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Sustainability-oriented Future EU Funding: The case of a C(C)CTB

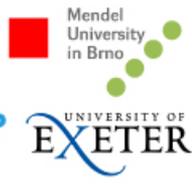
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Abstract

One of the most serious criticisms of the status quo with respect to the EU budget represents the lack of a link between the EU policy and the system of own resources. Strengthening the link between reaching smart, sustainable and inclusive growth and the EU system of own resources by introducing tax-based own resources could contribute to decrease the existing sustainability gaps in taxation in the European Union. This research demonstrates that the introduction of the Common (Consolidated) Corporate Tax Base (hereinafter as C(C)CTB) could be an important contribution to close the existing sustainability gaps in tax regimes in the EU. To research the revenue potential of the C(C)CTB, a model based on a remittance system was designed. The system foresees the replacement of the VAT-based own resource (resp. GNI-based own resource) through the transfer of a part of the corporate tax revenues based on the C(C)CTB raised on the national level to the EU budget. The results of the research show that the C(C)CTB-based own resource would be able to fully replace the VAT-based own resource, with the only exception of Cyprus. However, the C(C)CTB-based own resource cannot be considered to be a sufficient resource to fully replace the GNI-base own resource. Therefore, we recommend C(C)CTB only in connection with the replacement of the VAT-based own resource.

Keywords: Sustainability, EU system of own resources, CCCTB, European Union, budget

JEL classification code: H25, H61

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1 Introduction

After the long history of unsuccessful harmonization efforts in the area of corporate taxation, in 2001, the European Commission presented four possible harmonization models of corporate taxation. One of them represented the suggestion of the Common Consolidated Corporate Tax Base system (hereinafter as CCCTB), which was ultimately selected as a long-term strategy for the harmonization scheme in the area of corporate taxation. To design the system, the European Commission established a working group in 2004. The task of the group was to establish a common definition of the tax base for corporations with European activities and to design the basic tax principles, the structure of the common consolidated tax base and connected apportionment mechanism (i.e. the mechanism upon which the consolidated tax based of the group will be divided among respective member states). Although the draft of the text of the directive has been concluded in 2008, the public discussion after its publication showed that there were still areas that needed detailed definitions, and therefore, the draft was sent back to the working group to amend the text.

In connection with the change in the Commissioner responsible for taxation, the CCCTB was granted the highest priority, and the final draft of the CCCTB directive was published in March 2011. It is necessary to point out that the implementation of the CCCTB is connected not only to the grouping for taxation purposes and consolidation but also to the problem of the tax-sharing mechanism, which has raised much discussion. The directive proposal suggests the allocation formula, i.e., the consolidated tax base should be shared among the members of the group based on micro factors. That new allocation rule would have an impact on EU Member States' budgets and therefore turned out to be the most difficult part of the negotiation of the CCCTB Directive. Therefore, the CCCTB has been the subject of many studies aimed at simulating the budgetary impacts on individual EU Member States as well as on welfare and the basic macroeconomic indicators (Fuest, Hemmelgarn and Ramb 2007, Van der Horst, Bettendorf and Rojas-Romagosa 2007, Devereux and Loretz 2008, Cline et al. 2010, Domonkos, Domonkos, Dolinajcová and Grisáková 2013, Nerudová and Solilová 2015).

However, in relation to the discussion of the reform of the EU budget, the CC(C)TB was not yet debated. A reference to the concept of a EU corporate income tax (EUCIT) and the concept of the CCCTB can be found in the study by Cattoir (2004). Subsequently, Begg et al. (2008) warned that the EUCIT would generate a much smaller tax base than the value added tax. Cattoir (2009) estimates the tax revenues from the EUCIT at 3 % of GDP, and

European Commission (2011) expects that a EUCIT of less than 2 % might generate tax revenue of EUR 15 billion in the European Union.

In June 2015, the Commission published an action plan which suggested implementing the CCCTB in two steps. First, only a mandatory common corporate tax base (i.e., unified rules for the tax base construction) should be implemented and only then, in second step, should the consolidation element together with apportionment mechanism be introduced (i.e., should the mandatory CCCTB be implemented).

The aim of this paper is to research the revenue potential of a mandatory CCTB (i.e. common corporate tax base including the element of cross-border loss offsetting) and mandatory CCCTB implementation (i.e. common consolidated corporate tax base including consolidation regime and apportionment mechanism) in the EU28 and the possible replacement of the VAT-based own resource and the GNI-based own resource by the CCCTB-based own resource, resp. the CCTB-based own resource.

2 The need for reform and the options

The main characteristics of the current system of own resources are the fact that they accrue to the EU automatically without the necessity of decisions at the level of the EU Member States. Concurrently, lacking fiscal sovereignty, the EU is not allowed to levy any own taxes or to incur debt. The above is regulated by Art. 269 of the Amsterdam Treaty and by Art. 310 and Art. 311 of the Treaty on the Functioning of the European Union.

The EU system of own resources has experienced a long period of development since 1958, when the expenditures of the EU were exclusively financed on an ad-hoc voluntary basis. The system of own resources as such was established in 1970 to make the EEC less dependent on ad-hoc transfers from member states. At that time, own resources represented sugar levies and custom duties (called traditional own resources). Subsequently, in 1979, the VAT-based own resource was introduced at the maximum rate of 1 % of a harmonized VAT base. The maximum rate was changed several times, either in reaction to rising EU expenditures or in reaction to the introduction of other own resource (GNP contribution). Currently, the cap is set at 0.3 %. In 1988, the GNP-based own resource was introduced at a uniform call-up rate updated yearly to balance the EU budget. This resource was replaced in 1999 by the GNI-based own resource, with the cap currently set at 1.23 %.

Despite all of the above changes the system underwent as stated by the High Level Group on Own Resources (2014), there have not been any significant changes in the last 25 years, and the system has become deeply entrenched. Based on the overview of the current literature provided by Schratzenstaller (2013) and Schratzenstaller et al. (2016), it is possible to identify the five most important points of criticism showing the necessity of reform.

First, as noted by the European Commission (2011) and Cipriani (2014), the system, which is based on the revenues sources' being in fact direct contributions by the Member States, leads to a situation of continuous restriction of the EU's financial autonomy. Moreover, such a structure enables Member States to aim at maximizing their net positions (i.e., decreasing contributions to and increasing revenues from EU) rather than value-added creation maximization, as noted by Heinemann, Mohl and Osterloh (2008) and Iozzo, Micossi and Salvemini (2008). Moreover, the share of own resources in the overall revenues decreased from 65% in 1976 to 12.9 % in 2016, according to the European Commission (2016). According to Adolf and Rohrig (2016), this situation goes against the founding treaties of the European Union, which envisioned a directly controlled funding

model. Second, there is no link between the system of own resources and reaching the aims set by EU policy. Schratzenstaller (2013) states that the design of the system is not reaching any of the goals of the Europe 2020 Strategy, i.e., smart, inclusive and sustainable growth. Third, as noted by Fuest, Heinemann and Ungerer (2015), the system of own resources can be characterized as very complicated, not only due to the various temporary or permanent correction mechanisms or the reductions granted to several Member States but also due to the complicated method of harmonized base calculation for the VAT-based own resource. Fourth, the current system of own resources lacks transparency, especially in relation to EU citizens. As noted by Fuest, Heinemann and Ungerer (2015), the implication is a deficit in democratic accountability, and according to Schratzenstaller (2013), it may be a threat to the credibility and acceptance of Member States' contributions to the EU budget. Finally, the construction of the system does not respect the ability to pay of individual Member States. The European Commission (2011a) has raised this issue mainly in connection with the UK rebate and correction mechanism. In this matter, Begg (2011) underlines that these correction mechanisms are motivated by unbalanced EU spending.

Considering the lack of a link between EU policy and the EU system of own resources, which can be considered one of the most serious criticisms of the current status quo, the most relevant benefit is the fact that sustainability-oriented future EU funding may help decrease the existing sustainability gaps in the tax systems in the EU, as stated by Schratzenstaller et al. (2016). Tax-based EU revenues can serve as a tool for reaching smart, sustainable and inclusive growth, as set by the Europe 2020 Strategy. Sustainability gaps are defined in detail by Schratzenstaller et al. (2016) as the increasing weight of taxes on labour in overall taxation, the decreasing progressivity of tax systems, the decreasing importance of Pigovian taxes, intense company tax competition, and issues with tax compliance and tax fraud.

The obligatory implementation of the C(C)CTB, as suggested by the action plan of the European Commission for fair and efficient corporate taxation in the European Union of June 2015, can effectively help decrease some of the sustainability gaps. C(C)CTB implementation in a directive form (i.e., obligatory implementation) should help establish fair tax competition, i.e., decrease the sustainability gap in the area of tax competition. First, the harmonization of the rules for the tax base construction will erase the differences between nominal and effective corporate tax rates (see Table 1 below). Therefore, governments as well as all companies subject to the C(C)CTB system will have symmetric information about the effective tax rate. This situation may prevent harmful effects arising

in situations in which companies have asymmetric information stemming from differences between the nominal and the effective corporate tax rate.

Table 1: Nominal and effective corporate tax rates in the EU in 2014

Country	Corporate tax rates in %	Effective average tax rate in %	Country	Corporate tax rates in %	Effective average tax rate in %
CZ	19.0	16.7	IT	30.9	24.0
AT	25.0	23.0	LV	15.0	14.3
BE	34.0	26.7	LT	15.0	13.6
CY	12.5	15.2	LU	29.2	25.5
EE	21.0	16.5	MT	35.0	32.2
FI	20.0	18.4	NL	25.0	22.6
FR	38.9	39.4	PT	30.0	27.1
DE	31.0	28.2	SK	22.0	19.4
EL	26.0	24.1	SI	17.0	15.5
IE	12.5	14.4	ES	35.3	32.6

Source: Spengel, Endres, Finke and Heckemeyer (2014).

Second, the mandatory introduction of a C(C)CTB is increasingly understood as a tool for the fight against tax evasion and tax fraud as is obvious from the action plan of the European Commission for fair and efficient corporate taxation in the European Union of June 2015. Closing the existing loopholes between the national corporate taxation systems through the implementation of unified rules (i.e., CCTB) represents an effective tool for decreasing base erosion and profit shifting. Therefore, CCTB implementation can significantly contribute to the decrease in the sustainability gap in the area of tax fraud. Moreover, completing the second implementation step (i.e., CCCTB) will have a significant impact on tax-planning strategies because, due to the establishment of the consolidation regime, it will no longer be possible for companies to apply tax-planning strategies through transfer pricing.

Finally, the introduction of the CCCTB would also contribute to decreasing the tax compliance gap. The draft of the CCCTB directive establishes the institution of a one-stop shop. This means that the CCCTB group (comprising members from different tax jurisdictions) is represented by a “single tax payer” and is administered by a “principal tax authority”. The one-stop shop system will lead to a significant decrease in the taxation compliance costs for the taxpayer and a decrease in the administrative costs for the tax administration.

Considering that C(C)CTB implementation represents one of the most important tools for preventing base erosion and profit shifting, C(C)CTB can also indirectly contribute decreasing the weight of labour taxation on overall taxation (European Commission, 2015). When corporate tax bases are not eroded by tax planning and the value added is taxed in the country where it has been generated, then the additional tax revenue can create space for a decrease in the taxation of labour. Therefore, C(C)CTB implementation can effectively contribute to a decrease of several sustainability gaps defined by Schratzenstaller et al. (2016).

2.1 Current situation of corporate taxation in the EU

Currently, two basic approaches to the calculation of the tax base of groups of multinational enterprises (MNEs) can be found in the EU. The majority of Member States tax the members of the group as separate entities, i.e., each entity declares its tax base in its country of residence. Moreover, intra-group transactions must fulfil the arm's length principle, i.e., the price must be set as though the transaction were being conducted between independent companies. As noted by Jacobs (2011), the allocation of profit to the branch of the entity, which, from a legal perspective, is the independent company, is sometimes complicated. Kumpf (1976) states that the separate entity approach forces entities to behave independently, even if they are members of groups. Solilova and Nerudova (2013) note that MNEs face the problem of correctly setting the transfer price, with an impact on taxable profit as well as the tax revenues of respective Member States. Moreover, Solilová and Nerudová (2013) argue that changes in the economic environment are forcing governments and MNEs to define the transfer prices more precisely. However, Picciotto (1992) sustains that the tax administration can adjust the tax base of the entity conducting transactions with related parties to better reflect open market conditions. The second approach to the calculation of the tax base of these groups represents the so-called single entity approach. Under this principle, all group members are treated as one single entity, and therefore, intra-group transactions are not considered. Another element connected with the single entity approach represents the allocation mechanism. As noted by Weiner (1999), under this approach, the group is treated as a single entity – all operations of the individual members of the group are integrated into the single unit. For this reason, the application of such a system requires the establishment of mechanisms for sharing the tax base between the jurisdictions in which the members of the group are residents. Weiner and Mintz (2002) note that the allocation formula represents the tool for the cross-border sharing of group tax bases. McDaniel (1994) adds that the allocation

mechanism is based on assumptions that are different from those of the separate entity approach and therefore has different economic impacts and generates different technical problems.

Currently, the corporate taxation systems applied within the EU can be categorized into four basic groups according to the consolidation method or the rules for group taxation (see Table 2).

Table 2: Consolidation regimes in the European Union

Full consolidation	Netherlands
Pooling	Denmark Germany Spain France Italy Luxembourg Austria Poland Portugal
Intra-group loss transfer	Ireland Cyprus Malta Sweden* Finland* United Kingdom
Group taxation scheme not available	Belgium Bulgaria Croatia Czech Republic Greece Hungary Slovak Republic Latvia Lithuania Estonia Romania Slovenia

Source: IBFD research platform

**group contributions*

Generally, it can be said that in majority of member states with the exception of Netherlands do not recognize the group for taxation purposes as single taxable entity. This means that losses within the group of companies are not treated by the same way as they would be within the one company. As can be seen from Table 2, sixteen member states are applying domestic system for group taxation, however the number of member states

applying loss relives systems in cross-border context is rather limited. Currently, cross-border loss offsetting within the group is allowed in Netherlands, France, Denmark, Italy, United Kingdom and Austria.

Table 2 clearly shows that the only country applying a full consolidation system (i.e., the group is treated as one single entity therefore cross-border loss offsetting is allowed) is the Netherlands. From January 2013, if a resident company directly or indirectly holds at least 95 % of the share capital and the voting rights of one or more other resident companies, upon a joint request, these companies can apply a fiscal unity.

The second group is represented by the corporate tax systems of nine EU Member States, under which each group member computes its taxable income separately and the total is accumulated by the parent company. This system is called pooling. In Denmark, the resident group-related subsidiaries of non-resident companies may apply for international consolidation, which means that either all group entities (both resident and non-resident) are included in the tax consolidation scheme or none of them is. Under this scheme, the losses of one company are set off currently against the profits of the other companies. For consolidation purposes, Spain defines a group as a resident parent company and subsidiaries owned at a rate of 75% or more (directly or indirectly) by the parent company. Germany allows a group of different legal entities to form one single unit for tax purposes. The profits are pooled in the hands of a controlling company, i.e., losses are set off against the profits realized within the group. France allows a group tax regime (tax consolidation) to be applied in the case of income and losses of resident companies within the group (the threshold is set at 95 %). Income and losses may be aggregated and taxed in the hands of the parent company of the group. Italy enables two types of consolidation – domestic and worldwide. The group may enter into the system only when consolidation covers all controlled companies. The effect of the worldwide consolidation is that the income of the controlled companies is imputed to the controlling company in proportion to its entitlement to the profits of the other resident controlled company. The threshold for fiscal consolidation in Luxembourg is set at 95 %. Fiscal consolidation means that the taxable income or loss of the subsidiary is added to the taxable income of the parent company, which is taxed as the aggregate taxable income. In Austria, parent companies and their subsidiaries may opt for consolidated income taxation if the parent exercises financial control over the subsidiary, which is presumed if the parent owns 50 % of the capital and voting power in the subsidiary. In Poland, the parent company must own 95 % of the shares of its subsidiaries to form a tax group. The taxable base of the tax group represents the difference between the aggregated profits and the aggregated losses of all companies. The threshold for creating a qualifying group of companies, which may elect to be taxed

under a special regime for group tax treatment, is set at 75 % in Portugal. Under the group regime, all profits and losses of each member of the group are pooled.

A third group is created by seven countries. Under intra-group loss transfer, group members may transfer their losses to a profitable member of the group for the immediate offset. However, Sweden and Finland apply intra-group loss transfer through group contributions. These payments constitute taxable income for the recipient as well as tax-deductible costs for the payer, which means that the offset of the loss is connected with the cash flow. Ireland distinguishes among between various types of groups according to the ownership level. Losses can be transferred only when there is a consortium, which is defined as five or fewer companies owning at least 75 % of the ordinary share capital of a trading company or a holding company having 90 % of the subsidiaries in Ireland or in the EU. Cyprus allows the offsetting of group losses, provided that there is a 75 % parent-subsidiary relationship. Malta represents the country with the lowest threshold for creating a group for taxation purposes. It is set at 51%. Lithuania allows the transfer of losses within a group of companies, provided that a parent company holds at least two-thirds of the shares in a subsidiary company participating in the transfer of losses. The United Kingdom enables the transfer of losses only in the case of consortia that consist of 20 or fewer resident companies that together own 75% of a company.

The fourth group includes countries in which the offsetting of losses or group taxation schemes are not available to businesses.

Table 3 summarizes the thresholds which are currently applied in the case of full consolidation, pooling and intra-group loss transfer for loss offsetting or consolidation in individual member states.

Table 3: Shareholding thresholds in the European Union

Shareholding thresholds in the European Union			
> 95 %	> 90 %	> 75 %	> 50 %
France, Luxembourg, Netherlands, Poland	Finland, Ireland	Cyprus, Ireland, Spain, United Kingdom, Portugal	Austria, Denmark, Germany, Italy, Malta, Sweden

Source: IBFD research platform

2.2 CCTB and CCCTB as an option

The efforts to harmonize corporate taxation in the European Union go back to its foundation and can be characterized as unsuccessful altogether (Nerudová, 2014). First, in 1962, the European Commission suggested splitting the corporate tax rates and applying a different tax rate for retained and distributed profits. Furthermore, in 1970, the Temple Report suggested implementing a classical system of corporate taxation in EU Member States. Consequently, the European Commission tried to approximate the corporate tax rates – it elaborated a proposal on a common level of corporate taxation of between 45 % and 55 %, most recently, at a minimum corporate tax rate of 30 %. Based on the research of the Ruding Committee, the European Commission also proposed uniform tax base rules and a maximum corporate tax rate of 40 %. In connection with the fact that all of the harmonization efforts were somewhat perceived by the Member States as efforts to limit their fiscal sovereignty, the European Commission decided to try to harmonize only the provisions affecting the smooth functioning of the Internal Market (Kubátová, 1998).

As a consequence, there is not a harmonized corporate income tax system applied in the European Union (as in the case of the VAT) but rather a junction of different national tax systems, which increases the compliance costs of taxation and the loopholes for tax evasion, tax fraud and tax planning schemes. The situation in the European Union represents an example of fiscal divergence, as stated by Hitiris (1994). The harmonization process, which aimed to reach a unified taxation system (through the total direct harmonization of national tax systems), turned into a convergence and approximation of the taxation systems, as stated by Hitiris (1994) and Kubátová (1998), mainly through negative harmonization (i.e., rulings by the European Court of Justice) and indirect harmonization (i.e., the harmonization of corporate taxation through the harmonization of different areas of the law).

The research performed by the European Commission (2001) clearly showed that, in the situation in which companies with European activities face 28 different corporate taxation systems, the result is a decrease in economic effectiveness, generating additional taxation compliance costs and contributing to the lack of transparency and the existence of asymmetric information on the internal market. Moreover, the study revealed that one of the most significant determinants for companies' investment strategies was the corporate tax rate. With respect to the fact that the tax systems should be neutral, the European Commission proposed four possible models of corporate tax harmonization in 2001. Under the Home State Taxation system, corporations with "European" activities would adopt the rules that are valid in "the home country", i.e., the country in which the headquarter is

situated. The suggested CCCTB system supposes the introduction of common rules for tax base construction and the possibility of a consolidation scheme connected with the rules for the sharing of the group tax base. Under the European Union Corporate Income Tax (EUCIT), large multinational corporations would use a uniform consolidated tax base and a uniform corporate income tax rate within the EU. Finally, the Compulsory Harmonized Corporate Tax Base would introduce a uniform tax base for every company in the EU. With respect to the harmonization policy in the area of corporate taxation, the European Commission chose a twin-track strategy with a long-term target in the form of the introduction of the CCCTB for corporations with European activities. After more than ten years of work, the Commission published the CCCTB Directive proposal on 16 March 2011.

Until recently, corporate tax harmonization has been facing many obstacles and barriers. The most serious obstacle can be considered the political barrier ensuing from the unwillingness to harmonize tax provisions, which can cause obstacles to the smooth functioning of common market or market deformations. Traditionally, member states that have already lost their monetary sovereignties perceive tax harmonization attempts as a threat to their fiscal sovereignty. Moreover, the EU legislative framework itself also represents a very significant obstacle – harmonization measures must be introduced by the European Commission in the form of a directive to be legally binding for all EU member states and concurrently, the approval of directive in taxation matters require the unanimity.

Therefore, in June 2015, as a reaction to the base erosion and profit shifting that EU Member States are currently facing in the area of corporate taxation in the EU, the European Commission introduced the Action Plan for Fair and Efficient Corporate Taxation, announcing the re-launch of the CCCTB system (European Commission, 2015). The implementation should be performed in two steps. First, only the common corporate tax base (i.e., only the unified rules for tax base construction) should be implemented. The full CCCTB system, including the consolidation scheme and the mechanism for the allocation of the group tax bases, should be implemented in the second step. The European Union suggests a mandatory implementation of the CCTB system, mainly because the existence of two different taxation systems for corporations within the EU (i.e., the CCTB or CCCTB and the national tax system) could open space for speculation, tax fraud and various types of tax arbitration. It is necessary to highlight that contrary to the first harmonization efforts in the area of corporate taxation, currently, the C(C)CTB is understood not only as a tool for the significant improvement of the business environment but also mainly as a tool against corporate tax avoidance. This can make corporate taxation in the EU much more transparent and can help decrease aggressive tax planning, as noted

above. In addition, as stated by the European Commission (2016), the CCTB, together with the Anti-BEPS (against base erosion and profit shifting) Directive, also represents a framework for the implementation of many of the new standards agreed upon through the OECD in the BEPS project.

As a possible new own resource candidate for the EU budget, to date, the C(C)CTB has not been discussed in the literature. However, a discussion of the European Union Corporate Income Tax (EUCIT) can be found. As noted by Cattoir (2004), developing the EUCIT first requires a definition of a common (consolidated) tax base. According to the author, the tax base should be mandatorily applied to all companies or to a defined group of companies, and he expects the application of formulary apportionment. The author predicts that the tax base of the EU corporate income tax would be relatively limited and unpredictable. He concludes that the EU corporate income tax could not be used as the main or only resource of the EU and that it would most likely need to be complemented by other resources. Begg et al. (2008) note that, although the EUCIT is a viable option for own resource, it represents a much smaller tax base than the value added tax and is more volatile over the economic cycle. According to him, the EUCIT represents the option that is likely to be credible in the longer run and subject to agreement on a common consolidated tax base. Cattoir (2009) states that the EUCIT can bring important revenues (the author takes into account the total corporate income tax revenues in the EU, amounting to 3 % of GDP in 2008), but its susceptibility to the business cycle requires maintaining a robust system such as the residual GNI-based resource. (European Commission, 2011) expects that a EUCIT of less than 2 % on the national corporate income tax base could generate EUR 15 billion.

The extant literature on the CCCTB can be divided into three main strands. The first one is mainly focused on the general concept of the CCCTB and its implementation in national tax systems (Riedel and Runkel 2006, Mintz 2008, McLure 2008, Bettendorf et al. 2010, Trandafir 2011, Dankó 2012). The second stream of the CCCTB literature aims at the analysis of allocation formula factors with respect to the prediction of corporate income tax revenues (Pethig and Wagener 2003, Agúndez-García 2006, Mintz 2008, Tan 2010, Roggeman et al. 2012, Krchnivá 2014, Nerudová and Krchnivá 2016, Cobham and Loretz 2014, Eberhartinger and Petutschning 2014). The third stream of the current literature on the CCCTB focuses on the impacts of the introduction of the CCCTB system on the tax revenues of EU Member States (Fuest, Hemmelgarn and Ramb 2007, Van der Horst, Bettendorf and Rojas-Romagosa 2007, Devereux and Loretz 2008, Cline et al. 2010, Domonkos, Domonkos, Dolinajcová and Grisáková 2013, Nerudová and Solilová 2015, Solilová and Nerudová 2016). As noted above, none of the studies focuses on the CCCTB as

a possible new own resource candidate for the EU budget and its respective revenue potential.

It is necessary to note that, when considering the EUCIT as an own resource of the EU budget, the design of the tax-based system of own resources plays an important role (Heinemann, Mohl and Osterloh (2008)). The possible design of an EU-tax based system of own resources has been researched by Raddatz and Schick (2003). The authors discuss three possible designs. Under the so-called linked system, the tax would be levied on the EU level (i.e., full harmonization – the harmonization of both tax bases and tax rates), with the direct participation of the EU in the tax revenues. The second system, called the surcharge system, would require only the harmonization of tax bases, and the EU would levy a surcharge in addition to the existing national tax rates (i.e., non-harmonized). Finally, the so-called separation system would allow the EU to introduce a specific tax that has not been applied by any of the EU Member States before. In this paper, we develop this classification further and suggest a so-called remittance system. This remittance system foresees the replacement of VAT-base own resource (resp. GNI-based own resource) by the transfer of a part of corporate tax revenues from the CCCTB raised on the national level to the EU budget.

3 Calculation methodology

To research the revenue potential of the C(C)CTB, the information on companies in the EU contained in the Amadeus database was used. Update no. 2552 from December 2015 was used to gain the relevant data. The empirical analysis is following the methodology used by Nerudová and Solilová (2014, 2015, 2016). To simulate the allocation of tax bases in individual EU Member States after the obligatory implementation of the CCCTB, it was necessary to gain the data of companies that are fulfilling the two-layer cumulative condition contained in the proposal of the CCCTB directive (i.e., at least 50.01 % voting rights and more than 75 % ownership of the capital), conditioning the entrance to the consolidation and group taxation scheme. Accordingly, we have gained a dataset of 2,155,072 EU companies fulfilling the above described condition.

Subsequently, the dataset of companies was divided into two groups. The first group comprised 1,123,927 subsidiaries resident in individual EU Member States, the second group comprised 1,031,145 parent companies resident in individual EU Member States. Further, to apply formulary apportionment for the sharing of the group tax bases comprised in the CCCTB proposal (see equation 1), information on different financial indicators had to be gained, i.e., information on total sales, payroll, the number of employees and total assets. The formula can be expressed as follows:

$$shareX = \left(\frac{1}{3} \frac{S^X}{S^{group}} + \frac{1}{3} \left(\frac{1}{2} \frac{P^X}{P^{group}} + \frac{1}{2} \frac{E^X}{E^{group}} \right) + \frac{1}{3} \frac{A^X}{A^{group}} \right) * CCCTB \quad (1)$$

where S represents total sales, P is payroll, E stands for the number of employees, and A represents total assets.

It is necessary to note that data on some of the financial indicators are often missing in the Amadeus database. To avoid eliminating entities with missing information from the dataset, in accordance with Nerudová and Solilová (2014), we apply three methods for missing data imputation, i.e., regression, imputation and the Monte Carlo method, to impute the missing data with the aim of researching the most suitable method for missing data imputation in every Member State (i.e., the method that least distorts the allocation of the group tax bases across the EU Member States). It was necessary to perform this test separately for each individual Member State because the character of missing data and the

proportion of missing data in the overall data influence the suitability of each of the methods.

First, the regression method was applied to impute the missing data in the case of all individual member states. The equations below represent the linear regression model, which was employed to estimate the missing data, i.e., the number of employees, sales and payroll. The model can be expressed as follows:

$$\text{No.employees_imputed} = \text{koeficient}\beta_0 + \text{TFA} * \text{koeficinet}\beta_1 \quad (2)$$

$$\text{Operating_revenue} = \text{koeficient}\beta_0 + \text{TFA} * \text{koeficinet}\beta_1 \quad (3)$$

$$\text{Payroll} = \text{koeficient}\beta_0 + \text{No.employees_imputed} * \text{koeficinet}\beta_1 \quad (4)$$

As the independent variables in the model, tangible fixed assets (TFA) were used for the estimation of the number of employees (No.employees_imputed) and sales (Operating_revenue), and the number of employees was used for the estimation of payroll (Payroll).

The model above was also used for the estimation of missing data through a Bayesian model using an adaptive Metropolis-Hastings algorithm, i.e., the Monte Carlo method, which uses likelihood models including univariate normal linear regression with a distribution argument in the form of var (i.e., variances based on variables). The Monte Carlo method is primarily designed for fitting regression models; therefore, the regression specification is the same as in the previous method (regression). Once the regression specification was performed, the adaptive random-walk through Metropolis-Hastings algorithm was applied to obtain the Markov Chain Monte Carlo correlation (MCMC), which assumes that the missing data are random. To obtain reproducible results, the random numbers used were set based on the default setting (i.e., the default burn-in period of 2,500 iterations and the default MCMC sample size of 10,000 iterations). Then we performed a multivariate regression. In addition, by default, 95% equal-tailed confidence intervals are reported.

The third method, which was applied for all individual member states, represents the single imputation method. This method imputes the missing data by probable values. The missing information on sales was added to the information on the recorded tangible fixed assets (TFA_reported) and the ratio of average operational revenues (AOperR) to average

tangible fixed assets (ATFA) in the case of companies from the same industry sector. The relation is expressed in the following equation:

$$\text{Operating_revenue} = (\text{AOperR} \div \text{ATFA}) * \text{TFA_reported} \quad (5)$$

The missing data on the number of employees were added through the application of the information on recorded fixed tangible assets (TFA_reported) and the ratio of the average number of employees (ANoE) to average tangible fixed assets (ATFA) in the case of companies from the same industry sector. The relation is expressed in the following equation:

$$\text{No.Employees_imputed} = (\text{ANoE} \div \text{ATFA}) * \text{TFA_reported} \quad (6)$$

The missing data on payroll were added through the application of the imputed number of employees (No.Employees_imputed) and the ratio of average payroll (APayr) to average number of employees (ANoE) in the case of companies from the same industry sector. The relation is expressed in the following equation:

$$\text{Payroll} = (\text{APayr} / \text{ANoE}) * \text{No.Employees_imputed} \quad (7)$$

Finally, a sensitivity analysis was performed to determine the most suitable method for missing data imputation. Based on the results, we decided to impute the missing data through the regression model above for all individual Member States, with the exception of the United Kingdom, because this method does not allow to impute the data with the smallest deviation from the real data. In the case of the United Kingdom, the Monte Carlo method was applied because it turned out to be the method of imputing the missing data with the smallest deviation from the real data.

4 Revenue potential of the CCCTB and CCTB

4.1 Replacement of the VAT own resource

As noted above, a CCCTB-based own resource is suggested to be introduced within a remittance system. Accordingly a part of the corporate tax revenues arising from the CCCTB system in each member State should be paid as a contribution to the EU budget to replace the VAT own resource contributions. The results of our estimations are shown in Table 4.

Table 4: CCCTB revenue potential in the case of VAT-based own resource replacement

	CCCTB mil EUR	nominal tax rate 2015	CCCTB tax yield mil EUR	VAT own resource mil. EUR	% to reach current contribution from CCCTB tax base	% to reach current contribution from CCCTB tax yield
Austria	15 151.33	25.00	3 787.83	453.00	2.99	11.96
Belgium	19 803.89	34.00	6 733.32	508.60	2.57	7.55
Bulgaria	3 156.42	10.00	315.64	58.70	1.86	18.60
Croatia	4 632.63	20.00	926.53	63.00	1.36	6.80
Cyprus	43.53	12.50	5.44	23.00	52.84	422.72
Czech Republic	9 357.75	19.00	1 777.97	183.80	1.96	10.34
Denmark	19 154.84	23.50	4 501.39	279.50	1.46	6.21
Estonia	5 123.47	20.00	1 024.69	25.70	0.50	2.51
Finland	7 360.38	20.00	1 472.08	270.50	3.68	18.38
France	78 895.64	38.90	30 690.40	2956.40	3.75	9.63
Germany	50 457.67	31.00	15 641.88	3698.70	7.33	23.65
Greece	1 777.18	29.00	515.38	286.00	16.09	55.49
Hungary	5 879.28	20.90	1 228.77	118.10	2.01	9.61
Ireland	6 635.53	12.50	829.44	203.20	3.06	24.50
Italy	56 663.80	31.30	17 735.77	1760.10	3.11	9.92
Latvia	1 854.47	15.00	278.17	32.50	1.75	11.68
Lithuania	1 206.39	15.00	180.96	40.30	3.34	22.27
Luxembourg	3 963.59	29.20	1 157.37	38.50	0.97	3.33
Malta	252.16	35.00	88.26	10.60	4.20	12.01
Netherlands	75 266.62	25.00	18 816.65	818.60	1.09	4.35
Poland	16 265.76	19.00	3 090.50	445.10	2.74	14.40
Portugal	6 834.10	29.50	2 016.06	242.30	3.55	12.02
Romania	10 491.01	16.00	1 678.56	161.30	1.54	9.61
Slovakia	3 683.40	22.00	810.35	69.00	1.87	8.51
Slovenia	755.45	17.00	128.43	52.80	6.99	41.11
Spain	40 745.02	33.40	13 608.84	1382.00	3.39	10.16
Sweden	40 095.25	22.00	8 820.96	553.10	1.38	6.27
United Kingdom	325 455.31	20.00	65 091.06	2932.90	0.90	4.51
Total	810 961.89		202 952.69	17667.30		

Source: Amadeus database and own calculations

As can be observed, companies that are eligible for the CCCTB system could generate a tax base of EUR 810,962 mil in the entire EU (contrary to the EUR 15 bn expected by the European Commission for the EUCIT). To reach the current amount of VAT-based national contributions, Member States would have to remit part of their tax revenues from the CCCTB. The portion of overall corporate income tax revenues resulting from applying the national corporate income tax rate to the CCCTB remitted to the EU budget would be lowest for Estonia (2.51 %) and highest for Greece (55.49 %). Cyprus represents a special category. As shown in Table 4, Cyprus is able to generate only EUR 5.44 mil from the CCCTB, whereas its VAT-based contribution amounts to EUR 23 mil. Therefore, it is clear that in the case of Cyprus revenues from the CCCTB cannot replace the VAT-based own resource. The reason for this is the fact that formulary apportionment (see equation 1) allocates the group tax bases according to factors that are different from the residency of the member of the group. As shown in Table 4, Cyprus is a low-tax jurisdiction in the European Union, which is used in the tax planning of companies, which means that, very frequently, even companies that are resident in Cyprus do not have any economic presence in Cyprus. Therefore, in the case of a member of the CCCTB group, the tax base is not allocated according to the country of the residency of taxpayers but according to factors such as assets, sales, the number of employees or the amount of wages (i.e., if there is no economic presence in the country, then the tax base allocated is equal to zero).

Table 4 also simulates the “rate of remittance” to fully replace the VAT-based own resource i.e. how much from the nominal national corporate tax rate would in fact be “remittance rate”. The rate varies from 0.5 % in the case of Estonia to 16.09 % in the case of Greece. Again, Cyprus represents a special category, in which the rate would have to be 52.84 %, which means that the current nominal tax rate is unable to raise sufficient revenues to fully replace the contribution paid as the VAT-based own resource.

The results for the mandatory implementation of CCTB with the possibility of cross-border loss offsetting is shown in Table 5.

Table 5: CCTB revenue potential in the case of the VAT-based own resource replacement

	CCTB (incl. cross-border loss offsetting) mil EUR	nominal tax rate 2015	CCTB tax yield mil EUR	VAT own resource mil. EUR	% to reach current contribution from CCTB tax base	% to reach current contribution from CCTB tax yield
Austria	8 962.81	25.00	2 240.70	453.00	5.05	20.22
Belgium	22 646.75	34.00	7 699.90	508.60	2.25	6.61
Bulgaria	3 515.53	10.00	351.55	58.70	1.67	16.70
Croatia	1 764.69	20.00	352.94	63.00	3.57	17.85
Cyprus	0	12.50	0	0	0	0
Czech Republic	8 499.76	19.00	1 614.95	183.80	2.16	11.38
Denmark	18 744.71	23.50	4 405.01	279.50	1.49	6.35
Estonia	1 334.43	20.00	266.89	25.70	1.93	9.63
Finland	9 936.21	20.00	1 987.24	270.50	2.72	13.61
France	64 419.78	38.90	25 059.29	2956.40	4.59	11.80
Germany	43 608.33	31.00	13 518.58	3698.70	8.48	27.36
Greece	1 441.68	29.00	418.09	286.00	19.84	68.41
Hungary	2 481.85	20.90	518.71	118.10	4.76	22.77
Ireland	9 157.70	12.50	1 144.71	203.20	2.22	17.75
Italy	47 027.83	31.30	14 719.71	1760.10	3.74	11.96
Latvia	1 455.27	15.00	218.29	32.50	2.23	14.89
Lithuania	987.86	15.00	148.18	40.30	4.08	27.20
Luxembourg	9 030.40	29.20	2 636.88	38.50	0.43	1.46
Malta	51.57	35.00	18.05	10.60	20.55	58.73
Netherlands	81 996.87	25.00	20 499.22	818.60	1.00	3.99
Poland	9 275.70	19.00	1 762.38	445.10	4.80	25.26
Portugal	7 078.11	29.50	2 088.04	242.30	3.42	11.60
Romania	7 517.62	16.00	1 202.82	161.30	2.15	13.41
Slovakia	3 577.00	22.00	786.94	69.00	1.93	8.77
Slovenia	670.89	17.00	114.05	52.80	7.87	46.29
Spain	45 617.76	33.40	15 236.33	1382.00	3.03	9.07
Sweden	33 256.35	22.00	7 316.40	553.10	1.66	7.56
United Kingdom	390 624.74	20.00	78 124.95	2932.90	0.75	3.75
Total	834 682.20		204 393.81	17667.30		

Source: Amadeus database and own calculations

As can be observed, companies that are eligible for the CCTB system could generate a tax base of EUR 834,682.20 mil in the entire EU (contrary to the EUR 15 bn. expected by the European Commission). To reach the current amount of VAT-based national contributions, Member States would have to remit part of their tax revenues from the CCTB. The portion remitted to the EU budget would be lowest in the case of Luxembourg (1.46 %) and highest in the case of Greece (68.41 %). Cyprus represents a special category. As shown in Table 5, in the case of the CCTB, Cyprus would not generate a positive tax base. Therefore, it is clear that, in the case of Cyprus, revenues from the CCTB cannot replace the VAT-based own resource.

Table 5 also simulates the rate of “remittance” to fully replace the VAT-based own resource, otherwise how much from the nominal national corporate tax rate would in fact be the national contribution to the EU budget. The rate varies from 0.43 % in the case of Luxembourg to 20.55 % in the case of Malta.

4.2 Replacement of the GNI own resource

Assuming the same perspective, we also research the possibility that the CCCTB-based own resource will replace the GNI-based own resource. The results are shown in Table 6.

Table 6: CCCTB revenue potential in the case of the GNI-based own resource replacement

	CCCTB mil EUR	nominal tax rate 2015	CCCTB tax yield mil EUR	GNI own resource mil. EUR	10% replacement	% of transfer from CCCTB revenues	20% replacement	% of transfer from CCCTB revenues	30% replacement	% of transfer from CCCTB revenues
Austria	15 151.33	25.00	3 787.83	2 197.50	219.75	5.80	439.50	11.60	659.25	17.40
Belgium	19 803.89	34.00	6 733.32	2 864.40	286.44	4.25	572.88	8.51	859.32	12.76
Bulgaria	3 156.42	10.00	315.64	315.30	31.53	9.99	63.06	19.98	94.59	29.97
Croatia	4 632.63	20.00	926.53	294.60	29.46	3.18	58.92	6.36	88.38	9.54
Cyprus	43.53	12.50	5.44	107.70	10.77	197.94	21.54	395.89	32.31	593.83
Czech Republic	9 357.75	19.00	1 777.97	1 023.50	102.35	5.76	204.70	11.51	307.05	17.27
Denmark	19 154.84	23.50	4 501.39	1 737.70	173.77	3.86	347.54	7.72	521.31	11.58
Estonia	5 123.47	20.00	1 024.69	138.30	13.83	1.35	27.66	2.70	41.49	4.05
Finland	7 360.38	20.00	1 472.08	1 365.30	136.53	9.27	273.06	18.55	409.59	27.82
France	78 895.64	38.90	30 690.40	15 025.00	1502.50	4.90	3005.00	9.79	4507.50	14.69
Germany	50 457.67	31.00	15 641.88	21 737.70	2173.77	13.90	4347.54	27.79	6521.31	41.69
Greece	1 777.18	29.00	515.38	1 410.90	141.09	27.38	282.18	54.75	423.27	82.13
Hungary	5 879.28	20.90	1 228.77	700.80	70.08	5.70	140.16	11.41	210.24	17.11
Ireland	6 635.53	12.50	829.44	1 108.00	110.80	13.36	221.60	26.72	332.40	40.08
Italy	56 663.80	31.30	17 735.77	11 443.00	1144.30	6.45	2288.60	12.90	3432.90	19.36
Latvia	1 854.47	15.00	278.17	192.70	19.27	6.93	38.54	13.85	57.81	20.78
Lithuania	1 206.39	15.00	180.96	253.80	25.38	14.03	50.76	28.05	76.14	42.08
Luxembourg	3 963.59	29.20	1 157.37	171.40	17.14	1.48	34.28	2.96	51.42	4.44
Malta	252.16	35.00	88.26	49.40	4.94	5.60	9.88	11.19	14.82	16.79
Netherlands	75 266.62	25.00	18 816.65	5 493.30	549.33	2.92	1098.66	5.84	1647.99	8.76
Poland	16 265.76	19.00	3 090.50	2 787.00	278.70	9.02	557.40	18.04	836.10	27.05
Portugal	6 834.10	29.50	2 016.06	1 271.10	127.11	6.30	254.22	12.61	381.33	18.91
Romania	10 491.01	16.00	1 678.56	1 090.40	109.04	6.50	218.08	12.99	327.12	19.49
Slovakia	3 683.40	22.00	810.35	502.60	50.26	6.20	100.52	12.40	150.78	18.61
Slovenia	755.45	17.00	128.43	247.20	24.72	19.25	49.44	38.50	74.16	57.74
Spain	40 745.02	33.40	13 608.84	7 850.30	785.03	5.77	1570.06	11.54	2355.09	17.31
Sweden	40 095.25	22.00	8 820.96	3 219.60	321.96	3.65	643.92	7.30	965.88	10.95
United Kingdom	325 455.31	20.00	65 091.06	14 475.00	1447.50	2.22	2895.00	4.45	4342.50	6.67

Source: Amadeus database, Eurostat and own calculations

As is clear from Table 6, we cannot talk about a full replacement of the GNI-based own resource in the case of the CCCTB-own resource because the national tax revenues from the CCCTB in 6 Member States (Cyprus, Germany, Greece, Ireland, Lithuania and Slovenia) would not reach the amount of the contributions to the EU budget based on GNI. Based on this result, we have decided to simulate a model in which the CCCTB-based resource would only partially replace the GNI-based resource. The ceilings selected were 10 %, 20 % and 30 %. The results of the simulations show that, even at the level of 10 % contributions, Cyprus would most likely not be able to generate sufficient CCCTB revenues to replace the 10 % of GNI-based contribution through the CCCTB contribution. Similar to the previous section on the VAT-base replacement, CCCTB tax revenues would amount to EUR 5.44 mil, whereas 10 % of the GNI-based contribution would amount to EUR 107.70 mil. Another Member State with a similar problem is Greece, in which, at the level of 30 % of contribution, the CCCTB tax revenues would amount to EUR 515.38 mil., whereas 30 % of the GNI-based contribution amounts to EUR 423.27 mil., which means the remittance of 82.13 % of tax revenues from the CCCTB.

Taking into account the same perspective, the possibility that the CCTB-based own resource will replace the GNI-based own resource was researched as well. The results are shown in Table 7.

Table 7: CCTB revenue potential in the case of GNI-based own resource replacement

	CCTB (incl. cross-border loss offsetting) mil EUR	nominal tax rate 2015	CCTB tax yield mil EUR	GNI own resource mil. EUR	10% replacement	% of transfer from CCTB revenues	20% replacement	% of transfer from CCTB revenues	30% replacement	% of transfer from CCTB revenues
Austria	8 962,81	25,00	2 240,70	2197,50	219,75	9,81	439,50	19,61	659,25	29,42
Belgium	22 646,75	34,00	7 699,90	2864,40	286,44	3,72	572,88	7,44	859,32	11,16
Bulgaria	3 515,53	10,00	351,55	315,30	31,53	8,97	63,06	17,94	94,59	26,91
Croatia	1 764,69	20,00	352,94	294,60	29,46	8,35	58,92	16,69	88,38	25,04
Cyprus	0,00	12,50	0,00	107,70	0,00	0,00	0,00	0,00	0,00	0,00
Czech Republic	8 499,76	19,00	1 614,95	1023,50	102,35	6,34	204,70	12,68	307,05	19,01
Denmark	18 744,71	23,50	4 405,01	1 737,70	173,77	3,94	347,54	7,89	521,31	11,83
Estonia	1 334,43	20,00	266,89	138,30	13,83	5,18	27,66	10,36	41,49	15,55
Finland	9 936,21	20,00	1 987,24	1365,30	136,53	6,87	273,06	13,74	409,59	20,61
France	64 419,78	38,90	25 059,29	15025,00	1502,50	6,00	3005,00	11,99	4507,50	17,99
Germany	43 608,33	31,00	13 518,58	21737,70	2173,77	16,08	4347,54	32,16	6521,31	48,24
Greece	1 441,68	29,00	418,09	1 410,90	141,09	33,75	282,18	67,49	423,27	101,24
Hungary	2 481,85	20,90	518,71	700,80	70,08	13,51	140,16	27,02	210,24	40,53
Ireland	9 157,70	12,50	1 144,71	1108,00	110,80	9,68	221,60	19,36	332,40	29,04
Italy	47 027,83	31,30	14 719,71	11443,00	1144,30	7,77	2288,60	15,55	3432,90	23,32
Latvia	1 455,27	15,00	218,29	192,70	19,27	8,83	38,54	17,66	57,81	26,48
Lithuania	987,86	15,00	148,18	253,80	25,38	17,13	50,76	34,26	76,14	51,38
Luxembourg	9 030,40	29,20	2 636,88	171,40	17,14	0,65	34,28	1,30	51,42	1,95
Malta	51,57	35,00	18,05	49,40	4,94	27,37	9,88	54,74	14,82	82,11
Netherlands	81 996,87	25,00	20 499,22	5493,30	549,33	2,68	1098,66	5,36	1647,99	8,04
Poland	9 275,70	19,00	1 762,38	2787,00	278,70	15,81	557,40	31,63	836,10	47,44
Portugal	7 078,11	29,50	2 088,04	1271,10	127,11	6,09	254,22	12,18	381,33	18,26
Romania	7 517,62	16,00	1 202,82	1090,40	109,04	9,07	218,08	18,13	327,12	27,20
Slovakia	3 577,00	22,00	786,94	502,60	50,26	6,39	100,52	12,77	150,78	19,16
Slovenia	670,89	17,00	114,05	247,20	24,72	21,67	49,44	43,35	74,16	65,02
Spain	45 617,76	33,40	15 236,33	7850,30	785,03	5,15	1570,06	10,30	2355,09	15,46
Sweden	33 256,35	22,00	7 316,40	3219,60	321,96	4,40	643,92	8,80	965,88	13,20
United Kingdom	390 624,74	20,00	78 124,95	14 475,00	1447,50	1,85	2895,00	3,71	4342,50	5,56

Source: Amadeus database, Eurostat and own calculations

As can be seen from Table 7, full replacement of the GNI-based own resource in the case of the CCTB-own resource would not be possible because the national tax revenues from the CCTB in 7 Member States (Germany, Greece, Hungary, Lithuania, Malta, Poland, Slovenia, Cyprus) would not reach the amount of the contributions to the EU budget based on GNI. With respect to this fact, we decided to simulate a variant in which CCTB-based resource would only partially replace the GNI-based resource. The levels selected for possible replacement were set 10 %, 20 % and 30 %. The results of the simulations show, that already at the level of 30 % contributions, Greece would most likely be unable to generate sufficient CCTB revenues to replace 30 % of the GNI-based contribution through the CCTB contribution.

5 Conclusion

One of the most serious criticisms of the current status quo with respect to the EU budget is the lack of a link between EU policy and the system of own resources. The non-existence of a link between the attainment of smart, sustainable and inclusive growth and the EU budget results in the existence of sustainability gaps in the European Union as the increasing weight on labour taxation, the decreasing progressivity in tax systems, the decreasing importance of Pigovian taxes, intense company tax competition and tax compliance and tax fraud. The introduction of EU taxes can represent an efficient tool for, on the one hand, establishing the link between the Europe 2020 Strategy and the EU budget and, on the other hand, decreasing or closing the existing sustainability gaps.

This research reveals that the introduction of the CCTB and CCCTB can contribute to the decrease in the sustainability gap in the form of intense company tax competition (by erasing the difference between the nominal and effective corporate tax rates), tax fraud (by closing the existing loopholes between national corporate taxation systems through unified rules) and tax compliance (through the concept of the one-stop shop). Indirectly, the CCTB and CCCTB can also contribute to the decrease in the weight on labour taxation by decreasing base erosion and profit shifting and creating a space for a decrease in labour taxation.

To research the revenue potential of the CCTB and CCCTB, we have calculated the national tax bases that would be allocated to the EU Member States after the CCCTB implementation, based on the allocation formula contained in the draft of the directive. Using the Amadeus database, we have identified 2,155,072 EU companies that are eligible for entering into the CCCTB system. The missing information on some financial indicators necessary for the application of allocation formula was added to the dataset by applying methods for missing data imputation. The sensitivity analysis reveals that the most suitable method in the case of the UK is the adaptive Metropolis-Hastings algorithm whereas, in the case of the remaining EU Member States, it is regression.

Our model for the estimation of the revenue potential is based on the CCTB resp. the CCCTB-based own resource designed as a remittance system. The system expects that replacement of the VAT-base own resource (resp. the GNI-based own resource) by the transfer of part of the corporate tax revenues from the CCCTB raised on the national level to the EU budget.

The results of the research show that companies that are eligible for the CCCTB system could generate a tax base of EUR 810,962 mil in the entire EU and, in the case of the CCTB, EUR 834,682.20 mil. With respect to the VAT-based own resource replacement, the research reveals, that the portion remitted to the EU budget in the case of the CCCTB would be the lowest in the case of Estonia (2.51 %) and the highest in the case of Greece (55.49 %). However, Cyprus is able to generate only EUR 5.44 mil from the CCCTB, whereas its VAT-based contribution amounts to EUR 23 mil. Therefore, it is clear that, in the case of Cyprus, revenues from the CCCTB could not replace the VAT-based own resource. In the case of the CCTB, the portion remitted to the EU budget would be the lowest in the case of Luxembourg (1.46 %) and the highest in the case of Greece (68.41 %). In the case of CCTB implementation with the possibility of cross-border loss offsetting, Cyprus would not be able to generate a positive tax base.

With respect to the GNI-based resource replacement, the research reveals that the national tax revenues from the CCCTB would not reach the amount of the GNI contribution in Cyprus, Germany, Greece, Ireland, Lithuania and Slovenia. The simulations performed show that, even at the level of 10 % contributions, Cyprus would most likely not be able to generate sufficient CCCTB revenues to replace the 10 % of GNI-based contribution through the CCCTB contribution. In the case of CCTB implementation with cross-border loss offsetting, the research reveals that national tax revenues from the CCTB would not reach the amount of the GNI contribution in Germany, Greece, Hungary, Lithuania, Malta, Poland and Slovenia. Cyprus is not able to generate a positive tax base, and even at the level of 30 % contributions, Greece would most likely not be able to generate sufficient CCTB revenues.

To conclude, both the CCTB-based own resource and the CCCTB-based own resource would be able to fully replace the VAT-based own resource, with Cyprus being the only exception. However, neither the CCTB-based own resource nor the CCCTB-based own resource can be considered a sufficient resource to fully replace the GNI-based own resource. Therefore, we recommend considering the CCTB and CCCTB only in connection with the replacement of the VAT-based own resource.

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7 Project information

FairTax

FairTax is a cross-disciplinary four year H2020 EU project aiming to produce recommendations on how fair and sustainable taxation and social policy reforms can increase the economic stability of EU member states, promoting economic equality and security, enhancing coordination and harmonisation of tax, social inclusion, environmental, legitimacy, and compliance measures, support deepening of the European Monetary Union, and expanding the EU's own resource revenue bases. Under the coordination of Umeå University (Sweden), comparative and international policy fiscal experts from eleven universities in six EU countries and three non-EU countries (Brazil, Canada and Norway) contribute to FairTax research.

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