteria over which multinationals have control, such as the geographical distribution of investment. Conversely, basing apportionment on variables not subject to firms' control (either micro-factors such as *sales by destination* or macro-factors, beyond any one firm's control) might well restrict tax competition, though other *incidence and equity* concerns would arise.

The theoretical work reviewed suggests that the apportionment formula should sharply affect economic decisions. Existing empirical work, however, has not been so clear. Weiner (1994) finds no evidence that apportionment affected investment cross-sectionally. Klassen and Shackelford (1998) do find evidence that the formula matters for the location of sales, but not for decisions about real factors (employment and property). Goolsbee and Maydew (2003) analyse the effect of a state's unilateral variation of the payroll component of the formula for itself and for others. Most of the empirical work in FA tries to analyse the effect of *unilateral variations of the weight of the apportionment factors* by a given state: the effect on the level of either employment, investment or sales within or across states. The negative externalities produced by such unilateral state policies indicate in most cases that the nation would be better off with uniform state apportionment formula. In a system in which the factors' weights were fixed for all participating countries, as is proposed for the EU C+A project, these externality effects would be avoided. However, the actual empirical economic effects *per se* of a C+A system with a uniform formula, i.e. the effects due just to the distortionary burden on the factors in the apportionment formula, remain largely unknown. So empirical and simulation studies illuminating all its implications would be welcome.

Still on the neutrality effects of FA, we can say how FA matches up to (or fails to match up to) the traditional neutrality concepts that serve to assess fiscal policies in international taxation: capital export or import neutrality (CEN or CIN respectively). Under FA the average tax rate for a firm (t) is a weighted average of the ongoing tax rates in the different jurisdictions in which it operates, with the weights given by the presence of the apportionment factors of the firm in each jurisdiction relative to its total factors. It can be said that two parent companies resident in the same country, but with different t 's (because of the different location of their subsidiaries in other countries participating in the FA scheme) face a different marginal cost of capital in that state. Therefore, *capital export neutrality* is violated under FA, since it is not indifferent, tax-wise, the destination of the parents' investments. On the other hand, two subsidiary companies resident in the same country, but facing different t 's (because of the different location of their respective parent companies) also face different marginal costs of capital in the state. Therefore, *capital import neutrality* is also violated under FA, since the original location of the investment of the respective parents is not indifferent tax-wise. Thus, corporate taxation under FA fails to produce either CEN or CIN.

- Enforceability/Tax Planning Opportunities: The FA approach to sharing out consolidated income overcomes to a great extent direct *profit shifting* and *transfer pricing problems*. With FA there are no reasons for transfer pricing strategies in the intra-EU intra-group transactions of a combined group: first, because these are neutralized in calculating the CTB, and, second, because as long as the apportionment formula does not depend specifically on *profit-based factors*, companies have no tax incentives to shift profits to low tax jurisdictions. It should also be recognised, however, that the FA system is not totally exempt from profit-shifting opportunities *via* relationships of the group members with non-consolidated affiliates, for example with affiliates outside the FA area or with controlled affiliates below the qualifying ownership level agreed (McLure and Weiner (2000), Hellerstein and McLure (2004) or Gérard (2006) stress a similar point).

Although this view of the merits of FA in eliminating profit shifting incentives *via* transfer pricing strategies is widely held, there is some theoretical work that re-examines and negates this result. Nielsen *et al.* (2003) investigate the transfer pricing incentives of MNEs under oligopolistic competition. They allow transfer prices to take on a dual role in the sense that they are both tax saving and strategic devices in markets with oligopolistic competition, an approach first taken by Schjelderup and Sørgard (1997). The strategic effect arises because MNEs can benefit from setting the transfer price at a central level, but delegate decision-making about quantities (or prices) in local markets to affiliates facing oligopolistic competition. Such a strategy is beneficial to the MNE as a whole if it triggers favourable responses by local competitors. For example, if the MNE fixes the transfer price centrally but allows its subsidiaries to set quantities in local markets, a low transfer price turns the importing affiliate into a low cost firm that behaves aggressively by selling a large quantity. If such aggressive behaviour induces the local rival to behave softly by setting a low quantity, the affiliate wins market shares in local markets, which is beneficial to the MNE as a whole. The implication is that in this type of modelling the transfer price is also a strategic instrument for the corporation as it can affect the volume of sales by the affiliates in their markets (that is, the strategic role of the transfer price arises *in addition* to its tax saving role). Nielsen *et al.* show that under these assumptions of decentralised decision-making the transfer price has a tax saving role for the MNE in an FA system too (and not only in a SA system) if the share of sales is the factor for apportioning the groups' taxable income (in their model only revenue from sales is the apportioning factor, and *sales by origin* coincide with *sales by destination*). Under these assumptions an increase in local sales by the affiliates changes the tax liabilities of the MNE *via* a change in its average effective tax rate, and therefore the MNE will certainly use transfer prices to influence the share of sales in the two countries and to exploit tax differences between the two countries, if any. The implication is that if competition occurs under oligopoly, which might well be the case in certain sectors, and decision-making in multinationals is decentralised, a switch from SA to FA will not eliminate the incentives to manipulate transfer prices. They find for a numerical example that if tax rates are not harmonised, the strategic and tax-saving incentives to exploit transfer pricing may well be stronger under FA than under SA where the subsidiary of the MNE exposed to oligopolistic competition is located in the high tax country.

Kind *et al.* (2005), however, qualify the above result in their analysis. They add yet another feature to the previous type of setting by focusing on *economic integration* and its implications for transfer pricing strategies under SA and FA. Transfer prices are still allowed to play a dual role as tax saving and strategic devices in markets with oligopolistic competition and MNEs may delegate decisions about quantities or prices to their local affiliates. In this context, the degree of economic integration, taken to imply a reduction in trade costs, is shown to affect the effectiveness of transfer pricing as an instrument for profit shifting (and thereby to affect the equilibrium tax rates and national welfare) in a different way under SA than under FA. It is shown that under SA the transfer price is very sensitive to tax differentials for a high degree of economic integration, thus supporting the conventional wisdom in the tax competition literature that increased economic integration leads to lower equilibrium tax rates: economic integration increases the profit shifting propensities of MNEs, the national tax bases are more sensitive to tax differentials across countries and governments tend to set corporate tax rates inefficiently low to prevent the flight of their national tax bases. Under FA, by contrast, the model shows that the relationship between the sensitivity of transfer prices to tax differentials and the degree of economic integration moves in the opposite direction: the more open the economy, the less sensitive transfer prices are to tax differentials across countries, the less effective they are in shifting profits internationally, and eventually the less sharp tax competition will be and the higher the equilibrium tax rates will be. The argument relies on the intuition that the effect of changing the transfer price on the apportionment of tax bases across countries varies inversely with the degree of openness of the economy. In a closed economy (with high trade costs) the foreign subsidiary, which is assumed to pay the trade costs, is a high cost company in the local market, with a rather small volume of sales and a low share of total sales initially. In these conditions, a strategic change of the transfer price from the central level to the affiliate has a large effect on the level of sales abroad. In the model, MNEs are assumed to pay taxes under FA according to their relative levels of *revenue from sales* (i.e. *sales by origin* or output, which coincide with *sales by destination* in this model). These conditions give MNEs an incentive to manipulate transfer prices conveniently to change significantly the relative share of sales in the various jurisdictions where they have activities: for example, by lowering the transfer price, the affiliate becomes a lower cost company that may capture a relatively important market share in the oligopolistic market in which it operates, thereby reducing the average tax rate of the MNE if the affiliate is established in a low tax country. In an open economy, however, where trade costs are low, the foreign affiliate's share of total sales is initially quite large. Then the tax gain from changing the transfer price is only limited, as changing it will not substantially change the relative shares of sales. So, under the model conditions, the transfer price is less sensitive to changes in tax rate differentials across countries the more integrated the economies, which allows countries to increase their tax rates overall.

- Simplicity and Cost-Effectiveness: FA can be assessed as a moderately simple and cost-effective method. On the one hand, it fits well with one of the main objectives of the C+A reform, which is reducing multinational companies' compliance costs (partly because it eliminates transfer pricing obligations related to intra-group transactions in most cases). However it also presents clear difficulties, such as the need to maintain SA procedures for splitting income between different lines of a corporate group's business (if industry-

specific FA is applied), the need of dealing with the evaluation of intangibles in calculating a representative property factor, etc.

Lastly, it is worth mentioning another feature of FA, which is that it offers great *flexibility* in the design of its basic elements (factors, weightings, etc), enabling it to be shaped as necessary so as to achieve political agreement. However, this very same feature could be perceived as showing simply the *arbitrariness* of this methodology.

The following table summarises the assessment of the FA methodology by reference to the tax principles described.

Assessment of the FA methodology

Equity		Efficiency		
		Neutrality	Enforceability/ Tax planning	Simplicity/ Cost Effectiveness
"Equal earned income"	•			
"Equal capacity to earn income"	•••	•	••	••
"Benefit principle"	•••			

In summary, the FA methodology complies with the "equal capacity to earn income" approach to an equitable inter-nation apportionment, as by definition it attributes groups' consolidated profits according to the distribution of the groups' income-producing *capacity* -as measured by the apportioning factors- across the different tax jurisdictions (although the actual income-creating factors to be included in the formula are open to argument). However, using apportionment factors that are specific to particular taxpayers might affect incentives regarding the location of the economic activities that comprise the factors (labour, property and sales) and as long as these factors are relatively mobile, FA might introduce some tax-induced economic distortion concerns with regard to the functioning of the Internal Market. Although FA's simplicity regarding data collection and especially its help in reducing transfer pricing costs for business and administrations count in its favour, it also may involve some complexities in its practical application (like the use of different formulae for different economic sectors, the valuation of intangibles, etc).

IV.2.2.2. The Value Added option

The possibility of using a value added key for sharing out the CTB was raised in the recent debate by Lodin and Gammie (2001) (See also Hellerstein and McLure (2004a) for an analysis of a VA-based apportionment). The implications of this approach are further considered below.

(i) The basic design questions

- Defining Value Added for apportionment purposes

Value Added (VA) is an economic concept that can be defined and measured in several ways. There are a number of *dimensions* to the VA concept, which mainly refer to temporal and spatial considerations (*when* and *where* value should be considered to have been added) and to its practical measurement (*how* the value added by a company can be calculated). For each of these dimensions of the concept there could be different *options*. The most appropriate definition of the VA concept (i.e. the choice of the right option for each of these dimensions) depends on the function it serves. For instance, the definition of VA for use as the tax base in *a tax on consumption* (VAT) does not necessarily coincide with the concept of VA to be used to apportion a CTB for *corporate income tax* purposes, as will be made explicit here. This section discusses the definition of VA that should be used for the purpose of apportioning a CTB for subsequent corporate income taxation.

The *dimensions* to take into account when trying to define the value added by a company are: (i) the methodological issue of *calculation* of VA (either by the addition or the subtraction methods), (ii) the treatment of *capital expenditures* and their temporal imputation, (iii) the *spatial measure* of VA (by origin or by destination).

(i) **Calculation of the value added:** There are typically two ways of calculating the value added by a business in a given period of time:

* A subtraction-based VA is calculated by subtracting *inputs* from *outputs* in a given period of time (where the *inputs* do not include wages and may or may not include capital purchases or depreciation – see below "*The temporal imputation of capital expenditures*"). This production-based approach to the VA concept therefore gives a measure of the total economic value produced by a business in a period of time. More precisely, VA is the difference between total *value of production* minus the total *value of consumption* by the company in that period of time:

$$VA = \text{Total Value of the Output (Production)} - \text{Total Value of the Inputs (Consumption)}$$

Production by a company does not necessarily coincide with sales, and nor does its consumption necessarily coincide with purchases *in a given period of time*, therefore there should be some adjustments for the initial and final inventories (in that period) of the produced goods and inputs. So, it would be appropriate to define the previous components of the formula in this way (for a typical manufacturing company):

Total Output (Production) = Sales + Final Stocks - Initial Stocks (of final goods)

Total Inputs (Consumption) = Purchases ⁽⁶⁶⁾ + Initial Stocks - Final Stocks (of inputs or raw materials used to make the final product)

* An addition-based VA is calculated by measuring VA as the total remuneration to the production factors employed. It therefore breaks down where the value added by a company goes, that is, it is a distribution-based approach to the VA concept. More specifically, it is the sum of the compensation to the 'labour' factor (*personnel remuneration*) and the return to the 'capital' factor. In addition, the latter can be approximated as the sum of *interest paid* (remuneration to debt-financed capital or borrowing costs) plus gross *before-tax profits* (remuneration to equity capital, which will be either retained or paid out as dividends, after the corresponding tax payments).

Leaving aside spatial- and temporal-specific notations, we denote the components of this measurement of value added by a company in the following way ⁽⁶⁷⁾:

$$\text{Value Added} = \text{Labour Compensation} + \text{Interests} + \text{Profits}$$

$$VA = wL + rI + \Pi$$

L stands for the number of employees, w for average wage per employee; rI is remuneration of debt-financed capital or interest paid (r stands for the interest rate and I for the total level of capital borrowed) and Π is gross before-tax profits.

Both methods, the subtraction-based and addition-based concepts of VA, should in theory produce the same figure. Their respective components could be defined in such a way that they both arrive at the same total amount of VA in a given period. So they can be understood as the reverse of each other: the difference between total production and total consumption by the company in a given period of time (the subtraction-based definition) goes to remunerate labour and capital (the addition-based definition). Therefore the choice between these two ways of calculating the VA is not founded on a conceptual superiority of one method over the other as to the actual measure of VA they achieve. The amount reached by both methods should be the same (unlike the choice between the different options for the temporal and spatial measures of VA analysed below). The choice between the two approaches is justified by some other concerns:

⁽⁶⁶⁾ Whether to include *exports* in the *sales* and *imports* in the *purchases* factors of these formulae depends respectively on the approach taken – VA by origin or by destination (see below "*The spatial measure of the value added*"). For instance, an origin-based VA concept would mean adding up "domestic sales + exports" to calculate total *sales* and accounting for "domestic purchases + imports" to calculate total *purchases* respectively in those two equations. Also, whether to add capital expenditures or not or its corresponding depreciation in a given period to the *Total Inputs* depends on the approach to "*The temporal imputation of capital expenditures*" taken (see below).

⁽⁶⁷⁾ Capital expenditures or depreciation would be included in this expression depending on the approach to "*The temporal imputation of capital expenditures*" taken. Also, the corresponding adjustments to this expression should be made to accommodate the approach to "*The spatial measure of the value added*" taken, ie by including/excluding exports or imports correspondingly, depending on whether VA is to be measured at origin or at destination.

* The VA apportioning key and profits: On the one hand, the addition-based VA approach brings to light the important fact that VA by a company in a territory is actually determined in part by its profits in that territory, as profits are one of the three components of the above addition-based VA definition. This feature is central to an examination of the VA key for apportioning groups' CTBs, since the main strengths and weaknesses of this approach depend on precisely that element, as the evaluation of this method will prove later on. For the time being, in relation to the choice between a subtraction-based or an addition-based approach to allocating groups' CTBs across jurisdictions, one should note that the addition-based scenario would allocate taxable *profits* by using a formula that has *profits* as one of its factors. That is somehow inconsistent, since if one knows where profits occur, as the addition-based formula above assumes, then there is no need to allocate them through an apportioning mechanism. This circular argument highlights the fact that the addition-based calculation of VA would actually be difficult to accept and implement, as profits would have to be calculated by location *explicitly*, which is exactly what the C+A system tries to circumvent. So this concern calls for the use of the subtraction-based VA notion if a VA key is to be used for apportioning the groups' profits. Under that methodology, profits would still be *implicit* in the VA amount calculated for each location under the subtraction basis, but the exact sum of profits by location is not necessarily known.

* Practicalities of data collection: On the other hand, if the information actually reported in VAT returns is to have any role in calculating the VA by a company for apportioning purposes (with the corresponding adjustments), then this implicitly favours the subtraction-based method, on which the current VAT system is *indirectly* (ie, by using the credit method) based.

(ii) The temporal imputation of capital expenditures: the question of *when* the value should be considered as having been added refers mainly to capital expenditures, which could be imputed at different times. There are typically three options in this matter that give rise to three different measures of the VA *in a given period*:

* Gross product-type value added: the VA is calculated without allowing for any deduction of capital expenditure (either for the cost of capital or for depreciation).

* Income-type value added: the VA is calculated allowing a deduction, over a given period of time, for the depreciation of capital investments.

* Consumption-type value added: the VA is calculated with capital investments in a given period being completely deducted in that period.

The choice of one of these options for the temporal imputation of capital expenditures would in general influence the measurement of VA *in a given period* and therefore would eventually affect the result of apportionment. It seems clear that for apportioning purposes the income-type measure of VA should be favoured, and depreciation (the proportional cost of capital used in the production process over a given period) should be deducted, just like any other production cost: since the flow of

corporate taxable income is calculated allowing for the deduction of the consumption of capital in the period ⁽⁶⁸⁾ it seems plausible that the mechanism apportioning that income also takes account of the depreciation of capital investments (ie, the income-type VA).

So, *income-type value added* is conceptually superior to the alternatives for profit allocation purposes. The VA concept used in the current VAT system relies instead on a *consumption-type* definition of VA ⁽⁶⁹⁾. So, if VAT reports should have any role in the calculation of VA for apportioning purposes, then the consumption-type VA measure implicit in the present VAT system will have to be converted yearly to an income-type VA. This should be done by adjusting for depreciation allowances instead of immediately deducting the cost of capital expenses as at present: to be more explicit, to convert from consumption-type to income-type VA, capital investment is added in the year of investment and depreciation allowances are subtracted proportionally over the corresponding years. Such calculations could actually be rather complicated ⁽⁷⁰⁾, and they would involve several annual adjustments for each capital investment by a company.

(iii) ***The spatial measure of value added:*** The third element to take into account in defining VA is the *territorial scope of the VA concept* (where should the value be considered to have been added?). The question is especially relevant if the resulting concept is to be applied to multinational companies that operate in several countries (production in one or several countries, sales in yet other countries, etc). As this would be the typical situation in which the VA concept that concerns us here would be applied, this dimension of the definition of VA is crucial to our interests. There are two possible approaches:

* ***Origin-based value added:*** value is considered to have been added where production takes place (the origin of income). For cross-border transactions, this means that to calculate this measure of the value added by a company *in a given country*, exports should be added (as they have been produced in the country, so their value constitutes a part of the VA of the business activity of that producer state) and imports should be subtracted (as they have not been produced in the country concerned).

* ***Destination-based value added:*** following this approach, value would be considered to have been added where consumption takes place (the destination of production). Again, for cross-border transactions, this means that to calculate this measure of the value added by a company *in a given country*, exports should be excluded (as they have not been

⁽⁶⁸⁾ Depreciation allowances would be uniform across MS in a CCCTB, unlike current corporate income tax depreciation allowances that differ in general across countries for the various types of assets.

⁽⁶⁹⁾ The total VAT borne in acquiring capital goods by a VAT operator can be fully deducted immediately, in the VAT returns for the period, from the VAT charged on sales in that same period.

⁽⁷⁰⁾ The reconstruction of an income-type VA measure from the consumption-type VA concept underlying VAT returns in a given year can be very complicated in some cases, such as where the company is entitled to deduct only a proportion of the VAT borne in acquiring capital goods (because part of its turnover corresponds to operations exempt from VAT), or if it disposes of its capital goods before the end of the "adjustment time", etc. It is even more complicated if we take into account that such conversion has to be done simultaneously for all – possibly overlapping – investments.

consumed in the country) and imports should be added (as they have been consumed in the country).

The choice between the origin-based and the destination-based measure of VA for apportionment purposes has some clear economic implications. Using VA at origin or at destination gives in general different measures of *total* VA by a group of companies consolidating profits within the total area covered by the apportionment formula and also a different proportional split in the total amount of VA between the various jurisdictions in which the group operates. The effect of using VA *at origin* to apportion the CTB would be that those jurisdictions where a multinational group has *produced* relatively more output would be considered to have contributed more to the total economic profitability of the firm, and hence would get a larger share of the consolidated profits (even if the firm sold very little there, as most of its sales might be exports). Conversely, VA *at destination* used for apportionment would allocate larger shares of the profits to the countries where the group has *consumed* relatively more (for example, where it had more imports, all else being equal). So, apportionment of the CTB using an origin-based or a destination-based VA concept implies respectively the apportionment of the corporate tax base to relatively larger producing or consuming States where the groups operate. For this reason this dimension of the definition of VA turns out to be of particular relevance for the apportionment of the CTB issue.

The VA concept currently used as the tax base for the EU VAT system is destination-based, so the VAT base is allocated to consuming States. That is certainly justifiable, as VAT is intended to tax consumption⁽⁷¹⁾. But if the objective is to distribute a tax base for *corporate income taxation*, then the destination-based approach to VA is conceptually much less appealing, since the use of VA at destination as apportioning factor would potentially attribute profits chiefly to where the goods are sold rather than to where they are produced. As pointed out above (in relation to FA) it is impossible to say as a general theoretical principle whether profits should be regarded as accruing in producing or in marketing states. There may be some rationale for recognising that the place of consumption has contributed, along with the place of production, to achieving profits (as the introduction of a *sales by destination* factor in traditional FA acknowledges). Nevertheless, if one is to choose between the origin-based and the destination-based measure of VA⁽⁷²⁾ for profit allocation purposes, then value added at origin is probably the most meaningful concept. It is worth noting, however, what this approach actually means for the apportioning mechanism. It means that the use of VA at origin backs up firmly the supply-based view of apportionment, in Musgrave (1984) terminology. The demand considerations that justify the assignment of some income to the jurisdiction that provides the market are totally ignored in this approach.

To summarise, what is the appropriate VA measure for the purpose of apportioning the CTB? The discussion above has shown that the definition of VA for apportioning purposes might be intrinsically different from the definition of VA as the tax base for a consumption tax such as the EU's VAT. **A conceptually plausible VA-**

⁽⁷¹⁾ So it seems *fair* that countries where there is more consumption have larger tax bases.

⁽⁷²⁾ The use of a mixed concept of VA (for instance, a weighted average of VA *at origin* and *at destination*) does not seem feasible and would be meaningless.

based apportionment formula should probably involve *an origin-based* rather than a destination-based VA concept and should also be calculated as an *income-type VA measure* (that is, accounting for depreciation allowances). The choice of a *subtraction-based* rather than an addition-based method of calculating VA is dictated by conceptual concerns and the practicalities of data collection.

- Apportionment of the CTB using the VA factor

Once the value added by the different entities of a corporate group is calculated, how would the CTB be distributed using this VA factor? The following formula shows the tax base of a given group that would be allocated to jurisdiction i according to VA, TB_i^{VA} (i=1,...,I stands for all the jurisdictions where the group operates within the area covered by the formula):

$$TB_i^{VA} = CTB \left(\frac{VA_i}{\sum_i VA_i} \right)$$

The tax base accruing to jurisdiction i is therefore a share of the CTB of the group equal to the proportion that the value added by the company/ies of the group operating in that jurisdiction (VA_i) represents in the total VA of the group across all the jurisdictions where it operates ($\sum_i VA_i$) within the area covered by the formula.

Losses treatment by this formula: We consider briefly how this apportioning mechanism could treat the losses of a group in a given period in a given jurisdiction i. For a clearer understanding of the implications of application of the VA apportioning factor where a group makes a loss, we take the addition-based VA concept (VA = Labour compensation + Interests paid + Profits), just for explanatory purposes (although it has been argued that in practice this approach is not advisable).

If a group makes a loss in a country i in a given period, firstly these losses in jurisdiction i would be deducted in the first-step calculation of the CTB of the group, and then two cases could occur in the apportionment of this final CTB of the group:

1) The loss in i is less than the sum of labour compensation and interest paid by the group in that country i: in that case the VA in that jurisdiction is still *positive*. VA in i would be added to the VA in all other jurisdictions where the group operates (to calculate the denominator of the apportionment formula), and jurisdiction i would still get a positive share of the group's CTB, even if that was a non-profitable period for the business in that country.

2) Occasionally the group losses in a country in a given period may be larger than the sum of labour compensation and interest paid (by the group in that country and

period): in that case the value added by the group in that country and period is *negative*. How would the formula work in that case? One way of treating losses in this case is by not taking into account (not deducting) the negative VA in *i* in the calculation of total VA of the group, so that country *i* simply gets no share of the consolidated profits. Other solutions could, however, be envisaged.

Thus, putting down in words the rule in general terms: "*Only the VA* in those countries where the group generates *positive VA* enters into the calculation of *total VA* by the group and *only and all* countries where the group generates *positive VA* get a share in the CTB of the group".

The following numerical **examples** illustrate the three different scenarios that can occur when applying the VA apportionment formula: a) profits and positive VA in all jurisdictions; b) losses and positive VA in at least one jurisdiction (profits and positive VA everywhere else); c) losses and negative VA in at least one jurisdiction (profits and positive VA everywhere else). The relevant data for the group by member country (A, B and C) are described in the tables ⁽⁷³⁾, and calculations for distribution of the CTB are made according to the formulae and rules suggested above.

Case a) shows the standard functioning of apportionment according to VA: each of the tax jurisdictions where the group operates is attributed a fraction of the CTB of the group equal to the share that VA by the group in that jurisdiction represents in total VA at the group level. The tax jurisdictions will then apply their prevailing corporate tax rates to the corresponding apportioned tax base, and consequently the corporate income tax rate of the group will be a weighted average of the corporate income tax rates of the countries involved, with the shares of VA by the group in each country being the weights.

Case a) Profits and Positive VA in <i>all</i> jurisdictions where the group operates.				
Countries	A	B	C	Total
(a) Sales by origin (from A,B,C)	450	900	350	1700
(b) Labour Costs	45	250	50	345
(c) Interest Costs	5	50	0	55
(d) Other external costs (inputs)	240	300	200	740
(e) Depreciation	10	100	50	160
(f) Profits: (a)-(b)-(c)-(d)-(e)	150(37,5%)	200(50%)	50(12,5%)	400(100%) = CTB
Subtraction-based VA (a)-(d)-(e)	200	500	100	800
Addition-based VA (b)+(c)+(f)	200	500	100	800

⁽⁷³⁾ Some simplifying assumptions are adopted in the example, such as no variation of the raw materials and produced good stocks. Also, the *sales by origin* figure is meant to include exports and the *other external costs* figure (inputs) is meant to include imports.

VA-based apportionment of the CTB:				
$TB_i^{VA} = CTB \left(\frac{VA_i}{\sum_i VA_i} \right)$	$400 \left(\frac{200}{800} \right) = 100$	$400 \left(\frac{500}{800} \right) = 250$	$400 \left(\frac{100}{800} \right) = 50$	400
Shares of the CTB	$\frac{200}{800} = 25\%$	$\frac{500}{800} = 62,5\%$	$\frac{100}{800} = 12,5\%$	100%

Case b) shows a possible functioning of the VA apportionment where a group makes a loss in a particular country (C in the example, loss of 25). As the value added by the group is still positive in jurisdiction C (because the sum of labour and interest costs is larger than the loss), then that amount is aggregated to calculate total VA by the group and jurisdiction C would get a *positive share of the CTB*, despite the loss in that jurisdiction.

Case b) Losses and Positive VA in one of the jurisdictions where the group operates (C) (profits and positive VA everywhere else).				
Countries	A	B	C	Total
(a) Sales by origin (from A,B,C)	450	900	275	1625
(b) Labour Costs	45	250	50	345
(c) Interest Costs	5	50	0	55
(d) Other external costs (inputs)	240	300	200	740
(e) Depreciation	10	100	50	160
(f) Profits:				
(a)-(b)-(c)-(d)-(e)	150(46%)	200(61%)	-25(-7%)	325(100%) = CTB
Subtraction-based VA (a)-(d)-(e)	200	500	25	725
Addition-based VA (b)+(c)+(f)	200	500	25	725
VA-based apportionment of the CTB:				
$TB_i^{VA} = CTB \left(\frac{VA_i}{\sum_i VA_i} \right)$	$325 \left(\frac{200}{725} \right) = 89,66$	$325 \left(\frac{500}{725} \right) = 224,14$	$325 \left(\frac{25}{725} \right) = 11,2$	325
Shares of the CTB	$\frac{200}{725} = 27,6\%$	$\frac{500}{725} = 69\%$	$\frac{25}{725} = 3,4\%$	100%

Case c) shows a possible solution for the case in which a group generates negative VA in one of the jurisdictions where it operates (because the sum of labour and interest costs is not large enough to outweigh losses): negative VA in country C *is not taken into account to calculate total VA by the group, i.e. the denominator of the apportioning factor*, and as a result jurisdiction C simply gets no share in the CTB.

Case c) Losses and Negative VA in <i>one</i> of the jurisdictions where the group operates (C) (profits and positive VA everywhere else)				
Countries	A	B	C	Total
(a) Sales by origin (from A,B,C)	450	900	240	1590
(b) Labour Costs	45	250	15	310
(c) Interest Costs	5	50	0	55
(d) Other external costs (inputs)	240	300	200	740
(e) Depreciation	10	100	50	160
(f) Profits:				
(a)-(b)-(c)-(d)-(e)	150(46%)	200(61%)	-25(-7%)	325(100%) = CTB
Subtraction-based VA (a)-(d)-(e)	200	500	-10	690
Addition-based VA (b)+(c)+(f)	200	500	-10	690
(700 = $\sum_i VA_i^*$ for $VA_i^* > 0$)				
VA-based apportionment of the CTB:				
$TB_i^{VA} = CTB \left(\frac{VA_i}{\sum_i VA_i^*} \right)$	$325 \left(\frac{200}{700} \right) = 92,86$	$325 \left(\frac{500}{700} \right) = 232,14$	0	325
Shares of the CTB	$\frac{200}{700} = 28,6\%$	$\frac{500}{700} = 71,4\%$	0%	100%

- Could the same VA apportioning method be applied to all industries or economic sectors of EU corporate groups?

The answer to that question has to be seen from two viewpoints:

- On the one hand, VA is a theoretically consistent apportioning factor as the VA concept is always alike for all industries, no matter the production technology of companies. With a VA key it would not be necessary to adopt different formulae for particular industries, to reflect the relevance of particular factors to each industry. The VA approach corrects automatically for that, as the weighting adjustment of labour and capital factors is intrinsic to the VA-based mechanism. **Annex I** formally compares FA and VA in theoretical terms, and proves that factor weighting is endogenous in the VA method, thus there is no arbitrariness in choosing weights for the factors. The VA apportioning option thus avoids the extra burdens of defining and implementing industry-specific formulae.
- However, if a VA key for apportionment were to take as its starting point the EU's VAT system, there could be a problem of how to deal with sectors that are exempt or outside the scope of VAT. For example, the VA key would introduce the problem of how to distribute profits from the financial sector of the economy, which is currently

effectively excluded from parts of the European VAT system. VA for these sectors would have to be calculated "from scratch", as there is no VAT-based starting point for them.

(ii) Evaluation of the VA methodology in the light of the equity and efficiency criteria

Having described its main features, we discuss how the VA mechanism matches up to the equity and efficiency criteria.

Equity

A formula that intrinsically relies on profits, such as VA, guarantees that the apportionment of the CTB at least partially follows the 'true' source of income if this exists: all else being equal, jurisdictions in which the group is more profitable will receive larger shares of the CTB. A VA-based apportionment sources the origin of profits, which means that this is an apportioning mechanism that complies with the "equal earned income" principle of inter-nation horizontal equity, since jurisdictions in which the group earns the same total income receive equal shares of the group's CTB (all else being equal). Nevertheless, not all else is always equal. It can be said, in more general terms, that a VA key complies with the "equal earned income" approach to inter-nation equity only to a partial extent since, obviously, VA is not the same as profits anyway. Indeed, profits (plus interest costs) constitute typically the smallest portion of VA, since labour shares are around two thirds of VA in our economies ⁽⁷⁴⁾. That means that with a VA key, large shares of the EU groups' CTBs would be distributed according to the *labour* instead of the *profits* factor and the 'true' source of income (assuming it is associated with the location where profits are realized) can be only partially traced by this allocation mechanism. Hence, for example, if labour intensity and profitability of businesses varies across sectors (ie their respective shares in VA vary for different sectors), as it does, the VA-based apportionment might lead to different results in the accuracy of seeking the 'true' source of income in the different sectors.

At any rate, the profit-based nature of the VA key is useful insofar as it helps to solve some of the questions about the delineation of the CTB. These are the issues in which the delineation of the CTB relates to inter-nation equity concerns, in particular when the "equal earned income" approach matters:

* If a VA approach is used to apportion income the potential problem of merging all types of income in the CTB is alleviated: the reason is that if theoretically "non-apportionable income" (that is, income perfectly linked to a location) is included in the CTB, a VA key will apportion it, at least partially, according to where this income has truly arisen (because the measure of VA in a jurisdiction relies on *profits* earned in that jurisdiction). By using a VA key, therefore, advocates of an "equal earned income"

⁽⁷⁴⁾ Daudey (2003) shows that the average labour share of value added at the macroeconomic level ranged from 50% to 72% for OECD countries in 2002, depending on the definition of value added (at factor costs or market price) and the scope for adjusting for non-salaried workers. Calculations are based on "OECD Economic Outlook Statistics and Projections" (2002), No 72: OECD publications.

approach to inter-nation equity can feel less uncomfortable when adding income connected to a location to the CTB, because in the second part of the procedure the apportioning method will take care of attributing that income to the jurisdiction where it truly originated.

* A VA approach could also cope well with concern about the "unfairness" of the legal definition of the group. One of the main weaknesses of defining the group in legal terms is that consolidation of income of economically unrelated entities could lead to 'misattribution' of profits (with respect to the "equal earned income" approach to inter-nation equity) if a formula based on factors (such as FA) was used for apportionment. The cause is that the income from affiliated (but perhaps economically unrelated) enterprises would be sourced by reference to apportionment factors that might not have contributed to the production of the taxable income in question ⁽⁷⁵⁾. As a profit-based apportioning factor, VA at least partly resolves the potential problem of a legal definition of the group, because it attributes the CTB to where profits have been truly earned (at least to some extent). So, VA-based apportionment could probably be a good complement to a *legal*, rather than an economic approach of the consolidated group, if the "equal earned income" principle for inter-nation equity matters.

Efficiency

- Neutrality: The effects of VA apportionment on economic agents' behaviour has not been studied so far in detail and research in this field should be conducted.

One exception is the work of Mintz (2004), who shows that under an origin-based VA apportionment formula, and debt-financed investment, C+A could result in greater distortion of capital allocation compared with the SA method. The analysis hinges on the idea that, with debt-financed investment, an origin-based VA-apportionment distorts the cost of capital as long as corporate tax rates vary by jurisdiction. The distortion is such that a jurisdiction with a corporate income tax rate that is lower than the average corporate tax rate faced by the MNE ⁽⁷⁶⁾ would have a cost of capital below the normal rate of return by investors (which would be the cost of capital faced by the MNE everywhere in a SA situation, assuming fully debt-financed investment), since rents are taxed a lower rate in the jurisdiction. Thus, C+A that affects the cost of capital by jurisdiction results in distortions in the allocation of investment by countries and, under

⁽⁷⁵⁾ For example, if a parent corporation owns an unprofitable subsidiary in MS B and a profitable subsidiary in MS C, and the business operations of the two subsidiaries had no connection with one another (apart from common ownership), basing apportionment on supply factors would result in attributing profits from the profitable subsidiary in MS C to MS B, where the group is actually unprofitable. This shows that traditional FA does not comply with an "equal earned income" approach to inter-nation equity (although it complies with an "equal capacity to earn income" view). This result of the mere legal definition of the group would not be so dramatic if a profit-based apportioning mechanism such as VA was used to apportion consolidated income, because profits would be partially attributed to where they have truly arisen.

⁽⁷⁶⁾ That is, the weighted average of corporate tax rates of the jurisdictions in which a group operates, with the weights given by the shares of local to total VA.

the model's conditions, VA-based apportionment introduces non neutralities to the firms' decisions ⁽⁷⁷⁾.

Other effects of VA-apportionment can be stated straight away. On the one hand, it has been mentioned earlier that an income-type VA potentially used for apportionment would be defined as wage payments plus the return to capital (net of depreciation). If, as it is recognised in literature, apportionment converts the corporate income tax into a tax on the factors included in the apportioning mechanism, it can thus be said that taxation of consolidated corporate income with VA apportionment is equivalent to a uniform payroll tax plus an equal rate profits tax (with depreciation provisions but no deductibility of interest). So this formula could actually be seen as largely transforming corporate income tax into a tax on labour (labour shares are around 2/3 of VA), which is unlikely to be an acceptable idea and would not be consistent with certain other Community policies ⁽⁷⁸⁾.

On the other hand, several arguments point at the possible conclusion that apportionment based on VA is unlikely to encourage tax competition between governments to attract real activities of businesses. First, at least insofar as negative economic shocks (losses) might mean no revenue for governments under VA-apportionment, governments have less incentives to attract investment into their territories than under traditional FA (unlike traditional FA, it has been shown that if losses by a group member in a territory are large enough to offset wages and interest costs -ie, if VA is *negative*- the relevant jurisdiction might get no share of the group's CTB). Also, VA apportionment does not rely directly on highly mobile factors (e.g. capital investment), thus probably limiting the scope for governments' success in increasing their revenues by attracting investment into their territories.

- Enforceability/Tax Planning: Like any profit-based formula, VA measured on an origin bases is sensitive to arm's length manipulation for the purpose of profit shifting and in consequence VA apportionment may also prompt tax competition for shift profits by governments. *Annex II* proves formally that the amount of VA in each territory could technically be subject to manipulation to shift the allocation of profits across jurisdictions for tax-reducing purposes. Hence, with a VA key the *transfer pricing* issue re-emerges explicitly. Companies have an incentive to manipulate their intra-group transfer prices so as to influence their VA shares between Member States and therefore, their shares of consolidated taxable income allocated to each jurisdiction. Their strategy to minimise the tax burden would be to allocate a higher share of their VA to the low corporate income tax countries, so reducing the final corporate income tax burden. Thus, the VA-based apportioning mechanism may invite tax planning and transfer pricing abuses of the kind that currently exist under SA corporate income tax systems.

⁽⁷⁷⁾ However the analysis is valid only for the case in which investment is fully financed by debt, because without debt finance (ie, with equity finance) the cost of capital under the VA factor method is the same as under the SA principle and in both cases differs from the normal ongoing rate of return, as it is affected by the local corporate tax rate.

⁽⁷⁸⁾ The final *incidence* of such payroll tax (ie, whether it increases the costs of labour to the firms –thus it is actually borne by the demand side of the labour market- or decreases the wages earned by workers by the amount of the tax – thus, it is actually borne by the supply side) depends on the respective elasticities of the demand/supply curves of the labour markets.

This is certainly one of the most important problems facing a VA apportioning key, although the extent of the problem is not as important as under the actual arm's length pricing regime, for at least two reasons, developed below.

* First, using VA to apportion income eliminates current profit-shifting incentives *through the financing of subsidiaries by debt or equity*: financing a subsidiary in a given country by one or the other source would not affect VA there (since VA includes both interest costs and profits) and so distribution of the total group tax base would not change by changing the associated companies' financial structure. The "thin capitalisation" question becomes much less relevant.

* Secondly, although VA in a location can be affected by transfer pricing strategies for intra-group non-financial transactions, the size of the VA base is larger than profits, as it also relies on labour and interest costs in all jurisdictions where the group operates. It can be proved that if one unit of profits (and VA) is shifted from one jurisdiction to another (by means of transfer pricing manipulations in transactions between associated firms) then the amount of the CTB that ends up being transferred from one jurisdiction to the other is less than one unit: the share of that unit that would be shifted as tax base across

jurisdictions is the same percentage that profits represent in VA at a group level $\left(\frac{\sum_i \Pi_i}{\sum_i VA_i} \right)$,

which is certainly **less than one** ⁽⁷⁹⁾. In other words, the scale of the price manipulation has to be several times larger to achieve the effect of shifting one unit of the CTB, and therefore the size of the problem is much more limited than under current arm's length pricing (under SA, one unit of the tax base would move following one unit profit shifting through, for example, transfer pricing manipulation). In most cases it would be difficult to achieve a significant effect on shifting the CTB under VA apportionment.

The larger the proportion that profits represent in VA at a group level, the more important is the transfer pricing problem associated with the VA-key for apportionment. On the other hand, the two other factors in VA, labour and interest costs, function (in the denominator) as a brake on this form of abuse. This is one of the main reasons why the labour factor should be kept in a VA concept used for apportionment purposes. Excluding labour costs from VA would magnify the incentive to manipulate transfer prices ⁽⁸⁰⁾, especially since labour costs may be the largest component of the companies' VA. A numerical example illustrates all the above reasoning in *Annex III*.

In conclusion, using VA to apportion the income of the group re-introduces some transfer pricing incentives to strategically allocate the tax base of the group across countries so as to minimise the corporate income tax burden. However, because of the way the apportioning VA mechanism works, this incentive is much more limited than under current SA. But in order to minimise the potential problem labour costs should not

⁽⁷⁹⁾ As discussed earlier, since labour shares represent around 2/3 of VA, this fraction of total profits/total VA can be estimated around 0,3.

⁽⁸⁰⁾ Profits would represent a much larger share of a VA concept excluding labour costs, and so a much larger percentage of the potential profit shifting would effectively be "tax base" shifting. See Hellerstein and McLure (2004) p 215 for the same sort of reasoning.

be excluded from the VA base. Under that premise the VA base for the group is between four to seven times larger than total profits, so any fictitious manipulation might be too costly for the enterprise and easy to discover by tax authorities.

- Simplicity and Cost Effectiveness: Several issues can be considered to evaluate the simplicity and cost-effectiveness of the VA apportionment option:

* On the one hand it is not clear whether a VA method would substantially reduce the compliance costs currently associated with transfer pricing. It has been recognised that the transfer pricing problems remaining under the VA system are less important than under arm's length principles because the incentives to manipulation are much more limited. This may mean that in practice it would not be necessary to apply in full all the complicated and burdensome compliance rules and transfer pricing obligations currently in place. Simpler rules could be used, the compliance burden eased and monitoring simplified as the risk of discovery is higher: thus, in general, compliance costs would actually be reduced. On the other hand, the practical implications for transfer pricing obligations might not be so different between an "important" and a "less important" problem (that is, between SA and "consolidation + VA apportionment"), as multinationals would still have to keep fulfilling their transfer pricing obligations and tax administrations would still have to monitor them. So from the latter standpoint the VA option is simply self-defeating because it negates one of the main arguments of the whole reform, which is the reduction of transfer pricing-related compliance and administrative costs.

* The concept of VA is very familiar to firms and administrations within the EU and thus it can be easily implemented. VA could minimise the costs of data collection, because the VA key could work with data already collected and reported for the EU VAT system (at least in the sectors currently within the scope of VAT), so reducing the combined compliance costs (for VAT and corporate taxation). For example, in order to reconstruct the VA apportionment factor for corporate income taxation of a given group from the VAT liabilities, the following data would be required:

- VAT payments of a given group in each MS
- Total sales (exports and intra-group sales included) in each MS
- Total purchases (imports and intra-group purchases included) in each MS
- Tax rates applicable in each MS
- Percentage of sales at the different rates applicable in each MS
- Percentage of purchases at the different rates applicable in each MS
- Turnover of the group in transactions outside the scope or exempted from VAT
- Capital investments and depreciation of the group in each MS.

This description highlights that VA is not as simple as it initially seemed in terms of data collection, because calculation of VA for apportionment requires a lot of adjustments to data prepared for VAT returns.

At any rate, if the above calculation from VAT returns seems far too complicated, a calculation 'from scratch' of the subtraction-based VA could be envisaged, that could be

applied to all economic sectors. In that case, the data requirements for each group member are the following:

- Sales ⁽⁸¹⁾ *by origin* in each MS (domestic + exports), including intra-group sales.
- Purchases in each MS (domestic + imports), including intra-group purchases ⁽⁸²⁾.
- Initial and final stock of produced inventory in each MS.
- Initial and final stock of inputs in each MS.
- Depreciation of capital stock.

* Lastly, from another point of view, the VA-based apportioning mechanism is fairly simple and transparent in solving easily some of the basic issues regarding the factors' choice, valuation and weighting and the industry-specific adjustment of the formula (VA apportionment solves for all that *endogenously*). Income from intangibles is included in VA and this mechanism avoids the difficulties of *intangible property* valuation.

The following table summarises the appraisal of VA in the light of the tax policy objectives considered.

Assessment of apportionment based on a VA key

Equity		Efficiency		
		Neutrality	Enforceability/ Tax planning	Simplicity / Cost Effectiveness
"Equal earned income"	••			
"Equal capacity to earn income"	••	••	•	••
"Benefit principle"	••			

In summary, using VA at origin as an apportioning mechanism would have the strong theoretical appeal that since VA relies on profits, a VA key would distribute profits according to where they are generated (at least partially and in a subtraction-based calculation, without the need to calculate profits explicitly by location), thus complying (to a certain extent, because there are other factors than profits in the definition of VA) with an "equal earned income" approach to inter-nation equity in apportionment. Also, the VA concept is very familiar to taxpayers and tax administrations in the EU, and the adjustments needed to move from the current VAT base to a VA apportioning factor are not insurmountable. VA also would avoid using different formulae for different industries, because it is a consistent concept for all economic sectors. And it could be a better complement to "less refined" and simpler definitions of the group (legal definition) and of the CTB (incorporating both business and non-business income), because it would (partially) solve the 'misallocation' concerns arising from the use of those unsophisticated definitions. However it has two important drawbacks that might tilt the balance against this option: because of the profit-shifting incentives introduced through the

⁽⁸¹⁾ Doubts may arise as to whether non-business revenues should be included in *sales by origin*, i.e. dividends, interests received, proceeds from the sales of assets, etc.

⁽⁸²⁾ The profit-shifting opportunities and the need to maintain transfer pricing monitoring under the VA approach become apparent precisely due to the requirements of valuing intra-group sales and intra-group purchases at this point for any of these calculations.

apportionment formula, it reintroduces the need to value all intra-EU intra-group transactions (which is one of the main issues the whole reform tries to avoid) and it places a heavy weight on labour that might be unacceptable because this would conflict with other Community policies.

V. CONCLUSIONS

This analysis has described and discussed the main problems encountered in the reflections on designing an EU C+A system for multi-jurisdictional groups' corporate taxation. The result seems to be that both the delineation and apportionment of an EU CTB continuously encounters important technical and political difficulties. However, it should not be forgotten that the fact that the proposed reform has difficulties for its implementation does not necessarily imply that the current system (based on SA) does not have them as well. SA dis-aggregation by MS of the income earned by commonly controlled corporations engaged in integrated cross-border activity is too complex, too costly and even meaningless. SA could equally have been reviewed in the context of the same tax principles analysed here and found equally problematic in many aspects, but that was *not* the purpose of this paper. It should also be noted that despite difficulties, even the imperfect US FA system seems to work to the satisfaction of all players and many of the problems identified in this paper refer only to relatively complex and presumably rare and therefore perhaps less important situations. And indeed, although the formulary method used in the US is complicated and has its flaws, there are few, if any, calls to replace formulary apportionment with separate accounting at the state level. The Canadian experience also shows overall that the apportionment system in place there performs reasonably well.

As our analysis has shown, it could be also argued that in a C+A system in the EU there could be several important potential reasons why arm's length pricing practices would have to be maintained anyway, for example: (i) for valuing intra-group transactions with affiliates outside the EU (or outside the area covered by the formula) and transactions with affiliates controlled by the parent(s) but left outside the consolidated group; (ii) for splitting income across different lines of business of a given group if industry-specific formulae were agreed to divide groups' income under an FA approach; (iii) for splitting income between majority/minority shareholders if not all income of less-than-100% owned income was accrued to the CTB; iv) it would be necessary to apportion based on VA at origin, etc. But in principle, there is nothing wrong with using both C+A and arm's length practices at the same time, as long as the scope to which each system should be applied is clearly determined. Replacing SA by C+A for the enormous amount of intra-EU intra-groups' transactions would already be a great step forward in reducing EU groups' compliance costs, even if arm's length pricing has to be kept simultaneously in limited circumstances.

For a general assessment of the C+A methodology *versus* SA, one should distinguish between problems that arise specifically in C+A *versus* SA and problems not solved by C+A *versus* SA. For example, the "factor shifting" incentives and its distortionary effects are specific problems of an FA apportioning method that would have

to be resolved when designing a potential FA mechanism and that do not exist in SA. But there are other problems (such as shifting income to related entities in other countries, or to affiliates outside of the group, etc) which already exist under the SA system anyway. So, C+A does not introduce a new "income shifting" incentive, it simply does not completely solve the existing one (mainly because of its limited application). So, the treatment of these problems in the new system should simply follow existing practices, i.e. continued application of transfer pricing rules for transactions with affiliates, but limited to those outside the group (unlike today where all transactions with all affiliates require attention).

At this stage it is also important to remember that the efficiency gains of the reform come mainly from the existence of a single consolidated tax base, namely: allowing cross-border loss offsets in calculating the CTB, reducing compliance costs for companies, which would not have to deal with many different national tax systems or to comply with transfer pricing obligations (intra-EU intra-group transactions are eliminated when calculating the CTB), reducing the risk of double taxation, etc. It is clear, for example, that dealing with only one set of rules, for enterprises with EU-wide activities, is a major simplification and efficiency gain. Thus the convenience of a single and consolidated corporate tax base is still acknowledged and endorsed, as businesses become increasingly integrated in their operations at the international level. But consolidation necessitates apportionment, a distribution of income through some "rough" estimate across tax jurisdictions. The apportionment system is just the complement of the CTB, the way of allocating profits: its design should not be expected to introduce *additional* arguments reinforcing a move from SA and it should be appraised with this in mind. The real role of the apportioning mechanism in the reform should therefore be something that allows a "reasonable" distribution of taxable profits across taxing jurisdictions and that does not reintroduce the problems we want to resolve in the first instance. If "consolidation" is one step forward, "apportionment" should not be two steps backwards in the area of multi-jurisdictional corporate taxation.

The competing methodologies for apportionment have been assessed systematically with respect to some of the underlying objectives they are meant to accomplish. The following table summarises the relative merits of the different mechanisms analysed as means of distributing potential EU CTBs of multinational groups among States.

As expected, the conclusion is that there is no such thing as a "perfect" mechanism. No system can achieve all the above objectives. The table highlights that the choice of an apportionment method is one more example of the equity-efficiency trade-off inherent in most tax problems (and in public sector economics problems in general). Whereas the micro-approaches (FA and VA) deal better with inter-nation equity principles, the macro factors are much more suited to the pursuit of efficiency. This is telling us that what is really important in this process is to achieve some reasonable agreement among the participant members on the basic priorities desired for the tax system: which tax principles they consider essential and which principles they are willing to sacrifice. For example, a political preference for an equitable apportioning system based on an "equal earned income" approach would perhaps point to the use of a VA key,

whereas a strong preference for efficiency could lead to a macro-apportionment factor. However, as Einstein's aphorism warns "things should be made as simple as possible, but no simpler" and macro apportionment factors could be a way of simplifying matters too quickly and too much. Thus, the valuation of the different formulae should be done according to the 'ranking' of the most desirable tax policy objectives to be achieved.

Summary Table	Macro factor	FA	VA-key
Equity			
"Equal earned income"	•	•	••
"Equal capacity to earn income"	•	•••	••
"Benefit principle"	•	•••	••
Efficiency			
Neutrality	•••	•	••
Enforceability/Tax planning	••• •	••	•
Simplicity /Cost Effectiveness	•••	••	••

ANNEX I

The comparison between FA and VA as apportioning methods

We compare here in theoretical terms the implications of using a formula based on factors (FA) or on VA as apportioning rules.

For a better understanding of its implications, we assume the addition-based definition of VA (even though that specific definition should not be the one used in practical terms as argued in the text). Using that definition, the formula that shows the *tax base* accruing to jurisdiction i when VA is used to apportion income, TB_i^{VA} , can be decomposed in the following way:

$$(1) \quad TB_i^{VA} = CTB \left(\frac{VA_i}{\sum_i VA_i} \right) = CTB \left(\frac{w_i L_i}{\sum_i VA_i} + \frac{r_i I_i}{\sum_i VA_i} + \frac{\Pi_i}{\sum_i VA_i} \right)$$

The VA apportioning mechanism distributes the group income according to three underlying factors: labour costs, interest costs and profits, and these three factors are weighted in each jurisdiction according to their importance in total VA by the group (ie, VA in all jurisdictions where the group operates in the area covered by the formula).

In turn, the traditional three-factor FA approach distributes the CTB according to the following expression (TB_i^{FA}):

$$(2) \quad TB_i^{FA} = CTB \left(\alpha \frac{w_i L_i}{\sum_i w_i L_i} + \beta \frac{K_i}{\sum_i K_i} + \gamma \frac{S_i}{\sum_i S_i} \right) \quad (\alpha + \beta + \gamma = 1)$$

K_i stands for capital (property) in jurisdiction i, S_i is sales (gross receipts) into that jurisdiction. $\sum_i w_i L_i$ is total employee compensation, $\sum_i K_i$ is total capital and $\sum_i S_i$ is total sales, the last three at group level (in all jurisdictions where the group operates within the area covered by the formula). α , β and γ are the weights of each of the factors, such that $\alpha + \beta + \gamma = 1$.

By comparing (1) and (2) one can see that the FA and VA apportionment mechanisms rely on slightly similar factors to account for the source of income in the numerator:

- With respect to the labour factor, *labour compensation* enters both formulae.

- Regarding the capital factor, whereas the FA takes into account the *value of capital stock*, the VA approach instead relies on the *flows of capital* – borrowing costs ⁽⁸³⁾ – (in a given year).
- Lastly, whereas traditional FA uses *sales by destination* (gross receipts) as a third factor, VA relies on *profits*.

The way of weighting these factors however, is different in the two approaches (the denominators):

- In FA each of the factors (*payroll-capital-sales by destination*) is compared to the same factor at a group level, so as to give an estimation of business in one country relative to group total activities. And then these local-to-total ratios are weighted arbitrarily (α , β and γ are arbitrary numbers, that add up to 1 so as to ensure that if all countries use the same formula there is no double taxation or non-taxation).
- In VA, however, any of the three *payroll-interest cost-profit* factors of a group in a country are compared to total VA by the whole group. And the weight of those factors in the VA apportionment mechanism varies according to the importance of each factor in production, instead of being arbitrary and fixed as in FA. Factor weighting is *endogenous* in the VA method. One could see that by manipulating (1) in the following way:

$$(3) TB_i^{VA} = CTB \left(\frac{w_i L_i}{\sum_i w_i L_i} \frac{\sum_i w_i L_i}{\sum_i VA_i} + \frac{r_i I_i}{\sum_i r_i I_i} \frac{\sum_i r_i I_i}{\sum_i VA_i} + \frac{\Pi_i}{\sum_i \Pi_i} \frac{\sum_i \Pi_i}{\sum_i VA_i} \right) = CTB \left(\frac{w_i L_i}{\sum_i w_i L_i} \alpha + \frac{r_i I_i}{\sum_i r_i I_i} \beta + \frac{\Pi_i}{\sum_i \Pi_i} \gamma \right)$$

$$\text{where } \alpha = \frac{\sum_i w_i L_i}{\sum_i VA_i}, \beta = \frac{\sum_i r_i I_i}{\sum_i VA_i}, \gamma = \frac{\sum_i \Pi_i}{\sum_i VA_i}$$

Therefore, in the VA apportionment there is an endogenous weighting of the *local to total* apportioning factors, with the weights, α , β , γ , given by the importance of each factor (labour, debt-financed capital, equity capital) in the corporate group total VA and adding up to 1.

⁽⁸³⁾ And *return to equity*, although just for exposition purposes we consider profits as the *third* factor, instead of being part of the second *capital* factor strictly.

ANNEX II

VA and transfer pricing manipulation for tax reduction purposes

As a matter of fact, the use of VA as a practical methodology for allocating profits internationally offers multinationals the opportunity to use pricing policies to shift profits and with them shift VA between jurisdictions. A VA-based mechanism provides an incentive for colluding firms, e.g. subsidiaries of a multinational firm, to shift VA to low corporate income tax countries in order to reduce the total corporate income tax burden for the group. We prove that formally below.

To analyse the incentive for transfer pricing in the VA approach we consider a multinational firm operating in country A with a subsidiary in country B. The firm's objective is to minimise total tax burden, regardless of the country taxes are paid in. The two countries tax profits at rates t^A and t^B respectively. The parent company produces in country A X units of the final output, which is sold at its market price p_x per unit. X is produced by means of domestic primary inputs (with a price K_x per unit of output produced) and an intermediate input I which is imported from its subsidiary in B at a price p_I per unit of the input good. The subsidiary produces the intermediate input good at a cost K_I per unit.

Under this description of the situation, we calculate first the subtraction-based VA in each country by the multinational:

(1) Value Added in A: $VA^A = p_x X - K_x X - p_I I$

(2) Value Added in B: $VA^B = p_I I - K_I I$

And thereby *total value added* by the group amounts to:

(3) Value Added in A+B: $VA^A + VA^B = p_x X - K_x X - K_I I$

Once the CTB is determined, basing its apportionment on VA yields the following results for determining the corporate income tax burden in each country where the group operates:

(4) Corporate Income Tax Burden in A: $T^A = t^A \left(\frac{VA^A}{VA^A + VA^B} \right) CTB$

(5) Corporate Income Tax Burden in B: $T^B = t^B \left(\frac{VA^B}{VA^A + VA^B} \right) CTB$

And total corporate income tax burden for the group amounts to:

(6) Total Corporate Income Tax Burden in A+B:

$$T = T^A + T^B = (t^A VA^A + t^B VA^B) \left(\frac{CTB}{VA^A + VA^B} \right)$$

And substituting out VA^A (1) and VA^B (2) and $VA^A + VA^B$ (3) into (6), the total tax burden can also be expressed in this way:

(7) $T = [t^A (p_x X - K_x X - p_I I) + t^B (p_I I - K_I I)] \left(\frac{CTB}{p_x X - K_x X - K_I I} \right)$ or

$$T = t^A (p_x - K_x) X - t^B K_I I + (t^B - t^A) p_I I \left(\frac{CTB}{p_x X - K_x X - K_I I} \right)$$

(7) is the expression we are interested in: it can be seen from it that T, the total tax burden of the group, explicitly depends on p_I , the transfer price of the intermediate input traded intra-group. So, unless $t^A = t^B$, there will be an incentive for strategic transfer pricing. The incentive is such that if $t^A > t^B$, then so as to minimise the total tax burden, transfer pricing of the intermediate good would tend to be overstated ($\uparrow p_I$) to shift profits (and therefore VA) from the high A to the low B tax jurisdiction; on the other hand, if $t^B > t^A$, then minimisation of the total tax burden implies that transfer pricing would tend to be understated ($\downarrow p_I$) to shift profits from the high B to the low A tax jurisdiction. Equation (7) therefore reveals the transfer price incentive, since firms reduce their final corporate income tax burden by over-invoicing intermediate goods imported from affiliates firms in low corporate income tax countries ($t^A > t^B$) or by under-invoicing those goods imported from affiliates established in high corporate income tax countries ($t^B > t^A$).

ANNEX III

VA and profit-shifting incentives: the role of labour costs

The **example** below shows the apportionment of the CTB of a group that operates in two countries, A and B. For the sake of simplification we consider that the CTB coincides with the sum of profits across all these territories. The relevant data for the group are described by country in the tables. In Table **a)** addition-based VA is calculated *with and without labour costs* and apportionment of the CTB is computed for both ways of calculating VA, under the assumption that there is no manipulation of transfer prices.

<i>Table a) No manipulation of transfer prices</i>			
Countries	A	B	Total
Labour Costs ($w_i L_i$)	70	90	160
Interests Costs	10	20	30
Profits	20	40	60 = CTB
Addition-based VA	100	150	$250 = \sum_i VA_i$
Value Added-Labour Costs	30	60	$90 = \sum_i VA_i - w_i L_i$

Apportionment of the CTB using VA:			
$TB_i^{VA} = CTB \left(\frac{VA_i}{\sum_i VA_i} \right)$	$60 \left(\frac{100}{250} \right) = 24$	$60 \left(\frac{150}{250} \right) = 36$	60
Shares of the CTB	$\frac{100}{250} = 40\%$	$\frac{150}{250} = 60\%$	100%

Apportionment of the CTB using VA-Labour Costs:			
$TB_i^{VA} = CTB \left(\frac{VA_i - w_i L_i}{\sum_i (VA_i - w_i L_i)} \right)$	$60 \left(\frac{30}{90} \right) = 20$	$60 \left(\frac{60}{90} \right) = 40$	60
Shares of the CTB	$\frac{30}{90} = 33,3\%$	$\frac{60}{90} = 66,7\%$	100%

Through the computations in Table **b)** we analyse the effects of strategic transfer pricing and profit shifting on the apportionment of the CTB. Suppose that country A has a lower corporate income tax rate than B ($t^A < t^B$) and that the group shifts one unit of profits to jurisdiction A through strategic transfer pricing, trying to minimise its total tax burden (i.e. in Table **b)**, the **Profits** figures show one extra unit in country A and

simultaneously one unit less in country B, compared to the original case in *Table a*). After apportioning the CTB using VA (labour costs included) it can be seen that following the one unit profit shifting, only 0,24 units of the CTB has been actually shifted to country A. Indeed, 24% is the percentage of total profits on VA at the group level: $\frac{60}{250} = 24\%$. So, the tax base in A has increased by 0,24 units, and the tax base in B has decreased by the same amount ($\Delta TB_A = 24,24 - 20 = 0,24$; $\nabla TB_B = 36 - 35,76 = 0,24$). The scale of the transfer pricing problem with VA apportionment is obviously much more limited than under separate accounting.

In turn, we compute the effects of profit shifting on the distribution of the CTB where a VA notion excluding labour costs is used to apportion income. In that case the example reveals that following the one unit profit shifting, 0,67 units of the CTB has been actually shifted to country A. 67% is the percentage that total profits represent in the VA excluding labour costs at group level: $\frac{60}{90} = 0,67$. So, after one unit profit shifting towards country A the tax base in A has increased by 0,67 units, and the tax base in B has decreased by the same amount ($\Delta TB_A = 20,67 - 20 = 0,67$; $\nabla TB_B = 40 - 39,33 = 0,67$). The scale of the transfer pricing problem is much larger in this case than when VA including labour costs is used to apportion income.

Table b) Manipulation of transfer prices: ($\Delta \text{Profits}^A = 1$; $\nabla \text{Profits}^B = 1$):			
Countries	A	B	Total
Labour Costs ($w_i L_i$)	70	90	160
Interests Costs	10	20	30
Profits	21	39	60 = CTB
Addition-based VA	101	149	$250 = \sum_i VA_i$
Value Added-Labour Costs	31	59	$90 = \sum_i VA_i - w_i L_i$
Apportionment of the CTB using VA:			
$TB_i^{VA} = CTB \left(\frac{VA_i}{\sum_i VA_i} \right)$	$60 \left(\frac{101}{250} \right) = 24,24$	$60 \left(\frac{149}{250} \right) = 35,76$	60
Shares of the CTB	$\frac{101}{250} = 40,4\%$	$\frac{149}{250} = 59,6\%$	100%
Apportionment of the CTB using VA-Labour Costs:			
$TB_i^{VA} = CTB \left(\frac{VA_i - w_i L_i}{\sum_i (VA_i - w_i L_i)} \right)$	$60 \left(\frac{31}{90} \right) = 20,67$	$60 \left(\frac{59}{90} \right) = 39,33$	60
Shares of the CTB	$\frac{31}{90} = 34,4\%$	$\frac{59}{90} = 65,6\%$	100%

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