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Working Paper

Proposals for a European corporate taxation and their influence on multinationals' tax planning

arqus Discussion Paper, No. 54

Provided in Cooperation with:

arqus - Working Group in Quantitative Tax Research

Suggested Citation: Sureth, Caren; Üffing, Michaela (2008) : Proposals for a European corporate taxation and their influence on multinationals' tax planning, arqus Discussion Paper, No. 54, Arbeitskreis Quantitative Steuerlehre (arqus), Berlin

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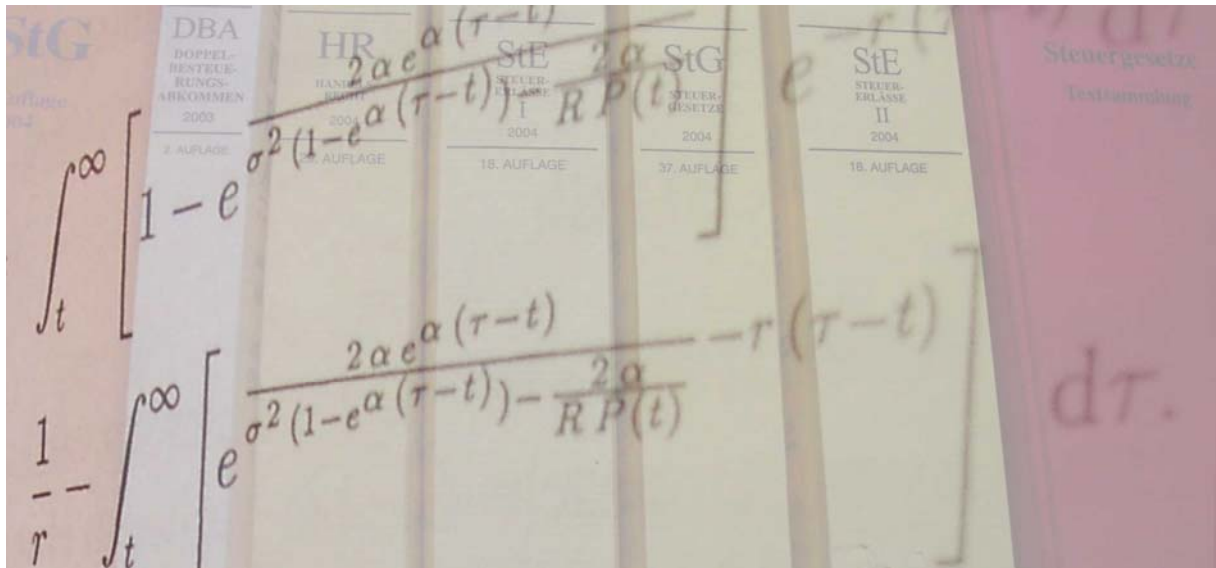
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Diskussionsbeitrag Nr. 54

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September 2008

arqus Diskussionsbeiträge zur Quantitativen Steuerlehre
arqus Discussion Papers in Quantitative Tax Research
ISSN 1861-8944

**Proposals for a European Corporate Taxation
and their Influence on Multinationals' Tax Planning**

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Proposals for a European Corporate Taxation and their Influence on Multinationals' Tax Planning

1 Introduction

The European Commission is currently discussing a reform of profit taxation for multinational corporations operating in the European Union (EU). The intention is to come closer to a harmonized European domestic market. The academic and political discourse mainly focuses on the concept of the Common Consolidated Corporate Tax Base (CCCTB). On the political level a team of experts chosen by the EU Commission is investigating special issues of CCCTB. CCCTB is considered the long-term comprehensive solution for eliminating the obstacles faced by multinational corporations operating in the European single market.¹ Since full details of the proposed CCCTB are not available at present, only the fundamental outline of the concept is known, whereas major aspects (e.g., determination of the tax base, classification of the companies to be consolidated, allocation factor) remain unspecified.

There is a vast body of literature on CCCTB. Numerous descriptive and comparative analyses illustrate the advantages and disadvantages of CCCTB (e.g., Cerioni, 2006; Plaesschaert, 2005; Mintz and Weiner, 2003; Sørensen, 2004; Weiner, 2002; Giannini, 2002). Further contributions concentrate on a significant component of CCCTB that has not yet been detailed: the allocation factor of the consolidated profit of the respective Member States ("formula apportionment").

Formula apportionment (FA) became a part of US tax law in the early 20th century (Ford, 1930; Hellerstein, 1968; Hellerstein and McLure, 2004), so several academically and practically orientated papers particularly in US literature have been written and contributed to the general debate since the 1960s (e.g. Gordon and Wilson, 1986; Musgrave, 1984; Hellerstein, 1968). Based on these experiences many recommendations for the allocation factor have been

¹ Cf. European Commission, 2006a.

made, for example by Hellerstein/McLure (2004) for implementing a US-style enterprise tax law system in the EU. US tax law includes the factors payroll, property and sales, whereas Canadian tax law comprises the factors payroll and sales. Several studies deal with distortions caused by a different weighting of these factors (e.g. McLure, 1980; Goolsbee and Maydew, 2000; Gordon and Wilson, 1986; Anand and Sansing, 2000; Nielsen et al., 2001). In consideration of company taxation developments in the EU, research focuses on the activities of the European Commission and their possible implications. In this context a number of authors focus on the definition of FA (e.g. Mintz, 2008, Schreiber 2008, Spengel 2008, Wellisch, 2004; Eggert and Schjelderup, 2003). Other analyses focus on loss offset under CCCTB (e.g. Weiner and Gérard, 2003) and the effects of implementing CCCTB in the EU (e.g. Raventós-Calvo and de Juan y Penalosa, 2002).

International Financial Reporting Standards (IFRS) are likely to be used as starting point for CCCTB. Against this background Oestreicher and Spengel (2007) investigate which elements of IFRS can be integrated to meet the requirements of CCCTB and how the application of IFRS can influence the effective tax burden of companies in selected EU Member States. Using the European tax analyzer Jacobs et al. (2005) evaluate and compare the effects of CCCTB under IFRS on the effective tax burden of 13 Member States. They find the introduction of IFRS to have a significant impact on the effective tax burden in the participating countries compared to the current differences that exist throughout the EU. Further, IFRS only lead to a marginal increase in the effective tax burden. Thus, an economic analysis identifying possible tax incentives and in turn, possible distortions of CCCTB based on effective average tax rates has already been performed. Similar effects were obtained by Eberhartinger and Klostermann (2007) who study empirically the potential tax effects of using IFRS as the basis for national corporate taxation. Their evidence suggests that no dramatic change in the tax base is to be expected. Furthermore, Fuest et al. (2006) analyze the budgetary consequences of an EU-wide common tax base and investigate the effects of allocation to the EU Member States

using data provided by the German Central Bank. Kieseletter (2005) or Kieseletter and Mugler (2007) refer to the possibility of influencing the tax burden from CCTB. Whereas CCCTB sacrifices part of the Member States' autonomy an EU-wide tax system that maintains both financial and tax autonomy can be an attractive alternative for the transnational taxation of multinational corporations. The European Tax Allocation System (ETAS) is such a tax system (European Commission (2003), p. 10; Hernler (2003, 2004a, 2004b)). Despite being a relatively unknown concept, the European Commission is considering the continued development of ETAS at EU level. One recommendation, similar to the ETAS approach that is currently being discussed by the Academic Advisory Council of the Federal Ministry of Finance is the "principle of domicile with separate entity accounting" (Wissenschaftlicher Beirat beim Bundesministerium der Finanzen (2007)).² In this context, advantages and disadvantages of an EU-wide minimum tax rate are analyzed.

Hernler (2003, 2004a, 2004b) focuses the investigation of ETAS on a comparative description with respect to different incomes. A comprehensive economic and quantitative analysis and comparison with CCCTB has not been completed to date.

In this paper we develop decision rules for investors and draw general conclusions about the influence on corporate decisions of taxing multinationals under ETAS or CCCTB. The investigation is based on a dynamic model of capital budgeting. Referring to real corporation data and modelling a representative multinational group, the effects of ETAS and CCCTB on the corporations' choice of international location are analyzed.

Section 2 illustrates the systems in a descriptive way. In section 3 we provide a multi-period analysis of marginal investment decisions of a multinational group. Our investigation aims to identify settings under ETAS and CCCTB for which tax planning remains possible, and to show when a real investment is tax favoured or tax discriminated. In this context, we determine the required minimum pre-tax rate of return on investment of a real investment in com-

² Cf. further Schreiber, 2008, pp. 120-123.

parison to a financial investment in a multinational corporation. Thus, we can identify when a real investment is tax favoured or tax discriminated by the underlying tax system. In the following analysis we model the effects of retention policy, different determination of taxable income and the relocation of a business entity's domicile under ETAS and CCCTB. In addition, the concept of CCCTB is analyzed with respect to the differentiation between business income and non-business income. Finally, we demonstrate to what extent the tax burden of corporations can be influenced by ETAS and CCCTB.

2 European Corporate Tax Concepts

2.1 European Tax Allocation System (ETAS)

The European Tax Allocation System is a proposal for the harmonization of international company taxation in the European Union. The system is based on current tax systems across the EU. If a group of affiliated companies is characterized by certain conditions, the ETAS holding can opt to include its subsidiary or subsidiaries into the ETAS group.

If it does so, the group is taxed according to particular taxation rules. As fundamental prerequisites, the parent company and its subsidiaries have to be domiciled in and managed from an EU Member State. In addition, the companies must prepare their financial statements by the same closing date. Also, the parent company must hold, indirectly or directly, at least 50% of equity or voting rights of the subsidiary.

Taxable income and corporate tax are determined by the tax laws of the Member State of domicile. In a second step the tax bases before national loss-offset, which are separately determined in each country in accordance with national tax laws, are summed up.³ After the group loss offset is performed, this so-called "EU tax base" represents the total tax base of the group for the tax assessment period under review. Multiplying this EU tax base with the tax rate in the parent company's state of domicile produces the multinational corporation's EU

³ Cf. Hernler, 2004b, p. 247.

base tax. The EU base tax is set off against the corporate tax the subsidiaries have to pay to the respective Member State. Any shortfall in taxes has to be paid to the parent company's country of domicile; any excess tax paid forms what is known as an EU tax credit carry forward, which is credited towards the corporation's tax burden in subsequent years. This EU tax credit carry forward can be continued as account carried forward within the affiliated group and can thus be entirely set off against the corporate tax of the following years.⁴ In ETAS the tax burden of real investments for multinational corporations significantly depends on the EU tax credit mechanism and the EU tax credit carry forward. Furthermore, the perpetuation of national tax laws and the resulting added tax base (EU tax base), multiplied with the tax rate of the respective Member State, are major factors.

Consequently, ETAS has been included in the Commission's work programme.⁵

2.2. Common Consolidated Corporate Tax Base (CCCTB)

CCCTB is a system based on one common consolidated tax base for multinational corporations operating transnationally in the European Union. Existing EU tax legislation is extended to include a new tax base that is not founded on national tax law. All Member States have to cooperate on determining this common tax base. The intention is to apply CCCTB uniformly in all Member States and to eliminate country-specific differences.⁶

Various working parties of the Commission are currently examining what conditions have to be met in order to qualify for CCCTB. However, it has already been agreed that it shall apply to the regulations for a group of eligible companies that are domiciled in the participating Member States. A working group is currently discussing the requirements that have to be met by participating corporations and which subsidiaries will be apportioned to the consolidated

⁴ Cf. Hernler, 2004b, p. 248, Hernler, 2004a, p. 394.

⁵ Cf. European Commission, 2003, p. 10.

⁶ Cf. Cnossen, 2001, pp. 532-535; Mintz and Weiner, 2003, 695-697; Plasschaert, 2005, 64-67.

companies.⁷ The Commission favours the introduction of an option for taxation under CCCTB. In any case, however, it must be defined which corporations are eligible.⁸

To determine the tax base, the profits are calculated according to uniform European regulations for each affiliate. Subsequently, the affiliates' profits are consolidated to yield a consolidated figure. This consolidated tax base is then apportioned to the Member States using a yet to be defined key.⁹

While this procedure restricts the Member States' tax autonomy, they still determine their own tax rates. The tax burden is calculated by multiplying the tax rate with the proportionately apportioned CCCTB. The majority of issues specific to CCCTB, notably consolidation and apportionment, have not been resolved so far. If US-style formal apportionment will be implemented, the factors payroll, property and sales would become very significant.¹⁰ Consolidation is expected to be based on IFRS, modified by tax aspects. The rules for loss-offset are still under discussion. Currently it is unclear whether non-business income will be included in the loss compensation. If so, a huge potential for loss-offset will be available.

A significant impact on the tax burden under CCCTB arises from the consolidated tax base, the transnational loss-offset, the apportionment formula and the type and weighting of the apportionment factors. In turn, the distinction between business income and non-business income is important. Particularly relevant aspects of these items are discussed in the following analysis.

Both the European Parliament and the European Economic and Social Committee are in favour of implementing CCCTB.¹¹ Working groups have been established at EU level that focus exclusively on drafting components of CCCTB.¹²

⁷ Cf. European Commission, 2006b, pp. 4-6.

⁸ Cf. European Commission, 2007, p. 2.

⁹ Cf. European Commission, 2006a, pp. 6-8.

¹⁰ Cf., e.g., Goolsbee and Maydew, 2000, p 125; European Commission, 2001, p. 45, Eggert and Schjelderup, 2003, pp. 439-446; Wellisch, 2004, p. 24-41.

¹¹ Cf., e.g., European Parliament, 2006, p. 6; European Economic and Social Committee, 2006, C88/48.

¹² Cf. European Commission, 2006b, pp. 3-4.

2.3 ETAS vs. CCCTB

The previous explanations point out that CCCTB and ETAS differ significantly. However, the systems also show several similarities. The following table provides an overview of the similarities and differences:

Table 1: Comparison of ETAS and CCCTB

	ETAS	CCCTB
basis of the system	maintaining current tax systems to foster tax rate competition and convergence of tax rates	harmonization of tax bases
basis for consolidation	actual tax law of the EU Member State	implementation of uniform European regulations (IFRS as starting point)
participating companies	holdings and subsidiaries domiciled in EU Member States	holdings and subsidiaries domiciled in EU Member States
involved tax types	corporate income tax	corporate income tax
tax rates	maintaining tax rates (with the objective of harmonization)	maintaining tax rates (discussion about a harmonization of tax rates or a minimum tax rate)
option to perpetuate the current tax system	yes	yes
subject to changes of the current tax system	maintaining of the current accounting rules, modifications are obtainable in the short- to medium-term	implementation of new accounting rules, extension of the current tax system, basic modifications are obtainable in the long-term
effort and cost involved in implementing the system	for corporations and tax authorities, relatively simple and low-cost	considerable complexity for corporations and tax authorities
tax autonomy of the Member States	tax autonomy maintained	tax autonomy restricted
legal form of consolidated entities	according to tax legislation in the Member State of domicile	corporation
credit mechanism	corporate tax paid by the subsidiaries decreases the group's tax burden	no credit mechanism
allocation of income	no allocation	allocation factors: formula apportionment
problem of transfer pricing	minimized using credit mechanism	minimized by using common consolidated tax base
loss-offset	group-wide loss-offset	group-wide loss-offset
compliance costs	lower	lower
Transparency of determining taxable income	no EU-wide transparency	strong EU-wide transparency

3 Quantitative Analysis of Tax implications for European Corporate Investment

3.1 The Model

3.1.1 General Assumptions

As there are significant differences in tax rates and tax bases across the EU Member States, it cannot be claimed that taxation is neutral with respect to company location. Against this background, we will investigate the degree of tax distortion of transnational investments under ETAS and CCCTB. We will examine whether ETAS or CCCTB can reduce the distor-

tions that exist under the current national tax laws across the EU. Our reference tax system is the EU's current system of taxation. In the following we take the German tax system as a proxy for corporate tax law. We will determine the required minimum rate of return (before tax) and in turn, the pre-tax cost of capital of a transnational investment based on the different concepts of taxation. The pre-tax cost of capital represents the required minimum rate of return before taxes that a real investment has to achieve to provide the investor with the same after-tax rate of return as an alternative financial investment. To identify the different tax burdens we determine and compare the pre-tax cost of capital of an investment that is otherwise identical, especially with respect to the post-tax return. The pre-tax cost of capital is determined recursively by the Baldwin yield¹³ of the investment.

We perform an international comparison of tax burdens applying a dynamic capital budgeting model and running a numerical simulation of tax assessment. We model a parent company, domiciled in country A, and its wholly-owned subsidiary, located in country B. Countries A and B are both assumed to be EU Member States. The multinational corporation is planning an investment (e.g., to expand its range of products). As we assume it is a public corporation, we will not make reference to the shareholder level, for example to natural individuals. Due to the diversity of shareholders and their tax situations, it is not possible to include their attributes in the corporate decision-making process representatively. We therefore concentrate on the tax effects on corporate level. The amount the multinational corporation is willing to invest is denoted by I_0 (e.g., a manufacturing company plans to extend its product range). It has own means (equity capital) that can be invested either in the real investment or in the capital market. The capital market interest rate is denoted by r . One half of the transnational investment I_0 is assumed to be made in the holding's country of domicile H, whereas the remainder of I_0 is invested in the subsidiary's country of domicile S.¹⁴

¹³ Cf. Baldwin, 1959, pp. 98-104.

¹⁴ A proportional investment is assumed in both companies as this enables us to take into account different after-tax cash flows for both subsidiary and parent. This also enables us to perform a closer analysis of the cost of capital under varying tax

The tax assessment will be simulated for a period of ten years within a complete financial plan.¹⁵ We model different time patterns of the cash flows CF_t and start with cash flows that are constant over time and identical in country H and S: $CF_1^H = CF_1^S = CF_2^H = CF_2^S = \dots = CF_T^H = CF_T^S$ with CF_t^H the cash flow in the holding and CF_t^S the cash flow in the subsidiary in period t. Taxes are paid on the national tax base given by the cash flow less depreciation allowances, where depreciation is a proxy for all non-cash items that can influence the tax base (e.g., provisions, caused by inventory valuation, etc.). For simplicity, we assume a linear depreciation for all scenarios as it is the most common depreciation tax allowance in the EU Member States. We generate the cash flows in a way that the after-tax rate of return of the real investment is identical to the interest rate for the financial investment.

Furthermore, we have to account for the fact that each EU Member State has its own regulations governing loss offset. As all Member States provide for loss carry forwards¹⁶, the possibility of unlimited loss carry forward is given in the following model. For simplicity, special minimum tax rules will not be considered in the following investigation.¹⁷ Neither will loss carry backs nor possible transnational interpersonal loss offset¹⁸ be considered. Furthermore, it is presumed that at the point of investment ($t=0$) no tax loss carry forwards exist for either parent company or subsidiary. At the end of the time horizon ($T=10$) we assume that the investment object is disposed of at its carrying value. Consequently, no capital gains occur and thus we can abstract from capital gains taxation. If profits are retained (case of retention), all retained earnings will be distributed at once at the end of the planning horizon ($T=10$).

rates in both Member States of domicile. If the investment were performed entirely in the subsidiary's Member State, the effects would be even stronger. In case of a lower (higher) tax rate in the subsidiary's Member State, the cost of capital would decrease (increase). Then, the difference between retaining and distributing earnings, as analyzed in the following section, would increase. See section 3.3.2.

¹⁵ This kind of modeling allows us to model real investments that are regularly long-term investments in a multi-period, dynamic context. Other approaches, e.g. the effective average tax rates (EATR) according to Devereux and Griffith, are based on a simple one-period model and thus tax effects can only be considered to a limited extent (Devereux and Griffith, 1999). We therefore prefer the finance-based, multi-period model.

¹⁶ While some Member States allow for unlimited loss carry forwards, others only allow them for a limited number of years.

¹⁷ These provisions exist e.g. under Section 10d of the German Income Tax Act.

¹⁸ Transnational loss offset is currently allowable only in Denmark, France, Italy and Austria. The requirements differ significantly and to some extent are highly restrictive.

Our model includes corporate tax only. Local business tax as levied in Germany is not included in the model because it has not yet been considered in the present draft concepts of CCBT and ETAS.¹⁹ Furthermore, as under the Parent/Subsidiary Directive withholding tax is not deducted from earnings distributed by the subsidiary to the holding, we abstract from withholding tax.²⁰ If profits are retained, they are invested in the country where they were generated. Otherwise, if they are distributed, dividends are paid at the end of period t and invested in the parent company's country of domicile at discount rate r .²¹ Positive distributed earnings of the subsidiary are invested and taxed in the parent's country of domicile. In reality, this procedure is untypical, especially if the parent is domiciled in a high-tax country and if the multinational corporation strives to maximize profits. However, in the following analysis this assumption enables us to draw conclusions about the bias of tax distortions and the influence of the different corporate taxation components by varying the tax rates. Moreover, in the case of distributed earnings both ETAS and CCCTB have to take account of corporate tax rules governing received dividends such as those codified in Section 8b of the German Corporate Income Tax Act. This section exempts from taxation earnings that are distributed to the parent company. Nonetheless, e.g., in Germany 5% are considered non-deductible operating expenditure (Section 8b (5), German Corporate Income Tax Act). Consequently, 95% are effectively tax-exempt,²² so that in the following analysis only 5% of the subsidiary's distributed earnings are included in the parent's tax base.²³

¹⁹ Trade tax is of particular importance specifically in Germany; nonetheless it has repeatedly caused problems in the debate at EU level. For contrary argumentation cf., e.g., Spengel/Wendt, 2007, pp. 50-53, Wissenschaftlicher Beirat beim Bundesministerium der Finanzen, 2007, p. 58. For simplicity, we abstract from the trade tax in the following investigation.

²⁰ See Section 5 (1) of the Parent/Subsidiary Directive.

²¹ In Germany, only under commercial law may profits be distributed in the same period they are generated. For simplicity, we assume this is also possible under tax law.

²² The German provisions are used here as an example. Similar provisions exist in a number of other Member States. See Section 4 (2) of the Parent/Subsidiary Directive.

²³ This proceeding shows the major effects if 95% were effectively tax-exempted. If alternatively 100 percent are tax-exempted, the impact on the pre-tax cost of capital is negligible.

3.1.2 ETAS

Under ETAS the tax bases of the parent and subsidiary are initially determined in accordance with the requirements of the parent and subsidiary's countries of domicile. To determine the tax burden under ETAS (T_t^{ETAS}) in period t , the tax bases before loss offset (TB_{bL}) in the parent and subsidiary's country are summed up and reduced by clearable loss-offset. The resulting amount is multiplied with the tax rate (τ^H) applicable in the parent's country of domicile.²⁴

$$(1) \quad T_t^{ETAS} = \tau^H \cdot [(TB_{bL,t}^H + TB_{bL,t}^S) - L_{ct}^{ETAS}],$$

$$\text{where } TB_{bL,t}^H = CF_t^H + II_t^H - D_t^H \text{ and } TB_{bL,t}^S = CF_t^S + II_t^S - D_t^S,$$

with

CF_t^H :	Cash flow in t in the holding's Member State,
CF_t^S :	Cash flow in t in the subsidiary's Member State,
D_t^H :	Depreciation in t in the holding's Member State
D_t^S :	Depreciation in t in the subsidiary's Member State
II_t^H :	Income on interests in t in the holding's Member State,
II_t^S :	Income on interests in t in the subsidiary's Member State,
L_{ct}^{ETAS} :	Clearable, unlimited loss carry-forward in t under ETAS at holding's level
$TB_{bL,t}^H$:	Tax base before loss offset in t under ETAS at holding's level,
$TB_{bL,t}^S$:	Tax base before loss offset in t under ETAS at subsidiary's level.

In case of a negative total tax base ($T_t^{ETAS} < 0$) it is assumed that an unlimited tax credit carry forward is possible.²⁵ Taxes paid by the subsidiary to its Member State of domicile can be credited against the tax burden of the ETAS holding. If a negative balance emerges - known as a tax credit carry forward ($TCCF_t$) of the group - it may be carried forward in full to the following years within the affiliated group. This carry forward reduces the tax burden of the multinational corporation in the following periods. Otherwise, a tax burden is generated that has to be paid by the holding to its country of domicile.

$$(2a) \quad T_t^{ETAS} - T_t^S = T_t^{ETAS,H}, \quad \text{with } T_t^{ETAS} \geq T_t^S,$$

$$(2b) \quad T_t^{ETAS} - T_t^S = TCCF_t, \quad \text{with } T_t^{ETAS} < T_t^S,$$

where T_t^S denotes the tax credit or the corporate tax paid by the subsidiary, and $T_t^{ETAS,H}$ represents the remaining tax burden.

²⁴ As no double loss utilization should occur (in the countries of domicile of both parent and subsidiary), the local tax base before loss offset is included in the EU tax base. Cf. Hernler, 2003, p. 61; Hernler, 2004a, p. 394.

²⁵ In ETAS loss offset at the parent level has not been conclusively resolved. However, in the following analysis not significantly different tax distortions occur by using another, possibly more restrictive loss offset.

The following example illustrates how the tax credit carry forward is set off.²⁶

Example:

In the first assessment period the ETAS subsidiary has to pay local taxes in the amount of € 500,000 to its Member State of domicile. These local taxes (known as the EU tax credit) paid to the Member State of the subsidiary are credited against the EU tax base, which is determined by adding the tax bases of the subsidiary and its holding and which is assumed to amount to € 100,000.

Table 2: Determination of the EU Tax Credit Carry Forward According to ETAS

ETAS holding		ETAS subsidiary	
EU base tax	€ 100,000	local tax	€ 500,000
./. EU tax credit	€ 500,000		
= EU tax credit carry forward	€ 400,000		

The chosen example illustrates the tax credit mechanism. If the tax rate in the holding’s domicile is significantly lower than the tax rate of the subsidiary’s Member State, an EU tax credit results.²⁷ In addition, an EU tax credit occurs if the holding generates losses and the subsidiary realizes profits.²⁸

A tax credit carry forward of € 400,000 remains. The subsidiary pays € 500,000 in the first period (t=1) and carries forward the remaining amount of € 400,000 to period 2 (t=2). This tax credit carry forward can be credited in full within the group. The tax credit carry forward (TCCF_t) of the previous period is first credited against the local tax of subsidiary T_t^S and then against the additive tax burden T_t^{ETAS} . In the following year the tax credit carry forward is credited initially against the local tax burden of the subsidiary, so that the tax credit is either

²⁶ Cf. Hernler, 2004b, pp. 247-248, for a similar example involving an offset of the tax credit carry forward.
²⁷ E.g., the subsidiary’s tax base amounts to € 1,250,000 and the tax rate of the subsidiary’s domicile is 40%. Hence, the local tax burden is € 500,000. If the additional holding’s tax base is € 180,000 the EU tax base is € 1,430,000. If the tax rate of the holding’s location is 7%, the resulting EU base tax is € 100,000.
²⁸ E.g., the tax rate in the holding and the subsidiary’s domicile is 40%. The holding’s tax base (before loss-offset) is -€ 1,000,000, the subsidiary’s tax base (before loss-offset) is € 1,250,000. Hence, the EU tax base is € 250,000a and the EU base tax is € 100,000.

fully utilized ($T_t^{S,TCCF}$) leading to a remaining positive tax payment of T_t^S , $TCCF_t$ or exactly 0, or partly utilized and the remainder ($TCCF_t^S$) will be carried forward.

Viz.:

$$(3a) \quad T_t^S - TCCF_t = T_t^{S,TCCF}, \quad \text{with } T_t^S > TCCF_t,$$

$$(3b) \quad T_t^S - TCCF_t = 0, \quad \text{with } T_t^S = TCCF_t,$$

$$(3c) \quad T_t^S - TCCF_t = TCCF_t^S, \quad \text{with } T_t^S < TCCF_t \text{ and } TCCF_t^S = TCCF_t - T_t^S.$$

If the amount that may be carried forward cannot be entirely offset (eq. 3c), the remainder $TCCF_t^S$ can be compensated in a further step up to the amount of the EU base tax T_t^{ETAS} at the parent level. The remaining tax burden $T_t^{ETAS,TCCF}$ has to be paid to the parent's Member State of domicile. Otherwise, if the remainder $TCCF_t^S$ exceeds the tax burden T_t^{ETAS} , the remaining $TCCF_t^{cons}$ is carried forward to the following periods until the tax credit carry forward is fully utilized.

$$(4a) \quad T_t^{ETAS} - TCCF_t^S = T_t^{ETAS,TCCF}, \quad \text{with } T_t^{ETAS} > TCCF_t^S,$$

$$(4b) \quad T_t^{ETAS} - TCCF_t^S = 0, \quad \text{with } T_t^{ETAS} = TCCF_t^S,$$

$$(4c) \quad T_t^{ETAS} - TCCF_t^S = TCCF_t^{cons}, \quad \text{with } T_t^{ETAS} < TCCF_t^S \text{ and } TCCF_t^{cons} = TCCF_t^S - T_t^{ETAS}.$$

It is not yet resolved whether under ETAS, a limitation will be imposed on tax credit carry forwards and the tax credit mechanism. The possibility to limit this carry forward in time or amount has not been discussed but kept unsettled and should be integrated in the political conversion of ETAS.²⁹

3.1.3 CCCTB

As the necessary details for determining the tax base and allocating the tax burden under CCCTB have not been finalized yet, we have to make a number of appropriate assumptions in order to perform an assessment simulation.

²⁹ Cf. Hernler, 2004b, p. 250.

As it is anticipated that modified IFRS financial statements will be the starting point, we assume for the sake of simplicity that the tax base under CCCTB will not be broadened due to modified tax regulations (Jacobs et al., 2005) and that the determination of business income will correspond to the sum of business income under current tax law. In our simplified model the consolidated tax base TB_t^{CCCTB} is determined by the following formula:

$$(5) \quad TB_t^{CCCTB} = BI_t^{CCCTB} - L_{ct}^{CCCTB},$$

where

$$BI_t^{CCCTB} = CF_t^H + II_t^H - D_t^H + CF_t^S + II_t^S - D_t^S,$$

with

BI_t^{CCCTB} :	Consolidated business income in t under CCCTB at group level,
L_{ct}^{CCCTB} :	Clearable, unlimited loss carry-forward in t under CCCTB at group level,
TB_t^{CCCTB} :	Tax base in t under CCCTB at group level.

The uniformly determined tax base TB_t^{CCCTB} has to be apportioned to countries A and B. In this context, the allocation factors are of particular importance as the effects of apportionment can vary widely depending on the choice of factors.³⁰ One possible apportionment system for the EU is based on US tax law. In the US, apportionment is based on payroll, property and/or sales.³¹

In our model, the factor sales is used as the only allocation factor. With respect to the definition of sales, it is assumed that they are determined by cash flow. Hence, cash flow is assumed to be 5% of sales.³² It is presumed that the destination point corresponds to the place of origin:

$$(6a) \quad CF_t^H = 0,05 \cdot S_t^H,$$

$$(6b) \quad CF_t^S = 0,05 \cdot S_t^S,$$

where S_t^H and S_t^S are sales in the holding's and the subsidiary's Member States.

Therefore, the apportionment is determined by

³⁰ Cf., e.g., Wellisch, 2004, p. 25.

³¹ Cf., e.g., Goolsbee and Maydew, 2000, pp. 127-128.

³² Thus the payments indirectly include expenditure but not depreciation. The sales/payments ratio conforms to a sample of German medium-sized, large-sized enterprises in the engineering industry. The information was taken from the German database DAFNE. The sensitivity analysis showed that a variation in the parameter (cash flow in relation to sales) would have no significant impact on the results.

$$(7) \quad T_t^{\text{CCCTB}} = \tau^H \cdot \alpha_t^A + \tau^S \cdot (1 - \alpha_t^A),$$

with $\alpha_t^A = \frac{S_t^H}{S_t^H + S_t^S}$, where T_t^{CCCTB} describes the tax burden under CCCTB and τ^H and τ^S are the tax rates in the holding's and the subsidiary's Member States.

The loss offset option currently favoured by the EU Commission³³ and assumed in this analysis foresees that losses remain at the parent level and can be set off against future consolidated profits.³⁴ As the Commission favours transnational loss offset at the parent level, we assume that any losses remain at parent level.

Obviously, many details with respect to the CCCTB have yet to be resolved. The tax burden and the resulting effects on investment decisions significantly depend on the choice and weighting of the apportionment factors in formula apportionment. A Commission working group is currently drafting the apportionment factors. Payroll, sales and property have not been excluded so far. As the present analysis uses the “sales” factor, which affects a shift in the cost of capital, the main driving factors in our analysis do not depend on the allocation formula (retention policy, differentiation between business and non-business income).

3.2 Analysis of the basic scenario

In the following section we introduce the basic model. In a sensitivity analysis we analyze the impact of selected parameters of the underlying systems on the results.

We presume a market rate of return and a discounting factor of $r = 0.1$.³⁵ The parent's initial outlay is given by $I_0=200$. The overall real investment holds for a planning horizon of ten years, whereas the investment object is depreciated straight-line over five years, in both coun-

³³ Cf. European Commission, 2007, p. 6.

³⁴ Cf. European Commission, 2006b, p. 4.

³⁵ In consideration of the tax rate in the respective Member State we have $r_t^H = r \cdot (1 - \tau^H)$ for the after-tax discount rate in the holding's Member State and $r_t^S = r \cdot (1 - \tau^S)$ for the after-tax discount rate in the subsidiary's Member State.

tries A and B, in accordance with the expected taxable useful life.³⁶ The decision criterion in the investigation is the resulting required minimum pre-tax rate of return, which is equal to the pre-tax cost of capital. To demonstrate the effects of ETAS and CCCTB in contrast to current tax laws in the European Union, the existing tax system is used as starting point in the analysis.

Initially, a tax rate of 30% is assumed in both the parent and the subsidiary’s Member States of domicile.³⁷ Furthermore, earnings are assumed to be retained. Then, the resulting pre-tax costs of capital for the different EU tax concepts are almost identical:

Table 3: Pre-Tax Cost of Capital in the Basic Scenario

tax system	CCCTB	ETAS	actual tax law
pre-tax cost of capital before tax	9.5%	9.5%	9.5%

Table 3 demonstrates the real investment benefits from tax privileges due to the depreciation effects compared to the financial investment with a pre-tax rate of return of 10%.

Under ETAS, within the first periods of the planning horizon no tax burden accrues for the multinational corporation due to depreciation effects. This effect is identical to the one under the present tax system. Once the investment is fully depreciated, taxes have to be paid to the respective Member State of domicile. Despite the different determination of the tax bases in these two tax systems, an identical tax burden results for both parent and subsidiary under current tax law and under ETAS. The full effect of the tax credit on the corporate tax already paid to the subsidiary’s Member State of domicile decreases the EU base tax under ETAS. No tax credit carry forward occurs. By contrast, under CCCTB taxes have to be paid already in the second period of the planning horizon to the respective Member State of domicile, resulting from the separate loss offset of business or non-business income. Here, interest income is

³⁶ See sensitivity analysis, section 3.3.3 for an analysis with different expected taxable useful lives in Member States A and B.

³⁷ See sensitivity analysis, section 3.3.2.

taxed separately as non-business income and is not set off against operating losses. That is why the business income tax base becomes positive at a later point in time than under ETAS or current tax law, because the interest income does not increase profit. Under CCCTB these interest effects can influence the liquidity in case of high-income payments as taxes on interest income are payable earlier than under ETAS or the present system. In this basic scenario, assuming identical tax rates in the EU Member States, the tax burden of the corporation will not vary.

In reality tax rates across the EU differ considerably. For multinational corporations with transnational operations, this basic scenario and its uniform level of taxation will not represent the normal case. Furthermore, the assumption of a policy of full earnings retention is a very simplified premise. Nonetheless, the basic scenario we have just analyzed reflects the greatest possible uniformity of results within the different tax concepts. In the following section we analyze how differing sets of assumption influence the tax burden under the underlying concepts.

3.3 Sensitivity Analysis

3.3.1 Tax Rates

Using a sensitivity analysis we will now investigate the influence of selected parameters on the pre-tax cost of capital and on the tax burden.

Now, the tax rates in the two Member States of domicile are non-identical and modelled between 10 and 40%.³⁸ In addition, we consider two different types of the CCCTB concept. Firstly, we distinguish between business and non-business income in analogy to the procedure in the US (CCCTB (I)). In this case, non-business income, e.g., interest income and dividends, is not included in the loss compensation, but allocated directly to the respective busi-

³⁸ Cf., e.g., Slemrod, 2004, for the implications of changes in nominal and effective company tax rates.

ness entity.³⁹ Secondly, we relax the assumption of a differentiation between business and non-business income (CCCTB (II)). Then, business income is not taxed separately and included in the loss compensation.⁴⁰

The pre-tax cost of capital for the investigated combinations of tax rates under CCCTB, ETAS and current tax law for some selected examples is:

Table 4: Pre-Tax Cost of Capital in Case of Retained Earnings

Cases	Combination of tax rates	CCCTB (I)	CCCTB (II)	ETAS	actual tax law
1	$\tau^H = 0.4; \tau^S = 0.1$	9.7%	9.6%	11.8%	9.7%
2	$\tau^H = 0.3; \tau^S = 0.3$	9.5%	9.5%	9.5%	9.5%
3	$\tau^H = 0.1; \tau^S = 0.4$	9.6%	9.6%	8.7%	9.6%

CCCTB (I): Differentiation between business and non-business income under CCCTB

CCCTB (II): No differentiation between business and non-business income under CCCTB

Table 4 shows that under ETAS the real investment is tax discriminated in the case of a pre-tax rate of return of 11.8%, whereas the pre-tax rate of return of the finance investment amounts to 10.0%. This effect occurs under ETAS because of a high tax rate of 40% in the holding's Member State (country H). The subsidiary's tax base is included in the EU tax base and hence also subject to the high tax rate of 40%. In the other cases the real investment is tax favoured in all tax systems compared to the financial investment due to dominating depreciation effects.⁴¹

Thus, table 4 demonstrates that the chosen combinations of tax rates vary in terms of their influence on the pre-tax cost of capital. Major fluctuations occur especially under ETAS. If the ETAS holding is domiciled in a high-tax country,⁴² the parent's pre-tax cost of capital is on principle higher than under the other tax concepts (cases 1) particularly due to the combi-

³⁹ Cf. Weiner, 2005, p. 22; Agúndez-García, 2006, pp.17-18.

⁴⁰ This treatment is also recommended by several experts, cf., e.g., Spengel and Wendt, 2007, pp. 37-38.

⁴¹ The present value of linear depreciation is greater than the present value of an economic depreciation and thus a neutral depreciation pattern.

⁴² High-tax country, viz. $\tau^H > \tau^S$.

nation of a high tax rate and high tax base under ETAS. The high EU tax base, which is multiplied with a high tax rate, leads to a high EU base tax burden before considering the EU tax credit carry forward, so that the parent's tax burden under ETAS is significantly higher than under CCCTB or current tax law. While the corporate tax levied by the Member State of the ETAS subsidiary can be credited entirely against the tax liability of the parent company, the higher tax rate in the parent's country of domicile will apply also to the subsidiary's tax base. On balance, the parent will hence have to bear a higher tax burden than under the present system and CCCTB.

By contrast, if the parent is domiciled in low-tax country⁴³, its cost of capital before tax will be relatively lower under ETAS (case 3) as the EU tax base is multiplied with a lower tax rate and therefore the parent's EU base tax will be lower. Due to the tax credit mechanism, the subsidiary's high tax payments in Member State S mean that no or only few remaining taxes accrue, so in most cases an EU tax credit carry forward will be formed at parent level. In addition to the lower EU base tax, this tax credit carry forward will decrease the parent's tax burden in subsequent periods.

Obviously, under ETAS the EU tax credit carry forward can have a significant impact on the cost of capital. The higher the tax burden in the subsidiary's Member State and the lower the tax burden in the parent's Member State, the stronger the effects of the EU tax credit carry forward on the tax burden. As a result the tax revenue of the subsidiary's Member State of domicile may even decrease. A lower tax burden in the subsidiary's Member State can arise particularly if a negative EU tax base for the ETAS group is determined, and the parent's tax losses cannot be compensated by gains of the ETAS subsidiary even in the long term.

The pre-tax cost of capital under CCCTB do not vary significantly with varying tax rates compared to the current tax system, particularly due to the chosen formula apportionment and

⁴³ Low-tax country, viz. $\tau^H < \tau^S$.

the positive periodical cash flows (CF_t).⁴⁴ The formula apportionment under CCCTB (I) and (II) is merely based on sales, which in our model are assumed to be generated symmetrically by the parent and the subsidiary. There are no significant differences between the investigated variations of CCCTB (CCCTB (I) and CCCTB (II)). However, small alterations can be identified with respect to the differentiation towards business and non-business income. The results are obvious: Due to the loss-offset between the different income types (ordinary income and non-business income) the pre-tax cost of capital under CCCTB (II) is lower than under CCCTB (I). Although in our model the effects are rather small, the impact of the differentiation of business and non-business income should not be neglected. Furthermore, we assume linear tax rates. In case of progressive tax rates these effects would become stronger. In our investigation the cost of capital before taxes and the tax burden are identical under both CCCTB (I) and current tax law. In this example, the pre-tax cost of capital under CCCTB (I) always remains the same independently of the chosen tax rates. Yet in reality, this similar or even identical situation will be an exception. Still, varying the tax rates reveals that CCCTB and the current system cause fewer tax rate-induced distortions than ETAS. Nevertheless, under CCCTB the Member States lose sovereignty in tax policy. In contrast, the aim under ETAS is to preserve competition among the Member States in order to maintain their sovereignty while allowing them to approximate their tax rates.

3.3.2 Distribution of earnings

Under the above assumptions, we find the following pre-tax cost of capital for the investigated combinations of tax rates if earnings are distributed:

⁴⁴ Bond and Chennells, 2000, and the European Commission, 2001, analyzed the effects of corporate taxation on the cost of capital. Bond and Chennells, 2000 limit their investigation to the current tax laws in seven Member States. Besides investment decisions at the national level, the investigation also includes transnational investments. Cf. Bond and Chennells, 2000, pp. 7-14 and 18-21. The European Commission, 2001 also examines different tax scenarios within the EU, e.g. the harmonization of depreciation, cf. European Commission, 2001, p. 153. The analysis includes the shareholder level, so that a direct comparison with our results is not possible. Nonetheless, the summary of the simulation comes very close to our results particularly with respect to CCTB. Assuming a common consolidated tax base, the cost of capital is identical to the cost of capital under the basic scenario and current tax law, cf. European Commission, 2001, pp. 171-176.

Table 5: Pre-Tax Cost of Capital in Case of Completely Distributed Earnings

cases	combination of tax rates	CCCTB (I)	CCCTB (II)	ETAS	actual tax law
1	$\tau^H = 0.4; \tau^S = 0.1$	10.7%	9.7%	11.7%	10.8%
2	$\tau^H = 0.3; \tau^S = 0.3$	9.6%	9.5%	9.5%	9.6%
3	$\tau^H = 0.1; \tau^S = 0.4$	8.7%	9.7%	8.5%	8.7%

CCCTB (I): Differentiation between business and non-business income under CCCTB

CCCTB (II): No differentiation between business and non-business income under CCCTB

A tax privilege of the real investment is identifiable in all tax systems for cases 2 and 3. Table 5 shows also that the real investment is tax discriminated in case 1 with respect to the current tax system and CCCTB (I).⁴⁵ Under CCCTB (I) and the current tax system, this is due to the effects of earnings distribution. The required pre-tax rate of return (10.7% or 10.8%) of the real investment is higher than the pre-tax rate of return of the financial investment (10%). The earnings distributed by the subsidiary are invested and taxed in the holding's Member State at 40%. CCCTB (II) has to be regarded as a special case because distributed earnings (as non-business income) are included in the loss compensation and thus also affect the formula apportionment.

At first glance, there are no significant differences between distributed and retained earnings (table 5 and 4). Neither ETAS nor CCCTB bring forth any surprises with regard to the transnational investment in any of these combinations, although the distributed earnings are considered to be reinvested in the parent's Member State of domicile. However, a closer look reveals that the cost of capital in case of retained earnings varies considerably to that in case of distributed earnings (table 6).

In case of retained earnings the relative differences of the pre-tax cost of capital differ significantly under the current tax system and under CCCTB (I), especially if tax rates vary between country H and S. Under ETAS these relative differences are smaller. This effect is due to the differences in the way the tax systems treat interest. Under current tax law and CCCTB (I)

⁴⁵ For explanations for ETAS see section 3.3.1

interest income is taxed as non-business income in the Member State it is generated. In the case of distributed earnings, the entire amount of interest income is subject to taxation in the parent’s Member State of domicile. If the parent’s Member State has a high tax rate, under the present tax system and CCCTB (I) the tax burden will be higher than if earnings are retained (case 1). By contrast, with a low tax rate in the parent’s Member State (case 3), the pre-tax cost of capital will be lower because the interest income is taxed here.

Table 6: *Relative Difference in Cost of Capital before Taxes in Case of Distributed Earnings Compared to Those in Case of Retained Earnings*

cases	combination of tax rates	CCCTB (I)	CCCTB (II)	ETAS	actual tax law
1	$\tau^H = 0.4; \tau^S = 0.1$	10.3%	1.0%	-0.8%	11.3%
2	$\tau^H = 0.3; \tau^S = 0.3$	1.0%	0.0%	0.0%	1.0%
3	$\tau^H = 0.1; \tau^S = 0.4$	-9.4%	1.4%	-2.3%	-9.4%

CCCTB (I): Differentiation between business and non-business income under CCCTB

CCCTB (II): No differentiation between business and non-business income under CCCTB

ETAS weakens these effects. The simple addition of the tax bases to the EU tax base produces a very similar tax base regardless of whether earnings are retained or distributed. It hence does not play a significant role where interest income is taxed and what distribution policy is favoured. The tax burden is always very similar regardless of whether earnings are distributed or retained. Consequently, ETAS produces fewer tax distortions compared to the retained earnings case. Under the current system and CCCTB (I) special rules could be integrated into the respective tax code to reach a corresponding insensitivity towards earnings distribution policy.

Because there is no differentiation between business and non-business income under CCCTB all types of income are included into the taxable amount. Hence, the relative differences between retained and distributed earnings are minimized under CCCTB (II). Due to the positive cash flow in the initial periods of the planning horizon the interest income is positive. If this

positive interest income is included in the consolidated tax base it can be set off against business income. Thus, the pre-tax cost of capital decreases significantly. Our investigation shows that the differentiation between business and non-business income under CCCTB is of particular importance.

3.3.3 Taxable income

Whereas CCCTB entails new regulations for a uniform EU-wide determination of taxable income, under ETAS the national tax regulations are maintained. The perpetuation of national tax laws under ETAS is justified by the fact that otherwise, specific national tax exemptions and privileges, e.g. sponsorships of research, would have to be taxed at group level.

The influence of the national determination of taxable income has not been considered in our model so far. To find out the magnitude of a possible impact on our results the assumption of a uniform determination is relaxed in this part of the sensitivity analysis. Hence, in the following investigation we analyze the impact of applying different national tax codes under ETAS. We investigate the influence of different national tax codes by using different expected useful lives of the investment object for Member States H and S. The depreciation pattern serves as proxy for non-cash determinants of the tax base (e.g., provisions, inventories, etc.).

Table 7: Pre-Tax Cost of Capital for different expected useful lives under ETAS

	case 1 $\tau^H=0.4; \tau^S=0.1$	case 2 $\tau^H=0.3; \tau^S=0.3$	case 3 $\tau^H=0.1; \tau^S=0.4$
<u>basic scenario</u>	11.8%	9.9%	8.8%
<u>option 1</u>	11.9%	10.0%	8.8%
<u>option 2</u>	12.0%	10.3%	8.9%

Basic scenario: Useful life Member State H (holding) 5 years, Member State S 5 years

Option 1: Useful life Member State H (holding) 10 years, Member State S immediate write-off

Option 2: Member State H (holding) immediate write-off, useful life Member State S 10 years

Table 7 shows the pre-tax cost of capital for various tax rate combinations and different taxable useful lives. These results demonstrate the effects of differing national rules for the taxable income under ETAS.

Generally, there are slight differences with respect to the underlying useful lives for the analyzed options 1 and 2 compared to the basic scenario. If a longer expected useful life of 10 years is assumed for the holding's Member State H and immediate depreciation is presumed in the subsidiary's Member State S, the tax specification of the respective Member States can be beneficial for the real investment of the underlying multinational corporation (option 1). As table 7 shows, the pre-tax cost of capital is lower under option 1 in cases 1 and 3 in comparison to option 2. Under option 2 the holding's country allows for accelerated depreciation and the subsidiary's country for a 10-year useful life.

If a long expected useful life of ten years is presumed in the subsidiary's Member State, the tax base is already positive in the first period under review due to the low depreciation allowance. Hence, the local tax burden arises at the subsidiary's level in the first period. At group level a tax credit already occurs in the first period under review, so that the local tax burden can be credited against the group's tax burden. A remaining negative tax credit leads to an EU tax credit carry forward.

Otherwise, if an immediate depreciation can be applied in the subsidiary's Member State (option 1), the subsidiary's tax base is negative in the first period. In subsequent periods the local subsidiary's tax base becomes positive, so that the EU tax credit arises in later periods of the planning horizon. In this case, there is no⁴⁶ or only a low⁴⁷ EU tax credit carry forward due to the missing or lower negative credit. The tax credit can be compensated immediately or almost completely against the group's tax burden.

⁴⁶ If $\tau^H = 0.4$ und $\tau^S = 0.1$. The relatively low local tax payments in the subsidiary's domicile can be credited in full against the EU base tax.

⁴⁷ If $\tau^H = 0.1$ und $\tau^S = 0.4$. The relatively high local tax payments in the subsidiary's domicile cannot always be credited in full against the EU base tax.

In case of an immediate write-off in the subsidiary’s domicile the effects caused by the EU tax credit are higher for the overall planning horizon than in case of the ten-year depreciation. For the ten-year planning horizon the EU tax credit will have a greater effect on the group’s tax burden in case of an immediate write-off in Member State S and lead to lower pre-tax cost of capital under the given set of assumptions. Obviously, the tax rates in the holding or subsidiary’s Member State do not play a major role in our simulation.

However, we have to point out that these results cannot be generalized for further scenarios with inframarginal investment, i.e., cases where the real investment after taxes is more advantageous than the financial investment. Then, our results depend particularly on the chosen combinations of tax rates. If a profitable real investment after taxes is assumed, option 2 is more attractive, e.g., for a setting with a tax rate of 10% in the parent’s country of domicile and a tax rate of 40% in the subsidiary’s country of domicile. In this scenario the chosen combination of tax rates and the EU tax credit carry forward invoke a tax benefit.

In case of marginal investments and multi-period planning the effects differ slightly depending on the expected useful life. However, if we focus on the tax effects within one period, these differences can have considerable impacts.⁴⁸ For noteworthy impacts to occur over a multi-period planning horizon, the tax bases in the underlying Member States have to differ

⁴⁸ The possible effects in one single period are demonstrated in the following simple example. It is assumed that the subsidiary performs an investment that amounts to € 50,000. Depending on the expected useful life the following differences can occur:

Expected useful life in the subsidiary’s domicile	10 years	1 year
Subsidiary tax rate $\tau^S=0.1$		
Cash flow	€ 100k	€ 100k
Depreciation	€ 5k	€ 50k
Tax base	€ 95k	€ 50k
Taxes paid to the subsidiary’s domicile	€ 9.5k	€ 5k
Holding, tax rate $\tau^H=0.4$		
Cash flow	€ 50k	€ 50k
Subsidiary’s tax base	€ 95k	€ 50k
EU tax base	€ 145k	€ 100k
EU base tax	€58k	€40k

Due to the modified expected useful life the group’s corporate tax payments are €18k higher in case of 10-year depreciation in the considered period.

significantly. Then, further effects may occur due to the resulting interest effects depending on the divergent tax payments at different points of time.

The results demonstrate that multinational corporations can benefit from the perpetuation of national tax systems across the EU. By choosing to make tax-optimized real investments corporations can intentionally minimize the tax burden or the pre-tax cost of capital, respectively. These effects are due to the different national tax systems and the options regulated in diverse national tax laws (e.g., provisions or evaluation of inventories).

Generally, the EU tax credit can be credited in full against the group's tax burden if the EU base tax is higher than the taxes the subsidiaries paid to their respective Member States. A negative EU tax credit (EU tax credit carry forward) under ETAS occurs in particular if the tax rate of the holding's Member State is lower and if the tax rates of the subsidiary's Member State are higher, or if the group's tax base is negative. A proportionate tax credit would not eliminate tax planning completely, but lower the possibilities of intentional tax planning for EU-wide operating corporations.⁴⁹

Tax planning, as it is likely to occur under ETAS caused by the determination of national taxable incomes and its (undesirable) distortional implications, cannot arise under CCCTB due to the uniform regulations for all EU Member States.

3.3.4 Relocation of a business entity's domicile

As our previous investigation and the sensitivity analysis for different tax rates show, "losers" under ETAS and "winners" under CCCTB are generally groups whose parents are located in a high-tax country and whose subsidiaries are domiciled in a low-tax country. Hence, under ETAS there is an incentive to relocate the holding's domicile to a low-tax country to minimize the multinational's tax burden.

⁴⁹ Currently, it is not clear under ETAS if the EU tax credit can be entirely or partial credited against the EU base tax. Cf. Hemler, 2004b, p. 250.

Now, we study the tax effects for a scenario where the holding is relocated to a lower-tax country. Generally, the EU base tax will be lower if the holding is relocated because the EU tax base, or the sum total of the holding and the subsidiary's tax bases, respectively, are multiplied by the lower tax rate in the holding's Member State. The group's tax burden is consequently lower. Nevertheless, the subsidiary's tax base and its tax payment to its Member State are significant for the group's tax burden within the considered planning horizon.

If constant positive and equal cash flows over time are presumed in countries H and S - as is assumed in the basic scenario - and if the holding is domiciled in a low-tax country, the subsidiary has to pay its local tax in the first period of the planning horizon to its Member State. Due to the credit mechanism a negative surplus of EU tax credit or an EU tax credit carry forward, respectively, remains in the first period. No earlier than in the second period, this EU tax credit carry forward affects the tax burden of the ETAS group.⁵⁰ As the EU tax credit carry forward is first set off against the local tax of the subsidiary in the second period, the tax burden is then lower. Hence, there is a permanent disadvantage for the multinational corporation with respect to interest and liquidity effects. These interest and liquidity effects recur once the EU tax credit is consumed and thus have a long-term impact. In case of a restrictive credit mechanism the disadvantageous interest and liquidity effects could become even more intensive. If the taxes paid by the subsidiaries can be credited in full against the EU base tax, there are no negative interest and liquidity effects for the group. In this context it is not excessively advantageous for the ETAS group to relocate only the parent's domicile – and not the value-added part – to a low-tax area. Furthermore, a race-to-the-bottom effect would probably not occur as this effect would lead to a permanent EU tax credit carry forward and moreover, would not incur an immediate tax benefit. By this means (desired) convergence of the tax rates is likely to emerge.⁵¹

⁵⁰ Hernler confirms this intentional delay of the use of the EU tax credit carry forward (Hernler, 2004b, p. 250).

⁵¹ Cf. Hernler, 2004b, p. 250.

Nevertheless, the multinational's tax payments can be lowered by relocating the holding's domicile and taking advantage of the effects caused by substantial EU tax rate differentials. For a more restrictive credit mechanism, e.g., a restriction with respect to time or amount, specific rules could be implemented in ETAS to prevent the holding's relocation to low-tax countries from being beneficial with respect to taxes.

Under ETAS a competitive pressure of tax rates is generally considered desirable. A problematic situation may arise if the holding's tax rate amounts to zero (e.g. in Estonia in case of retained earnings). In this case a minimum tax rate would be useful for avoiding such constellations, in that the EU base tax annually amounts to zero.

The most advantageous situation for the multinational group would be one with almost equal tax rates in the underlying countries, as then the taxes the subsidiaries pay to their Member States can be credited in full against the group's tax base.

The tax rates are significant in both tax systems. The holding's tax rate is of particular interest under ETAS, as the holding's tax rate is levied on both the holding and the subsidiary's tax base (EU tax base). Moreover, the results significantly depend on the subsidiary's profit situation.⁵²

In contrast, under CCCTB the holding and the subsidiary's tax rates are important value drivers, depending on the allocation factor. However, the tax rates are the only component the Member States can autonomously determine under CCCTB. In principle, multinationals will react more sensitively with respect to the tax rates under ETAS or CCCTB than under the current tax system.

With respect to current conditions this situation may obviously be disadvantageous for high-tax countries and furthermore, may oblige high-tax Member States to reduce their tax rates.

Under ETAS an approximation of the tax rates to a medium level is likely due to the deferred

⁵² The consequences cannot be generalized as the effects change with respect to the income situation of the subsidiary. If the subsidiary does not realize taxable profits but generates losses, the EU tax credit amounts to zero and no EU tax credit carry forward occurs.

tax credit mechanism. However, under CCCTB the Member States run the risk of reducing their tax rates to a minimum level (“race to the bottom”) to counteract tax competition. Unlike ETAS, CCCTB does not include a mechanism for preventing a “race to the bottom” of the tax rates. Accordingly, implementing a minimum tax rate may be advisable under CCCTB.⁵³ Furthermore, the credit mechanism of ETAS can counteract the relocation of active operations, as long as the holding’s member state does durably not maintain the highest tax rate. A relocation of active operations (e.g., employment) is more conceivable under CCCTB, because depending on the allocation factors (e.g., payroll) the relocation can then be favoured. This circumstance could particularly discriminate industrial countries under CCCTB.

4 Summary

The components of a European tax system with CCCTB or ETAS differ significantly. Nevertheless, we can perform a comparison in the chosen model framework. We determine the minimum required minimum pre-tax rate of return of a real investment in comparison to a financial investment within a multinational group. We identify for specific scenarios under which conditions and tax concepts a real investment is tax favoured or tax discriminated. Furthermore, we show that both ETAS and CCCTB react sensitively to the variation of selected parameters, but each in their own way.

Our analyses demonstrate that the tax planning that is possible under the current tax system will be impaired under ETAS and under CCCTB.

With respect to tax rate differentials in the EU Member States we find that the “losers” under ETAS and the “winners” under CCCTB are generally groups whose holdings are located in a high-tax country and whose subsidiaries are domiciled in a lower-tax country. By contrast, corporations where the parent is domiciled in a lower-tax country and the subsidiary is located in a high-tax country are the “winners” under ETAS and “losers” under CCCTB. Hence, tax

⁵³ Cf. Spengel, 2007.

planning is possible under ETAS to a greater extent than under CCCTB due to the inclusion of all profits in the ETAS EU tax base that is then multiplied with the tax rate in the holding's state of domicile. Under ETAS the advantage of the real investment in comparison of the financial investments depends more heavily on the relation of the tax rates than under CCCTB or the current tax system.

For multinational corporations, tax planning under ETAS is not likely with respect to retention policy due to the EU tax base. Under CCCTB the outcomes for different retention policies significantly depend on the differentiation between business and non-business income. A concept of CCCTB where business income and non-business income are treated differently (see CCCTB (I)) is not recommended under the given set of assumptions, because tax planning for multinationals could be attractive depending on their retention policy. This effect is due to the differently taxed interest income; thus the distorting potential could be higher. As our results show, multinationals cannot influence their tax burden via their retention policy under CCCTB without differentiating between these different income types (see CCCTB (II)). Further, tax planning can be performed with respect to the determination of taxable income under ETAS, whereas it is not as attractive for multinationals under CCCTB because of uniform EU-wide tax regulations.

The competitive pressure resulting from the different tax rates is intended to lead to a convergence of tax rates at medium level and the perpetuation of tax competition. However, there is still an incentive to relocate the holding to a lower-tax country. The sensitivity analysis shows that the ETAS tax credit mechanism can prevent a relocation of the ETAS holding in profit situations, as there is a long-term impact with respect to interest and liquidity. However, under CCCTB the relocation of each business entity will be of particular importance when multinational groups optimize their European tax burden. A mechanism to prevent a "race to the bottom" in tax rates in the EU is not yet part of the CCCTB concept. The only way to circumvent this development under CCCTB is to introduce a minimum tax rate at EU level. The re-

location of active operation is more feasible under CCCTB depending on the allocation factors, whereas the credit mechanism under ETAS can even prohibit the relocation of any active operation.

In the sensitivity analysis we find out that tax planning still remains possible in some aspects under CCCTB and ETAS. Furthermore, the analysis points out that under ETAS and CCCTB several advantages can be specified, in comparison to the current tax system. Still, our results particularly depend on the assumptions made. E.g., assumptions about the loss-offset rules for both analyzed systems are made, as we focus on an unlimited loss-carry forward for ETAS and CCCTB. However, in both concepts the loss-offset rules are of significant relevance (Oestreicher and Koch, 2008). Furthermore, under ETAS it could be important for a multinational's tax planning whether full compensation or a proportionate tax credit will be implemented.

All in all, much discussion and analysis is still needed before CCCTB or a concept that is more oriented towards the principle of domicile (such as ETAS) can be implemented in the European Union. It is not possible to state unambiguously whether one system is more or less advantageous than the other as they differ considerably and many details remain unclear. Our analysis illustrates that many tax distortions will persist even after ETAS or CCCTB are introduced. Nevertheless, it shows that ETAS also provides several advantages compared to the higher-profile CCCTB, as under ETAS tax planning and in turn, tax distortions are in many cases less likely.

In summary, we find ETAS offers several important advantages compared to CCCTB and is a viable option, considering that it is simpler and easier to implement. Hence, ETAS has the potential to improve allocational and administrative efficiency and thus should be further elaborated.

Finally, we point out that the advantages of each tax system significantly depend on the individual investment situation the multinational corporation faces. However, the advantages also

depend on the legal framework and the definition of the respective concept. Politicians should keep in mind the sensitivities, advantages and drawbacks of both concepts when developing a European corporate tax reform and refining the idea of CCCTB.

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Impressum:

Arbeitskreis Quantitative Steuerlehre, arqus, e.V.

Vorstand: Prof. Dr. Jochen Hundsdoerfer,

Prof. Dr. Dirk Kiesewetter, Prof. Dr. Caren Sureth

Sitz des Vereins: Berlin

Herausgeber: Kay Blaufus, Jochen Hundsdoerfer,

Dirk Kiesewetter, Deborah Knirsch, Rolf J. König,

Lutz Kruschwitz, Andreas Löffler, Ralf Maiterth,

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ISSN 1861-8944