Development and Effectiveness of Controlled-Foreign-Company Rules

Empirical evidence from European multinational companies

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Abstract

This thesis studies the development of CFC rules and assesses the effect that CFC rules have on capital structure decisions of MNCs. CFC rules are an anti-tax-avoidance measure that aims to prevent profit shifting. If CFC rules are applied, income of a foreign affiliate is added to the tax base of the parent and, therefore, taxed at the tax rate of the parent's country of residence.

First, we review the development of CFC regimes in Europe, the US, and Canada (2000 - 2015). Second, we create a panel data set of European companies with parents headquartered in Europe, the US, or Canada (2004 - 2015). This data set, which contains financial and historical ownership data that is obtained from Amadeus and Orbis databases, respectively, is further used in econometric analysis.

Our empirical analysis suggests that a parent country's CFC rules have a negative effect on an affiliate's total debt-to-asset ratio and an increase in the strictness of CFC rules is associated with a further decrease in leverage. These findings also hold when we control for thin-capitalization rules and transfer pricing rules. Therefore, it can be argued that CFC rules make internal lending as a profit shifting channel less attractive for MNCs. Furthermore, the results suggest that also thin-capitalization rules and transfer pricing rules are effective in limiting profit shifting activities by European MNCs.

We find that since 2006, when the European Court of Justice issued a landmark decision in the Cadbury-Schweppes (C-196/04) case, the negative effect of CFC rules on an affiliate's leverage has weakened. Nevertheless, we argue that the role of CFC rules in corporate decision making should not be disregarded.

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Introduction

Differences in corporate income tax systems across countries give rise to international tax planning by multinational companies (MNCs). If we assume that the parent company is located in a high-tax home country and owns a subsidiary in a low-tax host country, then the parent would typically prefer to have its income taxed in the host country. However, it is important to consider how the home country treats its residents' foreign income. If the home country applies an exemption method, such income, either reinvested or repatriated, is taxed only in the host country and is tax-exempt in the home country. If a credit method applies, residents' repatriated foreign income is included in the parent's tax base and only a tax credit for taxes paid in the host country is allowed. It implies that the MNC loses the tax advantage for its repatriated income (Ruf and Weichenrieder, 2013, p. 2). Currently, the majority of developed countries applies an exemption method.

Profit can be shifted by manipulating transfer prices (Clausing, 2003; Huizinga and Laeven, 2007; Vicard, 2015), strategically allocating intangible assets across affiliates (Karkinsky and Riedel, 2012; Bräutigam, Spengel, and Streif, 2015), and adjusting capital structure within the group (Buettner, Overesch, Schreiber, and Wamser, 2012). Such profit shifting activities can erode corporate income tax (CIT) base of countries that impose a relatively high tax burden on companies. As a result, governments respond by introducing various anti-tax-avoidance measures in their tax legislations.

When considering these policy measures, a distinction between tax planning and tax avoidance should be drawn. Tax planning refers to minimization of tax burden that is legally acceptable, at least to a certain extent. For example, nationals of the European Union (EU) can benefit from the differences in the tax systems of the member states by freely choosing the country for their economic activities. Tax avoidance, on the other hand, is in conflict with EU law, as it involves transactions that aim to evade taxes and lack economic substance. For instance, establishing a pure letter-box company with an aim to shift profit can be classified as constituting tax avoidance. It is the risk of tax avoidance, and not of tax planning, that may justify anti-tax-avoidance measures that restrict the basic freedoms stipulated in the Treaty on the Functioning of the European Union (Helminen, 2013, pp. 134-136).

Controlled foreign company (CFC) rules, thin-capitalization rules, and transfer pricing rules are three most common anti-tax-avoidance measures (Egger and Wamser, 2015).

CFC rules are an anti-tax-avoidance measure that aims to prevent profit shifting from a firm's home country to low-tax jurisdictions by taxing the income of a firm's foreign affiliate. If certain criteria are met, income of the foreign affiliate is added to the tax base of the parent and, therefore, this income is taxed at the tax rate of the parent's country of residence. In this case, CFC rules override the tax-exemption method, so that the de facto credit method is applied.

Thin-capitalization rules restrict the amount of interest that can be deducted when calculating a company's taxable profit. Safe-harbour rules and earnings stripping rules are two common approaches for defining thin-capitalization rules. Under safe-harbour rules, the maximum amount of debt is specified by a fixed debt-to-equity ratio, and interest expenses are tax deductible for the debt only up to this amount. Under earnings stripping rules, the maximum amount of interest expenses that can be deducted relative to another variable, such as EBITDA, is specified.

Transfer pricing rules determine the conditions, such as transfer price, for intra-group transactions and affect the allocation of profit across related parties. According to the arm's length principle, transfer prices of intra-firm transactions must correspond to prices that would have been set by independent or unrelated parties.

Although these measures share a common goal of limiting abusive profit shifting and protecting the domestic tax base, they should be regarded as complementary policies rather than substitutes. Indeed, several European countries have introduced more than one anti-tax-avoidance measure in their tax legislations. The focus of our thesis is the development and effectiveness of CFC rules and their interconnectedness with thin-capitalization rules.

CFC rules as a useful legislative measure for countering tax avoidance have recently become an important element in the international tax policy debate. OECD/G20 (2015a) discusses the relevance of CFC rules in the prominent Base Erosion and Profit Shifting (BEPS) project, where a number of developing countries and other non-OECD and non-G20 countries are also participating. The project, which was finalized in October 2015, aims "to close gaps in international tax rules that allow multinational enterprises to legally but artificially shift profit to low or no-tax

jurisdictions" (OECD, 2015c). The BEPS project presents 15 Actions, where Action 3 is entirely devoted to recommendations on how to design effective CFC rules. As of 2015, more than 15 European countries had implemented CFC rules.

In 2006, the European Court of Justice (ECJ) issued a landmark decision in the Cadbury-Schweppes (C-196/04) case, which has substantially affected the development and applicability of CFC rules. The ECJ decided that the application of the UK CFC rules may be in conflict with the freedom of establishment principle that underlies the EU law. In response to the Cadbury-Schweppes case, member states of the European Economic Area (EEA) have implemented changes in their CFC rules so that, within the EEA, the rules can be applied to wholly artificial arrangements only.

We anticipate that if CFC rules are effective, MNCs should be less incentivised to use internal lending as a profit shifting channel. As a result, effectiveness of CFC rules may be assessed by analysing the effect that CFC rules have on capital structure decisions of MNCs.

We propose the following research question for our thesis:

Do controlled-foreign-company rules have an effect on capital structure of European multinational companies?

Furthermore, five research sub-questions help us structure our analysis:

1. Does the effect of CFC rules on capital structure depend on a country's corporate income tax rate?

2. Does the effect of CFC rules on capital structure depend on the tightness of a country's thin-capitalization rules?

3. Does the effect of CFC rules on capital structure depend on the strictness of a country's transfer pricing rules?

4. Has the Cadbury-Schweppes (C-196/04) case of 2006 weakened the effect of CFC rules on capital structure of European multinational companies?

5. Does substitution of the effective corporate income tax rate for the statutory corporate income tax rate change the estimated results?

We start by reviewing the development and design of CFC regimes in Europe, the US, and Canada. This review allows us to quantify and code strictness of CFC rules of each country across the period of our study. Furthermore, taking into account data availability issues, we create a panel data set of European companies with parents

headquartered in Europe, the US, or Canada (2004 - 2015), which merges information on historical ownership structures from Orbis data base with financial data from Amadeus data base. This data on CFC rules and European companies is used in regression analysis, where the dependent variable is an affiliate's total debt-to-asset ratio and the independent variables primarily represent CFC rules and other anti-tax-avoidance measures. In particular, we additionally control for thin-capitalization rules (section 5.1.) and transfer pricing rules (section 6.1.). We also include industry and parent fixed effects and year dummies in our model. In order to reduce potential omitted variable bias, we add firm-level and country-level control variables.

Up to now, most empirical studies on the effects of CFC rules have been limited to Germany (Ruf and Weichenrieder, 2012; Ruf and Weichenrieder, 2013; Egger and Wamser, 2015), and our contribution to the existing literature is to extend such analysis to Europe.

Our empirical analysis suggests that CFC rules do have an effect on capital structure of European multinational companies. In particular, a parent country's CFC rules have a negative effect on an affiliate's total debt-to-asset ratio and an increase in the strictness of CFC rules is associated with a further decrease in leverage. Additionally, we find that in high-tax countries an affiliate's total debt-to-asset ratio is less responsive to changes in the strictness of CFC rules. The estimated coefficients on explanatory variables representing CFC rules remain statistically significant also when we control for thin-capitalization rules and transfer pricing rules. Therefore, it can be argued that CFC rules make internal lending as a profit shifting channel less attractive for MNCs.

When examining the aftermath of the Cadbury-Schweppes (C-196/04) case, we find that, relative to the years preceding the case, the negative effect of CFC rules on an affiliate's leverage has weakened. Nevertheless, we argue that the role of CFC rules in corporate decision making should not be disregarded, as the estimated coefficients on the explanatory variables representing CFC rules remain statistically significant.

We draw further conclusions about the effects of other anti-tax-avoidance measures - thin-capitalization rules and transfer pricing rules - on an affiliate's leverage. When modelling thin-capitalization rules, we distinguish between safe-harbour rules and earnings stripping rules.

Given the widespread usage of safe-harbour rules across European countries and theoretical and empirical findings of other studies, we expect that safe-harbour rules are effective in reducing leverage and, in turn, profit shifting activities by MNCs. Earnings stripping rules, on the other hand, are less common and empirical evidence on their effects on leverage is somewhat limited; therefore, before performing an in-depth analysis, the expected effect of earnings stripping rules on leverage remains ambiguous. With respect to transfer pricing rules, we expect that the rules effectively reduce international profit shifting, but the expected effect on leverage is uncertain.

We find that safe-harbour rules have a statistically significant negative effect on an affiliate's leverage, while, in contrast, the relationship between earnings stripping rules and an affiliate's leverage is positive. The effect of transfer pricing rules on an affiliate's leverage is also positive, similarly as for earnings stripping rules. Overall, our results suggest that thin-capitalization rules and transfer pricing rules are effective in limiting profit shifting activities by European MNCs.

This thesis is organized in six sections. Section 1 introduces the main concepts of CFC rules and provides a systematic overview of the development of CFC rules and thin-capitalization rules in Europe. Section 2 reviews the existing literature on CFC rules and thin-capitalization rules. In section 3, we present the main regression model. Section 4 contains descriptive statistics on our data set. In section 5, we display and analyse the obtained empirical results. The regression model is extended in section 6. Final remarks are provided in Conclusions.

1. Anti-tax-avoidance measures

In order to limit corporate tax base erosion that can result from tax planning and profit shifting activities, parent countries of MNCs introduce anti-tax-avoidance measures that include general anti-tax-avoidance provisions and more specific provisions, such as CFC rules, thin-capitalization rules, and transfer pricing rules (European Commission, 2015). The main purpose of anti-abuse legislation is not to raise additional corporate taxation revenue but rather to protect the country's fair tax base (OECD, 2015a, p. 13). In this section, we focus on the main concepts and development of CFC rules and thin-capitalization rules. Transfer pricing rules are touched upon in section 6.1.

1.1. CFC rules

Even though the exact CFC regimes differ across countries, the fundamental principles that these rules are built upon are common (Lang, Aigner, Scheuerle, and Stefaner, 2004). The BEPS project by OECD/G20 is one of the sources that has outlined these principles in detail and developed recommendations for designing more effective CFC regimes. The following sections are primarily based on the aforementioned OECD/G20 (2015a) guidelines.

1.1.1. Applicability of CFC rules

CFC rules are an anti-tax-avoidance measure that gives the tax authority of the parent country of the MNC the right to tax profit of an affiliate. If applied, CFC rules override the tax-exemption method and the affiliate's income is attributed to its parent (Haufler, Mardan, and Schindler, 2016, p. 2). Applicability of CFC rules is determined in accordance with several criteria. These criteria typically specify the definition of CFC, effective level of taxation threshold, and the type of income that is subject to the rules.

Types of foreign entities and concept of control

There are two main criteria that define what constitutes a CFC: first, the type of a foreign entity that would qualify as a CFC; second, whether the parent has sufficient influence or control over the foreign entity.

OECD (2015a) recommends to adopt a broad definition of entities that are covered by CFC rules. In other words, the definition of a CFC should be such that

various types of entities, whose income raises concerns about base erosion and profit shifting, are addressed by the rules. Examples of such entities, besides corporate entities, are partnerships, trusts, and permanent establishments. Indeed, the CFC rules of France can apply to all foreign legal entities and foreign permanent establishments. Finland is another country that has extended its CFC rules to cover also foreign permanent establishments (IBFD, 1991-2015).

The definition of control over the foreign entity is specified in terms of the type of control that is required and the level of that control.

There are various types of control that a CFC regime can refer to, such as legal control, economic control, de facto control, and control based on consolidation. Legal control considers a resident's holding of share capital and uses it to assess the percentage of voting rights held in the foreign entity. However, the flexibility of corporate law can give corporations an opportunity to design artificial and complex share structures in a way that allows them to remain outside the scope of CFC rules. Economic control looks at a resident's rights to the profit and, in certain circumstances like dissolution or liquidation, rights to capital and assets. It should be noted though that the rules of economic control may be bypassed via group reorganisations that involve, for example, a creation of a new group holding company. Greece, Poland, and Turkey are among the countries that, in addition to other measures, refer to a shareholder's right to the profit when defining control (IBFD, 1991-2015). De facto control considers factors similar to those determining a company's tax residency, and usually requires considerable and sometimes even subjective analysis of the relevant circumstances. For instance, the CFC rules of Italy require that a shareholder exerts decisive influence over a foreign entity and the rules state conditions under which this requirement is satisfied (IBFD, 1991-2015). Control based on consolidation rests on accounting principles, such as IFRS, and looks at whether the resident company consolidates a foreign entity in its accounts.

To sum up, these control rules are often combined in order to prevent circumvention of a separate control requirement. OECD (2015a) recommends to combine at least legal and economic controls, as these two tests are rather mechanical in their nature and, therefore, do not impose prohibitively high administrative and compliance burden. Table 1, page 22, which provides an overview of CFC regimes in

Europe, the US, and Canada, confirms that most countries have opted to include various control requirements.

The aim, when setting the level of control threshold, is to capture all cases when the resident is able to exert sufficient influence over an affiliate. A control threshold of 50% is common; nevertheless, also other thresholds, such as 10% and 25%, are applied (see table 1, page 22). Furthermore, there is a general principle that the interests of minority shareholders are aggregated together, if it is determined that they are acting together to influence the CFC. "Acting in concert" test, analysis of party relationships, and the concentrated ownership requirement are some of the tests that can be used to verify whether minority shareholders are indeed acting together. The definition of control threshold should refer to both direct and indirect control, as the parent can exert influence over the affiliate even if it is held indirectly through a holding company. Indeed, this is the case for essentially all countries reviewed. Furthermore, while the threshold often refers to the ownership share of a particular shareholder, some countries, for example, Finland, Portugal, Russia, and the US, also require that resident shareholders control at least 50% of the foreign entity.

Low taxation requirement

Low taxation requirement seeks to establish whether a CFC has paid a sufficiently high rate of tax that allows it to remain exempt from CFC rules. Countries primarily employ two approaches for making the distinction. Under the low taxation approach, the low tax rate benchmark is specified. Under the jurisdictional approach, a black (white) list that discloses a set of countries that the parent country considers as jurisdictions of low (sufficiently similar) taxation is developed. The low tax rate threshold can be set either as a fixed tax rate (the method chosen by, for example, Germany, Hungary, and Turkey) or as a share of the parent country's corporate tax rate (as currently done by Finland, Lithuania, Poland, Sweden, and other countries). Furthermore, this benchmark can be compared to either the statutory tax rate of the CFC jurisdiction or the effective tax rate paid by the CFC (Lang et al., 2004, p. 20). OECD (2015a) recommends the usage of the effective tax rate, as it reflects the CFC's actual tax burden more accurately. Table 1, page 22, indicates each country's low taxation threshold and the basis for this threshold.

Definition of CFC income

OECD (2015a) refers to "CFC income" as the income attributable to the controlling parties of the parent jurisdiction under CFC rules and recommends that it captures the part of income that raises base erosion and profit shifting concerns. However, each jurisdiction, depending on its policy objectives, can freely select rules and measures for specifying its own definition of CFC income. In general, jurisdictions face the trade-off between preventing avoidance of domestic tax and supporting domestic taxpayers in international competition. A balance is often reached by subjecting only passive income of foreign affiliates to domestic taxation (Lang et al., 2004, p. 22). It implies that a CFC regime usually is designed so as to not interfere with genuine foreign industrial or commercial activities of domestic MNCs (Sandler, 1998, p. 9).

OECD (2015a) distinguishes among three different approaches of how to define CFC income.

First, a common approach under categorical analysis is to divide income into several categories, which are then used to determine CFC income. These categories can be based on, for example, legal classification, relatedness of parties, and source of income. Legal classification distinguishes among income categories such as dividends, interest income, insurance income, royalties, intellectual property income, sales income, and other. In contrast, related party test seeks to determine income that has been earned from a related party, since such income is regarded as more likely to be shifted. Finally, the source of income classification focuses on where the income was earned and considers income earned from jurisdictions other than the CFC jurisdiction as more likely to raise base erosion and profit shifting concerns.

Second, substance analysis considers whether the CFC had the ability to generate the income itself, given the underlying substance, such as labour force, assets, and risks of the CFC. However, such analysis is difficult and expensive to administer, as it requires an in-depth analysis of the CFC's circumstances.

Third, excess profit analysis defines CFC income as income in excess of a "normal return" earned in a low-tax jurisdiction, and this analysis might be particularly relevant for income arising from transactions related to intellectual property. However, currently there is no CFC regime that uses this approach in practice.

The overarching issue is whether jurisdictions choose to apply the previously described approaches for defining CFC income on an entity-by-entity basis or on a transactional basis.

Under the entity approach, either all or none of the income is attributed to the controlling parties, depending on whether a pre-set threshold, defined in terms of attributable income as a percentage of the total income of the foreign entity, has been exceeded or whether the foreign entity engages in activities specified in CFC rules. Although this approach can be advantageous due to its relatively lower administrative and compliance costs, attributing either all or none of an affiliate's income makes the entity approach both over-inclusive and under-inclusive. Currently, the entity approach is employed by, for example, Finland, France, Greece, and Norway (IBFD, 1991-2015).

Under the transactional approach, in contrast, only the stream of income that has been determined as falling within the definition of CFC income is attributed to the controlling parties. By examining each stream of income separately, this approach is more accurate in targeting specific types of income that raise base erosion and profit shifting concerns. However, relative to the entity approach, such a detailed analysis is more costly for both tax administrators and companies. Canada, Germany, and Spain, among other countries, use the transactional approach (IBFD, 1991-2015).

Rules for computing and attributing income

There are two considerations for estimating the income of a CFC that is to be attributed to the parent: first, which jurisdiction's rules should be applied and, second, how CFC's losses are treated. As recommended by OECD (2015a), the rules of the parent jurisdiction should be used for computing the attributable CFC income. Furthermore, an offset of CFC losses should be allowed only against the profit of that CFC (as permitted by, for example, Iceland and Sweden) or CFCs within the same jurisdiction. The alternative approach would be to allow an offset of CFC losses against the profit of the parent or CFCs in other jurisdictions; however, that might encourage manipulation of losses and lead to base erosion.

When establishing which shareholders should have the CFC income attributed to them, it is recommended that the attribution ownership threshold is linked to the minimum control threshold (OECD, 2015a). The share of the income to be attributed to each shareholder is computed on a pro rata basis. In general, the calculations take into account, first, the shareholder's ownership proportion and, second, the actual

period of ownership or influence (Rohatgi, 2007, pp. 186-187). The attributed CFC income should be taxed at the rate of the parent jurisdiction; however, jurisdictions can decide upon when and how such income is to be included in a shareholder's accounts. As an example, the CFC rules of Germany attribute certain CFC income to the taxable income base of German shareholders and thereby the CFC income is taxed at the applicable CIT rate of Germany, and the income must be attributed in the fiscal year following the fiscal year in which the foreign entity earned the income (Deloitte, 2014).

Exemptions and threshold requirements

Tax administrators can restrict the applicability of CFC rules by introducing various exemptions and threshold requirement, for example, a de minimis CFC income threshold and an anti-avoidance requirement. The main benefits of such exemptions and threshold requirements are, first, to make CFC rules more targeted towards companies that represent high level of risk of profit shifting and, second, to reduce the administrative burden by limiting the number of companies that are subject to CFC rules.

The de minimis rule states that, if CFC income is below a specified threshold, an affiliate's income is not attributed to the parent's taxable income. As reported by OECD (2015a), countries define the threshold in terms of whether affiliate's attributable income is less than either a specified percentage of a CFC's income or a fixed monetary amount of a CFC's income or whether the taxable profit is less than a fixed amount. For example, the de minimis threshold set by Spain is 15% of a CFC's net profit or 4% of a CFC's total revenue, while the UK and Poland have set the threshold in terms of a fixed amount of a CFC's income – GBP 50 000 and EUR 250 000, respectively (IBFD, 1991-2015). The de minimis threshold should be accompanied with an anti-fragmentation rule that restricts companies' ability to remain under the threshold by creating several foreign affiliates and splitting CFC income among them.

The anti-avoidance requirement specifically addresses cases where a company has carried out transactions or created structures with intention to avoid taxes. This requirement allows the companies without a detected tax avoidance motive to remain outside the scope of CFC rules. The CFC rules of France serve as an example: the rules specify that, if localization of the foreign entity is not motivated by tax avoidance, CFC rules do not apply (IBFD, 1991-2015).

Rules to prevent or eliminate double taxation

In the context of CFCs, there are at least three settings where concerns about double taxation may arise: first, when the attributed CFC income is taxed in both the foreign jurisdiction and the parent jurisdiction; second, when the same CFC income is subject to CFC rules of more than one jurisdiction; third, when a CFC pays out dividends from income that has already been attributed to the resident controlling parties under CFC rules or in the case of a resident shareholder's disposal of CFC shares. CFC rules should contain provisions that ensure that application of the rules does not lead to double taxation in the aforementioned or other situations (Lang et al., 2004, p. 24).

As suggested by OECD (2015a), a credit for foreign taxes actually paid should be used to eliminate double taxation in the first two settings. Foreign taxes actually paid should include all taxes that a CFC has paid on the income in question, but only those taxes that are not eligible to a refund or reimbursement. Withholding taxes can also be taken into account. Many jurisdictions, including Denmark, Italy, and Sweden (Deloitte, 2014), indeed provide an indirect foreign tax credit, which credits taxes paid by the foreign affiliate, instead of using the deduction method that reduces the tax base that is subject to residence tax.

Double taxation in the third setting should be eliminated by exempting dividends and gains on disposal of CFC shares from taxation, if income of a CFC has already been subject to CFC rules; however, it is up to individual jurisdictions to tailor the recommended treatment of dividends and gains to ensure coherence with domestic law, including the existing participation exemptions.

It is possible that a CFC's income is taxed under the CFC rules of multiple jurisdictions, and OECD (2015a) expects such situations to become more widespread in the future. In order to ensure elimination of double taxation in such instances, priority should be given to the CFC rules of the jurisdiction whose resident shareholder is closer to the CFC in the ownership structure. Furthermore, foreign tax credit should recognize and provide relief for the taxes paid also in the intermediary jurisdictions.

Finally, tax treaties typically address elimination of double taxation in various situations and with respect to different income classes; therefore, countries should ensure that their CFC regimes and provisions of tax treaties are not contradictory. As

noted by Lang et al. (2004), the compatibility of CFC regimes and tax treaties is a subject of disputes in many countries.

1.1.2. Cadbury-Schweppes (C-196/04) case

Member States of the EU have to comply with the EU law when applying CFC rules. In particular, jurisdictions need to take into account the non-discrimination principles embodied in the EU primary and secondary law, especially the Parent-Subsidiary Directive (Lang et al., 2004, p. 38).

A turning point in the development of CFC rules was the decision of the ECJ in the Cadbury-Schweppes (C-196/04) case of 12 September 2006. The ECJ decided that application of the UK CFC rules may be in conflict with the freedom of establishment principle stated in the Treaty on the Functioning of the European Union.

The case concerned an MNC established in the UK that had two indirectly wholly-owned subsidiaries in Ireland. The business purpose of these subsidiaries was to raise and provide finance to subsidiaries in the Cadbury-Schweppes group. In 1996, one of the two subsidiaries was profitable and the profit was primarily generated from passive assets, while the other subsidiary made a loss. In 2000, the UK tax authorities, under CFC rules, claimed a corporation tax of GBP 8.6 million from the profitable subsidiary. The case was referred to the ECJ, which took the view that CFC rules are compatible with the Treaty on the Functioning of the European Union only if it is restricted to wholly artificial arrangements. European CFC rules can still be applied to non-European affiliates. It implies that despite the existence of tax motives, CFC rules cannot be applied to cross-border situations if, based on objective factors that can be verified by third parties, the establishment carries out genuine economic activity (Helminen, 2013; Murray, 2012).

OECD (2015a) points out several suggestions for ensuring that CFC rules are effective yet comply with the EU law. First, such compliance can be achieved if CFC rules include substance analysis that identifies wholly artificial arrangements so that CFC rules are applied only to them. Second, countries can apply CFC rules equally to both domestic and foreign subsidiaries and thereby ensure that there is no discrimination against non-resident subsidiaries. In fact, Denmark is the only EU member state that has chosen this approach. The third suggestion reflects recent developments in the ECJ's case law, meaning that CFC rules can also be applied to "partly wholly artificial" transactions. In other words, application of CFC rules to a

foreign subsidiary that is not wholly artificial can be justified, if there is enough proof that the transaction giving rise to the income is at least partly artificial and with a motive to avoid taxation. Also the Council of the European Union (2010) has provided member states of the EU with several guiding principles for designing cross-border CFC rules. See section 1.1.3. and table 2, page 29, for more details on how EEA countries have changed their CFC rules in response to the Cadbury-Schweppes case.

1.1.3. Analysis of CFC rules in Europe, the US, and Canada
Emergence of CFC regimes

Table 1, page 22, allows us to draw some general conclusions about CFC regimes in Europe, the US, and Canada from 2000 to 2015. Overall, it can be noted that countries do not tend to alter CFC rules frequently and the requirements for applicability of CFC rules can remain unchanged for an extended period of time.

When analysing the emergence of CFC regimes across countries, regional patterns and influences can be observed. The US introduced CFC rules, contained in Subpart F, in 1964. Canada followed suit in 1972 (the rules became effective in 1976), and, similarly as for Germany, which was the first European country to implement CFC rules, the design of the rules was based on the approach taken by the US (Peters, 2012, pp. 2-5). During the early 1980s, two other Western European countries, namely, France and the UK, introduced CFC rules. From 1990 to 1995, all Scandinavian countries, apart from Iceland, added CFC rules to their tax law. A similar development took place in Southern Europe – in 1995, CFC rules became effective in Portugal and Spain.

Several European countries have incorporated CFC rules into their tax law over the recent years: Iceland in 2010, Greece in 2014, Poland and Russia in 2015. This development reflects the growing international efforts, most notably led by OECD and the EU, to fight profit shifting and base erosion. For instance, the BEPS project (OECD, 2015a) addresses the importance of introducing or strengthening CFC rules, and countries have shown commitment to implement OECD standards and recommendations.

It can be argued that countries that impose high tax on companies are more likely to suffer from base erosion and, therefore, are more likely to perceive CFC rules as a valuable anti-tax-avoidance policy measure. Indeed, the data supports this line of

reasoning. In 2004, the first year that is represented in our data set, of the 14 countries that had implemented CFC rules (within Europe, Canada, and the US), 12 of them had a statutory CIT rate above the median of 28%. Only two countries, namely Lithuania and Hungary, had introduced CFC rules and had a CIT rate below the median. Regional differences within Europe might also account for this effect. Most Eastern European countries had CIT rates below the median, and the absence of CFC regimes might indicate that these countries opted to pursue some non-fiscal goals, for example, encouraging resident companies to set up foreign subsidiaries that allow them to access new markets for raw materials and sales (Rohatgi, 2007, p. 214). These countries also might have lacked the know-how and administrative capacity to design and successfully enforce CFC rules. Overall, this observation – that CFC regimes are more prevalent among countries with relatively high CIT rates – remains true across the years considered, but becomes somewhat less pronounced as more countries introduce the rules.

However, it is also evident that not all developed countries that have a relatively high statutory CIT rate have implemented CFC rules. Such decision might be related to countries' concerns about tax competitiveness. For example, it is insightful to take a closer look at the Benelux countries: Belgium, the Netherlands, and Luxembourg. These countries are recognized as financial centres for tax planning that provide fiscally beneficial regimes for intermediary holding, finance, or licensing companies (Rohatgi, 2007, pp. 299, 308-310). These preferential tax regimes aim to attract offshore business activities, holding companies, investment funds, and foreign direct investment. Therefore, it can be argued that for these countries an introduction of CFC rules would not fit their positioning in the international tax landscape.

Responses to Cadbury-Schweppes (C-196/04) case

As discussed in section 1.1.2., the Cadbury-Schweppes case and the corresponding ECJ ruling in 2006 has been a turning point in the development and applicability of CFC rules in EEA countries, and countries have altered their CFC rules not only in response to the ruling, but also in anticipation of it. Table 2, page 29, summarizes the year and main elements of each country's response to the Cadbury-Schweppes case. When analysing the changes and provisions introduced across the jurisdictions, some common patterns can be observed.

In particular, most EEA countries do not apply CFC rules to a controlled foreign entity that resides in another EEA country. This exemption, however, is conditional on the foreign entity not being a wholly artificial arrangement, which means that an entity needs to pass the genuine economic activity test. Some countries have specified additional requirements for the exemption to apply. For example, the CFC rules of Germany, Greece, Iceland, and Portugal require that there is an exchange of information between the respective tax authorities, while the rules of Portugal, Spain, and Sweden demand that the foreign entity is established for valid business reasons.

In contrast, Denmark has taken a different approach for ensuring that its CFC rules do not violate the non-discrimination principle embedded in the EU law. In 2007, instead of exempting foreign entities that reside in EEA countries, the country extended CFC rules to cover also purely domestic situations, even though the domestic situations do not pose tax avoidance threats. As argued by Schmidt (2014), there is still some uncertainty and doubts about whether the Danish CFC rules are indeed in line with the freedom of establishment.

Table 1 (page 22 to 28)**. An overview of CFC regimes in Europe, the US, and Canada (2000-2015)**

The table summarizes the key features of CFC regimes in Europe, the US, and Canada from 2000 to 2015. The information is based on the European Tax Handbooks by IBFD (1991-2015), Guide to Controlled Foreign Company Regimes by Deloitte (2014), Bräutigam et al. (2015), and Rohatgi (2007). While illustrative of the main elements of the regimes, this overview needs to be complemented with the actual anti-tax-avoidance legislations in order to apprehend the complexity and characteristics of each CFC regime. The explanatory notes that this table refers to can be found in Appendix A. In the first column, Year refers to the year of introduction of CFC rules. In Low taxation requirement section Home CIT rate refers to the CIT rate of the country that has CFC rules. Austria and Latvia have introduced some alternative CFC provisions; however, these countries are not reviewed in detail. The CFC regime of Estonia does not refer to resident companies and, therefore, is not reviewed in detail.

Country, Year	Time period	Requirements for applicability of CFC rules						Attribution of income under CFC rules		Countries exempted (apart from table 2)
		1. OWNERSHIP REQUIREMENT		2. LOW TAXATION REQUIREMENT			3. OTHER REQUIREMENTS			
		Threshold	Threshold refers to	Approach	Threshold	Basis for the threshold		Method	Notes	
Canada[a] **1976**	2006-2015[b]	1%+10%	Shares of any class: a resident shareholder owns 1% and, together with related persons, 10%; de jure control required	Low taxation	100%	Home CIT rate	-	Transac-tional	CFC rules refer to Foreign Accrual Property Income, which primarily consists of FDI income of a passive nature. Active business income is generally exempted if the foreign entity resides in a tax treaty country	-
	2000-2005	10%	Shares of any class owned by a resident; de jure control required	Low taxation	100%	Home CIT rate	-	Transac-tional		-
Denmark 1995	2007-2015	50%	Voting power held by a resident company	Low taxation	100%	Home CIT rate	The business is "mainly of financial nature": >50% of taxable income or >10% of assets are of financial nature	Entity	-	-
	2000-2006	25% / 50%	A resident company owns 25% of share capital OR 50% of voting power	Low taxation	75%	Actual tax paid / Hypothetical tax	The business is "mainly of financial nature": >1/3 of taxable income or >1/3 of assets are of financial nature	Transac-tional	Only net income from financial activities is taxed	-

Table 1 (continued)

Coun-try, Year	Time period	Requirements for applicability of CFC rules						Attribution of income under CFC rules		Countries exempted (apart from table 2)
		1. OWNERSHIP REQUIREMENT		2. LOW TAXATION REQUIREMENT			3. OTHER REQUIREMENTS			
		Threshold	Threshold refers to	Approach	Thres-hold	Basis for the threshold		Method	Notes	
Finland 1995	2009-2015	25%+50%	Capital or yield of the assets: a resident shareholder is entitled to 10% (25% since 2009) and Finnish residents are entitled to 50% (also refers to voting rights)	Mixed[c]	60%	Actual tax paid / Home CIT rate	-	Entity	Non-distributed income is attributed. No attribution or classification as a CFC if: (1) income principally derived from industrial, production or shipping activities, (2) the CFC engages in sales or marketing actitivies targeted at the local foreign market	Tax treaty countries[d]
	2000-2008	10%+50%		Mixed[c]	60%	Actual tax paid / Home CIT rate	-	Entity		Tax treaty countries[d]
France 1980	2005-2015	50% / 5%+50%	Share capital: 50% held by a French company OR 5% held by a French company and 50% by French or French-controlled companies	Low taxation	50%	Actual tax paid / Hypothetical tax	Specific distinctions and provisions exist for permanent establishments and legal entities (such as foreign subsidiaries); the concluded tax treaty is considered[e]	Entity	No attribution if: the foreign entity is engaged in real industrial or commercial activities in the source state (localization not motivated by tax avoidance)	-
	2003-2004	10% / 22.8 million EUR	A resident company owns 10% of share capital OR has made an investment in the entity at a cost price of at least EUR 22.8 million	Low taxation	2/3	Actual tax paid / Hypothetical tax	-	Entity	-	-
	2000-2002[f]	25%	Share capital held by a resident company	Low taxation[g]	Case-by-case analysis[g]		-	Entity	-	-

Table 1 (continued)

Country, Year	Time period	Requirements for applicability of CFC rules						Attribution of income under CFC rules		Countries exempted (apart from table 2)
		1. OWNERSHIP REQUIREMENT		2. LOW TAXATION REQUIREMENT			3. OTHER REQUIREMENTS			
		Thres-hold	Threshold refers to	Approach	Thres-hold	Basis for the threshold		Method	Notes	
Germany 1972	2001-2015	50%[h]	Capital or voting power owned by resident shareholders	Low taxation[i]	25%	Effective tax burden	-	Transac-tional	No attribution if: passive income does not exceed 10% of the foreign entity's gross income; however, the rules do apply if the attributable income exceeds a specified monetary threshold	-
	2000	50%		Low taxation	30%	Effective tax burden	-	Transac-tional		-
Greece 2014	2014-2015	50%	Shares, voting rights, capital rights or entitlement to the profit held by a resident taxpayer	Mixed[j]	50%	Actual tax paid / Hypothetical tax	(1) The CFC's shares are not traded on a regulated market, (2) over 30% of the CFC's net income before taxes is of financial nature	Entity	Non-distributed income is attributed	-
Hungary 1997	2011-2015	10%	Shares or voting rights held by at least one resident shareholder	Low taxation	10%	Effective tax burden	-	Entity	No attribution if: (1) the shareholder is controlled by non-resident taxpayers, (2) the majority of the foreign entity's income is not derived from Hungary, (3) the shareholder is traded on a stock exchange	Tax treaty countries[k]
	2010	10%		Low taxation	2/3	Actual tax paid / Home CIT rate	-	Entity	-	
	2004-2009	-	Participation by a resident taxpayer required	Low taxation	2/3		-	Entity	-	
	2001-2003	-		Low taxation	12%	Effective tax burden	-	Entity	-	
	2000	25%	Capital held by a resident taxpayer	Low taxation	10%	Effective tax burden	-	Entity	-	-

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Table 1 (continued)

Country, Year	Time period	Requirements for applicability of CFC rules						Attribution of income under CFC rules		Countries exempted (apart from table 2)
		1. OWNERSHIP REQUIREMENT		2. LOW TAXATION REQUIREMENT			3. OTHER REQUIREMENTS			
		Threshold	Threshold refers to	Approach	Threshold	Basis for the threshold		Method	Notes	
Iceland 2010	2010-2015	50%	Control or ownership held by resident taxpayers	Low taxation	2/3	Foreign CIT rate / Home CIT rate	-	Entity	-	Treaty countries[l]
Italy 2001[m]	2009-2015	A foreign entity is deemed to be controlled if a person: (1) holds the majority of shares, (2) holds sufficient votes to exert decisive influence, (3) exerts control according to contractual relationship		Mixed[n]	50%	Actual tax paid / Hypothetical tax	CFC rules can apply to countries not included in the Black list if (1) the actual tax paid is more than 50% lower than the hypothetical tax that would be levied in Italy, and (2) more than 50% of the CFC's income is passive	Entity	No attribution if: (1) the foreign entity primarily carries out an actual business in the foreign local market, (2) the participation in the foreign entity does not achieve the localization of income in tax haven countries	-
	2001-2008			Jurisdictional[n]	No threshold specified		-	Entity		-
Lithuania 2002	2002-2015	50% / 10%+50%	Shares or rights to dividends: 50% held by a resident shareholder OR 10% held by a controlling company, which, together with related parties, holds 50%	Mixed	75%	Foreign CIT rate / Home CIT rate	(1) The CFC is granted special CIT rate incentives, or (2) the CFC is organized in low taxation jurisdictions not included in the White list or the Black list[o]	Transactional	Determinants of attribution[p]: (1) nature of income and whether dividends are distributed, (2) the sources of CFC income, (3) income threshold specified in the de minimis test	White list and Black list of countries[o]
Norway 1992	2000-2015	50%	Ownership or control by resident taxpayers	Mixed[r]	2/3	Foreign CIT rate / Hypothetical tax	-	Entity	-	Treaty countries[s]

Table 1 (continued)

Country, Year	Time period	Requirements for applicability of CFC rules						Attribution of income under CFC rules		Countries exempted (apart from table 2)
		1. OWNERSHIP REQUIREMENT		2. LOW TAXATION REQUIREMENT			3. OTHER REQUIREMENTS			
		Threshold	Threshold refers to	App-roach	Thres-hold	Basis for the threshold		Met-hod	Notes	
Poland 2015	2015	25%	Share capital, voting rights, or share in the profit held by a resident taxpayer	Mixed	75%	Actual tax paid / Home CIT rate	(1) At least 50% of profit is derived from passive income and the Ownership and Low taxation requirements are met, OR (2) the foreign entity resides in a listed low-tax jurisdiction or in a country with which the EU has not concluded an information-sharing agreement	Entity	No attribution if: (1) the foreign entity's income does not exceed the de minimis threshold, (2) the foreign entity is established in a non-EEA country, if it meets the genuine business activity test and its passive income does not exceed 10% of total income	-
Portugal 1995	2000-2015	25% / 10%+50%	Capital, voting rights or the rights over income or net worth: 25% held by a resident participator OR 10% held by a resident participator and 50% by Portuguese residents	Mixed[t]	60%	Actual tax paid / Hypothetical tax	-	Entity	No attribution if: (1) at least 75% of the foreign entity's income arises from local farming, manufacturing or local commercial transactions, (2) its main acitivity is other than those specifically listed in the rules	-
Russia 2015	2015	25% / 10%+50%[u]	Share capital: 25% held by a tax resident OR 10% held by a tax resident and 50% held by Russian residents	Low taxation	75%[v]	Actual tax paid / Average home CIT rate	The foreign entity (1) is not a tax resident of Russia, and (2) is controlled by legal entities and/or individuals that are recognized as tax residents of Russia	Entity	Non-distributed income is attributed. De minimis threshold is specified. Exemptions: foreign entities that are non-profit organizations	Tax treaty countries[z], Eurasian Economic Area countries

Table 1 (continued)

Country, Year	Time period	1. OWNERSHIP REQUIREMENT		2. LOW TAXATION REQUIREMENT			3. OTHER REQUIREMENTS	Attribution of income under CFC rules		Countries exempted (apart from table 2)
		Thres-hold	Threshold refers to	Approach	Thres-hold	Basis for the threshold		Method	Notes	
Spain[aa] **1995**	2004-2015	50%	Capital, equity, results or voting rights held by a resident company	Low taxation	75%	Actual tax paid / Hypothetical tax	-	Transac-tional	No attribution if: the attributable passive CFC income is less than 15% of the CFC's net profit or 4% of the CFC's turnover	EU countries[ab]
	2000-2003	50%		Low taxation	75%	Actual tax paid / Hypothetical tax	-	Transac-tional		-
Sweden 1990	2004-2015	25%	Capital or voting rights held by a resident shareholder	Mixed	55%	Actual tax paid / Home CIT rate	-	Entity	-	White list of countries with some exceptions specified[ac]
	2000-2003	10%+50%	Capital or voting rights: 10% held by a shareholder and 50% held by Swedish residents	Low taxation	100%	Home CIT rate	The shareholder is liable to tax on his profit share in the non-resident company's country of residence	Entity	-	White list of treaty countries with some exceptions specified[ad]
Turkey 2006	2006-2015	50%	Share capital, voting rights or rights to the profit held by a resident company	Low taxation	10%	Effective tax burden	(1) At least 25% of the CFC's profit is passive, (2) taxes levied are similar to corporate or individual taxes, (3) the CFC's turnover of the year exceeds YTL 100 000	Entity	-	-

Table 1 (continued)

Country, Year	Time period	Requirements for applicability of CFC rules						Attribution of income under CFC rules		Countries exempted (apart from table 2)
		1. OWNERSHIP REQUIREMENT		2. LOW TAXATION REQUIREMENT			3. OTHER REQUIRE-MENTS			
		Thres-hold	Threshold refers to	Approach	Thres-hold	Basis for the threshold		Method	Notes	
United Kingdom 1984	2013-2015[ae]	-	Control by UK residents (broadly, at least 25% interest required)	Low taxation[af]	75%[af]	Actual tax paid / Hypothetical tax	-	Transac-tional	Tests for determining exempt CFCs: in addition to tests (1) to (3) (see below), the rules include profit margin test and sufficient taxation test (threshold: actual tax paid equals at least 75% of the hypothetical UK tax). The Gateway test aims to identify artificially diverted profit	-
	2010-2012	25%+50% (40%)	25% interest held by a shareholder and 50% of share capital or voting power held by UK shareholders (40% in some cases of joint ventures)	Low taxation	75%[ag]	Actual tax paid / Hypothetical tax	-	Entity	Tests for determining exempt CFCs: (1) exempt activities test, (2) motive test, (3) de minimis test, (4) test for residence in jurisdictions listed in "excluded countries regulations". Additional test: (5) acceptable distribution test (until 2009), (6) public quotation test (2002-2006)	-
	2000-2001	25%+50% (40%)		Mixed[ah]	75%[ag]	Actual tax paid / Hypothetical tax	-	Entity		-
United States[ai] 1964[aj]	2000-2015	10%+50%	10% of voting stock held by a shareholder and 50% of voting power or stock value held by the US shareholders	Low taxation	90%	Actual tax paid / Highest home CIT rate	-	Transac-tional	CFC rules refer to Subpart F income, which includes FBC income and FPHC income[ak]. A de minimis rule is specified. A CFC's income is not treated as Subpart F income if the effective foreign tax exceeds 90% of the highest CIT rate of the US	-

Table 2. Response to the Cadbury-Schweppes (C-196/04) case of 2006

The table summarizes the key changes in CFC rules that EEA countries implemented in response to or in anticipation of the ruling in the Cadbury-Schweppes case. Sources of information: the European Tax Handbooks by IBFD (1991-2015), Guide to Controlled Foreign Company Regimes by Deloitte (2014), Bräutigam et al. (2015), and Rohatgi (2007).

Country	Year	Changes in CFC rules
Canada	-	-
Denmark	2007	Changes introduced: (1) abolishment of low-taxation test, (2) extension of CFC rules to cover also Danish, not only foreign, subsidiaries, (3) inclusion of the total income of the CFC in the taxable base of the parent
Finland	2009	Exemption of a foreign entity that resides in the EEA if the entity (1) is in reality located in an EEA country and (2) carries out genuine economic activity
France	2005	If a foreign entity resides in the EU, CFC rules apply to artificial structures only
Germany	2008	Exemption of a foreign company that resides in the EEA if (1) the entity carries out genuine economic activity, (2) its passive income is derived in connection with genuine economic activity, and (3) the EC Mutual Assistance Directive or a similar agreement has been concluded with the EEA country in question
Greece	2014	Exemption of a foreign entity that resides in the EEA if (1) there is an agreement for an exchange of information between Greece and the EEA country in question and (2) it is deemed that the entity does not constitute an arrangement aimed at tax avoidance
Hungary	2008	Exemption of a foreign entity that resides in the EU or an OECD country and has real economic presence in the foreign country
Iceland	2010	Exemption of a foreign entity that resides in the EEA if (1) the entity is engaged in business activities in the foreign country and (2) Icelandic authorities can access tax information from the country in question
Italy	2009	Exemption of a foreign entity if the localization abroad is not deemed to constitute an artificial scheme for achieving undue tax advantages
Lithuania	-	No specific EEA clause is stated. However, the White list has included all EEA countries, except for Liechtenstein, since the introduction of CFC rules in 2002
Norway	2007	Exemption of a foreign entity that resides in the EEA if the entity (1) was properly established in an EEA country and (2) performs real economic activities in the foreign country
Poland	2015	Exemption of a foreign entity that resides in the EEA if the entity meets the genuine business activity test
Portugal	2012	Exemption of a foreign entity that resides in the EU and EEA if the entity (1) is incorporated and run for valid business reasons, (2) carries out agricultural, commercial or industrial activities, or provides services, and, (3) in the case of EEA countries, there is an exchange of tax information between Portugal and the country in question

Table 2 (continued)

Country	Year	Changes in CFC rules
Russia	-	-
Spain	2008	Exemption of a foreign entity that resides in the EU if the entity (1) is created for valid business reasons and (2) carries out genuine economic activity
Sweden	2008	Exemption of a foreign entity that resides in the EU if the shareholder can demonstrate that the entity (1) is established for business reasons and (2) carries out genuine economic activity
Turkey	-	-
United Kingdom	2007	Since 2007, CFC rules do not apply to that part of the profit of a CFC established in an EEA country that is attributable to a genuine economic activity carried out in the foreign country. Following the court case *Vodafone 2 v Commissioners for Revenue and Customs* (2009), CFC rules do not apply to a foreign entity that is established in an EEA state and carries out genuine economic activity
United States	-	-

1.2. Thin-capitalization rules

A company's capital structure affects its taxable profit and thus also the amount of tax payable. In order to protect the country's tax base, tax administrators can implement thin-capitalization rules that restrict the amount of interest that can be deducted when calculating a company's taxable profit. These rules aim to limit cross-border profit shifting activities through excessive internal debt and to protect the domestic tax base (OECD, 2012). The key aspects to consider when analysing thin-capitalization rules are the scope of the provisions, the determination of whether a company fulfils the criteria of thin-capitalization rules, the implications of the application of the provisions, and the existence of safeguard clauses (Finnerty, Merks, Petriccione, and Russo, 2007).

1.2.1. Safe-harbour rules and earnings stripping rules

There are two common approaches for defining thin-capitalization rules, as classified by OECD (2012).

Under the first approach, the maximum amount of debt is specified, and interest expenses are tax deductible for the debt only up to this amount. The maximum amount of debt can be determined by either the "arm's length" approach or the "ratio" approach.

If the "arm's length" approach is applied, the maximum amount of debt is defined as the amount of debt that a company would be able to borrow from an independent lender. In contrast, if the "ratio" approach is applied, the maximum amount of debt is established by a fixed debt-to-equity ratio (henceforth, safe-harbour ratio).

Under the second approach, sometimes referred to as an "earnings stripping" approach, thin-capitalization rules specify the maximum amount of interest expenses that can be deducted relative to another variable, such as EBITDA.

1.2.2. Analysis of thin-capitalization rules in Europe

An overview of thin-capitalization rules in Europe (2004-2015) is provided in table 3, page 32. In particular, the table summarizes the key descriptive elements of safe-harbour rules and earnings stripping rules. As of 2015, 30 European countries had implemented thin-capitalization rules, out of which 20 countries had safe-harbour rules, 7 countries had earnings stripping rules, and 3 countries - Bulgaria, Denmark and France - had both sets of rules.

According to our data set, approximately half of the countries that have implemented safe-harbour rules refer to total debt when specifying the safe-haven debt-to-equity ratio, and the other half - to related debt. Bulgaria has had earnings stripping rules throughout the time period considered; furthermore, Germany and Italy introduced earnings stripping rules in 2008. Since then, Greece, Portugal, and Spain have switched from safe-harbour rules to earnings stripping rules; Finland and the Slovak Republic have opted for earnings stripping rules when introducing thin-capitalization rules; and Denmark and France have introduced earnings stripping rules in addition to their safe-harbour rules.

Similarly as for CFC rules, table 3 suggests that countries do not tend to alter their thin-capitalization rules frequently.

Table 3. An overview of thin-capitalization rules in Europe (2004-2015)

The table summarizes the key aspects of thin-capitalization rules of European countries (2004-2015). European countries not included in the table did not have specific thin-capitalization provisions over the time period reviewed. Sources of information: the European Tax Handbooks by IBFD (1991-2015).

Country	Year	Safe-harbour (SH) rules		Earnings stripping (ES) rules	
		Safe haven debt-to-equity ratio	Total/Related debt	Specified threshold (%)	Threshold[1] refers to
Albania	2005-2015	4:1	Total	-	-
	2004	4:1	Related	-	-
Belgium	2012-2015	5:1	Related	-	-
	2004-2011	7:1	Total	-	-
Bulgaria	2007-2015	3:1	Total	75%[2]	EBIT
	2004-2006	2:1	Total	75%[2]	EBIT
Belarus	2013-2015	3:1	Total	-	-
Croatia	2005-2015	4:1	Related	-	-
Czech Republic	2009-2015	4:1	Related	-	-
	2008	2:1	Related	-	-
	2004-2007	4:1	Related	-	-
Denmark	2007-2015[3]	4:1	Total	80%	Income before taxation
	2004-2006	4:1	Total	-	-
Finland	2014-2015	-	-	25%	EBITDA
	2013	-	-	30%	EBITDA
France	2007-2015	1.5:1	Related	25%	Income before taxation
	2004-2006	1.5:1	Related	-	-
Germany	2008-2015	-	-	30%	EBITDA
	2004-2007	1.5:1	Related	-	-
Greece	2015	-	-	50%	EBITDA
	2014	-	-	60%	EBITDA
	2010-2013	3:1	Related	-	-
Hungary	2004-2015	3:1	Total	-	-

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[1] For earnings stripping rules purposes, EBITDA and income before taxation are adjusted for tax purposes.
[2] The deduction of interest expenses is limited to the total amount of interest income received plus 75% of the company's positive financial results.
[3] Additionally, deductibility of net financing expenses is limited to a cap computed as a percentage (specified each year) of the tax value of the company's business assets.

Table 3 (continued)

Country	Year	Safe-harbour (SH) rules		Earnings stripping (ES) rules	
		Safe haven debt-to-equity ratio	Total/Related debt	Specified threshold (%)	Threshold refers to
Italy	2008-2015	-	-	30%	EBITDA
	2005-2007	4:1	Related	-	-
	2004	5:1	Related	-	-
Latvia	2004-2015	4:1	Total	-	-
Lithuania	2004-2015	4:1	Total	-	-
Luxembourg	2004-2015	85:15	Related	-	-
Macedonia	2009-2015	3:1	Related	-	-
Monaco	2004-2015	0.5:1	Related	-	-
Netherlands	2004-2012	3:1	Total	-	-
Poland	2015	1:1	Total	-	-
	2004-2014	3:1	Total	-	-
Portugal	2015	-	-	50%	EBITDA
	2014	-	-	60%	EBITDA
	2013	-	-	70%	EBITDA
	2004-2012	2:1	Related	-	-
Romania	2005-2015	3:1	Total	-	-
	2004	1:1	Total	-	-
Russia	2004-2015	3:1	Related	-	-
Serbia	2004-2015	4:1	Related	-	-
Slovak Republic	2015	-	-	25%	EBITDA
Slovenia	2012-2015	4:1	Related	-	-
	2011	5:1	Related	-	-
	2008-2010	6:1	Related	-	-
	2006-2007	8:1	Related	-	-
Spain	2012-2015	-	-	30%	EBITDA
	2004-2011	3:1	Related	-	-
Switzerland	2004-2016	6:1	Total	-	-
Turkey	2006-2015	3:1	Related	-	-
United Kingdom	2004-2015	1:1[4]	Total	-	-

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[4] We follow the approach by Buettner et al. (2012), who argues that although the UK incorporated its thin-capitalization rules into transfer pricing rules in 2004, it still uses the safe haven debt-to-equity ratio as a guideline when applying the arm's length principle.

2. Literature review

2.1. Studies on CFC rules

From an optimal tax policy perspective, countries face a trade-off when implementing CFC rules. On the one hand, CFC rules help to protect the tax base and affect capital structure decisions of MNCs so that the excess leverage is limited. CFC rules can also attract foreign investment without substantially lowering the level of taxation on domestic MNCs. On the other hand, the rules decrease competitiveness and after-tax profit of domestic MNCs globally and, therefore, have a negative effect on the companies' investment decisions and economic activity (Schindler, 2015, p. 12).

Haufler et al. (2016) provide a theoretical analysis of CFC rules and thin-capitalization rules and determine the conditions under which they are a part of the optimal tax mix chosen by the government. In addition, the authors estimate the effect of economic and financial integration on the optimal policy mix. One of the main findings of the paper is that economic integration, which is characterised by a reduction in transaction costs for foreign direct investment (FDI), leads to stricter thin-capitalization rules and laxer CFC rules. Tightening of thin-capitalization rules becomes optimal, as it is more costly for a country to allow internal debt expenses to be deducted from the domestic tax base when the level of FDI by foreign-owned firms increases. However, since tightening of thin-capitalization rules increases the cost of capital of both foreign and domestic MNCs, the latter can be at least partly compensated by laxer CFC rules. Financial integration, which refers to a reduction in the costs of debt shifting to the tax haven, on the other hand, leads to tightening of both thin-capitalization and CFC rules. This increases the effective domestic corporate tax rate and prevents erosion of the tax base. To sum up, when the economic and financial integration is present, there is a clear incentive for tightening thin-capitalization rules, whereas the optimal response with respect to CFC rules is more ambiguous.

Unavailability of sufficiently detailed and publicly available financial data has been a major limiting factor for conducting international empirical studies of effectiveness of CFC rules. Most European studies have examined various effects of German CFC rules due to the fact that researchers can access the Microdatabase Direct Investment (MiDi) data base of the Deutsche Bundesbank (Ruf and Weichenrieder, 2012; Ruf and Weichenrieder, 2013; Egger and Wamser, 2015). MiDi is a balance-

sheet-based data base that contains information about foreign subsidiaries owned by German parents and includes detailed data on firms' equity ownership structure, internal lending, and financial position.

Ruf and Weichenrieder (2012) study the effect of German CFC rules on the outflow of passive investments into low-tax countries. The authors use subsidiary level panel data (1996 - 2006) and consider two types of passive investments: financial portfolio investments and loans granted to other affiliates. They find that low-tax jurisdictions, where the tax rate is below the safe haven threshold and, therefore, CFC rules apply, have become less attractive for allocation of passive investments. Egger and Wamser (2015) also quantify the impact of German CFC rules on the activity of multinationals. Their analysis is focused on MNC's real investment (fixed assets) in foreign countries and indicates that the applicability of CFC rules substantively reduces such investments and can be regarded as an increase in costs of capital. Therefore, both studies confirm that CFC rules have a significant impact on the operations of MNCs.

The paper by Altshuler and Hubbard (2002) investigates the international location decisions of the US financial services firms in relation to the Tax Reform Act of 1986. It is found that after the Act, which led to tighter anti-deferral provisions, differences in host country tax rates are no longer a determining factor of the allocation of assets among CFCs of the US MNCs. However, Mutti and Grubert (2009) show that the "check-the-box" regulation, introduced in 1997, has increased the number or hybrid entities that are created with intention to avoid CFC rules. Brinker and Sherman (2003) also note that, because of the mechanical nature of CFC classification tests, carefully structured entities are able to bypass CFC rules.

Several studies have analysed the impact of the Cadbury-Schweppes (C-196/04) case on effectiveness of CFC rules in member states of the EU and EEA. Barry and Healy-Rae (2010) consider the impact of various ECJ decisions on the FDI allocation decisions of MNCs. When analysing the effect of the Cadbury-Schweppes (C-196/04) case, they note that, as a result of the ECJ ruling, relatively more FDI will be directed to the low-tax EU countries.

Ruf and Weichenrieder (2013) follow up on this discussion and estimate to which extent the ECJ decision has affected allocation of passive assets in German MNCs. Their findings are in line with the assessment of Barry and Healy-Rae (2010) and indicate that, as a consequence of the Cadbury-Schweppes (C-196/04) case, the

attractiveness of low-tax EU countries as the destination for passive assets has increased relative to non-EU countries. For example, from 2005 to 2008, the amount of passive assets located in Cayman Islands shrank, while it increased in low-tax EU countries like Latvia, Estonia, Ireland, and Poland (Ruf and Weichenrieder, 2013, p. 7). However, the authors note that the evidence is weak and further analysis is necessary to ensure that the obtained results are systematic.

Implications of the Cadbury-Schweppes (C-196/04) case are also analysed in the study by Bräutigam et al. (2015). They challenge the widespread opinion that the ECJ's decisions lead to an increase in tax neutrality within the EU. It is argued that the EJC's ruling in the Cadbury-Schweppes (C-196/04) case led to a de-facto abolishment of CFC rules, which, in turn, contributed to the rise of the Intellectual Property (IP) box regimes. Under the IP box regime, reduced tax rates are applied to specific income related to IP. Although, according to the EU State aid rules, some characteristics of the IP box regimes might qualify as forbidden, 13 European countries had already introduced such regime by the end of 2015. The authors model four scenarios for future development of CFC rules and IP boxes in the context of capital and tax neutrality, and conclude that it is worthwhile to consider either abolishment of the IP box regimes or reintroduction of CFC rules (Bräutigam et al., 2015, pp. 13-19).

2.2. Studies on thin-capitalization rules

Thin-capitalization rules have been researched by several scholars and the issue of whether the rules significantly affect capital structure of MNCs is the central point of discussion in their studies.

Buettner et al. (2012) use a micro-level panel dataset (1996 - 2004) of German MNCs with foreign subsidiaries located in OECD countries and find that thin-capitalization rules, defined as safe-harbour rules, substantially reduce the tax-sensitivity of the internal debt. As estimated by the authors, when the rules are introduced, tax-sensitivity of the internal debt is reduced by about half, while tax-sensitivity of external debt increases. Although external leverage increases, it does not substitute for internal leverage perfectly, and the total indebtedness of an affiliate decreases.

Results of the empirical study Blouin, Huizinga, Laeven, and Nicodème (2014) also confirm that foreign thin-capitalization rules significantly affect capital structure

of foreign affiliates of MNCs and that thin-capitalization rules have an indirect effect on total, not only internal, leverage. Furthermore, thin-capitalization rules are also found to lower market value of a firm. This study is based on a dataset of foreign affiliates of the US MNCs and it covers the period from 1982 to 2004.

Ruf and Schindler (2015) in their paper discuss theoretical implications of thin-capitalization rules and review empirical evidence on their effectiveness in Germany. In theory, thin-capitalization rules are expected to restrict international debt shifting and decrease financial leverage of the domestic affiliates of MNCs. However, the rules weaken a country's position in competition for mobile capital due to increased costs of capital, which is particularly relevant for relatively small countries. While the authors' review of empirical studies suggest that thin-capitalization rules are effective in reducing the internal debt-to-assets ratios, there is no clear evidence of decrease in investment levels. This might reflect the ability of MNCs to increase external leverage and to circumvent the rules by exploiting preferred holding structures.

Gresik, Schindler, and Schjelderup (2015) develop a theoretical model for analysing the optimal thin-capitalization policy from the welfare perspective. The model suggests that implementation of earnings stripping rules alone, not in combination with safe-harbour rules, is the preferred thin-capitalization policy, which maximises the host country's national income. Furthermore, usage of earnings stripping rules has recently increased due to the overall impression that safe-harbour rules are ineffective. Thin-capitalization rules impose limitations to the amount of internal debt only, while earnings stripping rules create a trade-off between the amount of internal debt issued and the interest rate applied. The authors note that as a country moves from safe-harbour rule policy to earnings stripping rules, for the same amount of interest, MNCs are incentivised to reduce the transfer price on borrowing costs by lowering the interest rate applied and to increase the amount of internal debt.

As the review of empirical findings suggests, thin-capitalization rules are effective in reducing total leverage. However, as noted by Haufler et al., (2016), it still can be reasonable for governments to include CFC rules in their policy mix. Governments compete for attracting FDI; therefore, they would like to impose a relatively smaller effective tax burden on foreign MNCs than on domestic MNCs. As this cannot be achieved by thin-capitalization rules alone, CFC rules can be of use for bringing about the desired discrimination effect. Furthermore, Ruf and Schindler (2015)

suggest that one of the key advantages of CFC rules are that they not only increase tax revenue, but also do not harm a country's position in the international competition for FDI. On the other hand, CFC rules do place domestic MNCs at a competitive disadvantage relative to foreign MNCs. To sum up, thin-capitalization rules and CFC rules should not be regarded as substitutes but rather as complementary policies, and the chosen policy mix should reflect the objectives of the particular government.

3. Methodology

3.1. Introducing the model

We aim to assess effectiveness of European, the US, and Canadian CFC rules by employing a firm-level panel dataset that covers European companies over the time period from 2004 to 2015.[5] To the best of our knowledge, all previous empirical studies limit their analysis of effectiveness of CFC rules to a single country. Therefore, our methodological approach is not an exact replica of other authors' investigation method.

The starting point of the development of our methodological approach is the study by Buettner et al. (2012). They study thin-capitalization rules across OECD and EU countries over time, and we adapt the methodology of this international study for the analysis of CFC rules.

The main regression that helps us to answer the proposed research question is:

$$TDAR_{i,j,p,t} = \beta_1 CIT_{j,t}$$

1 $\left\{ + \beta_2 CFC_{D_{p,t}} + \beta_3 (CFC_{D_{p,t}} CIT_{j,t}) + \beta_4 CFC_{STRICT_{p,t}} + \beta_5 (CFC_{STRICT_{p,t}} CIT_{j,t}) \right.$

2 $\left\{ \begin{array}{l} + \beta_6 SH_{D_{j,t}} + \beta_7 (SH_{D_{j,t}} CIT_{j,t}) + \beta_8 SH_{TIGHTtot_{j,t}} + \beta_9 (SH_{TIGHTtoT_{j,t}} CIT_{j,t}) \\ + \beta_{10} SH_{TIGHTrel_{j,t}} + \beta_{11} (SH_{TIGHTrel_{j,t}} CIT_{j,t}) \end{array} \right.$

3 $\left\{ + \beta_{12} ES_{D_{j,t}} + \beta_{13} (ES_{D_{j,t}} CIT_{j,t}) + \beta_{14} ES_{TIGHT_{j,t}} + \beta_{15} (ES_{TIGHT_{j,t}} CIT_{j,t}) \right.$

4 $\left\{ + \beta_{16} MNC_{D_{i,t}} + \beta_{17} (MNC_{D_{i,t}} CIT_{j,t}) + \gamma X_{i,j,t} + \delta_t + \sigma_I + a_p + \varepsilon_{i,j,p,t.} \right.$

$TDAR_{i,j,p,t}$ is the total debt-to-asset ratio of an affiliate i located in a country j with a parent located in a country p in a year t. $CIT_{j,t}$ is the statutory corporate income tax rate in a country j in a year t. The motivation behind choosing $TDAR_{i,j,p,t}$ as our dependent variable is provided in section 3.1.1.

1. Explanatory variables representing CFC rules. $CFC_{D_{p,t}}$ is a dummy variable with value of 1 if the country of an affiliate's parent p had CFC rules in a year t, and 0 if not. $CFC_{D_{p,t}} CIT_{j,t}$ is an interaction term between $CFC_{D_{p,t}}$ and $CIT_{j,t}$. $CFC_{STRICT_{p,t}}$ is the indicator of strictness of CFC rules in the parent country p in a year

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[5] Construction of the dataset is described in detail in section 4.

t: $CFC_{STRICT\,p,t} = \frac{CIT_{pt}^{CFC}}{CIT_{pt}}$, where CIT_{pt}^{CFC} is the low tax CIT rate threshold set in CFC regime in a country p in a year t if the country p had CFC rules in the respective year, and CIT_{pt}^{CFC} is equal to 0 otherwise. As CIT_{pt}^{CFC} never exceeds CIT_{pt}, the indicator $CFC_{STRICT\,p,t}$ can take values from 0 to 1 only. For example, if a parent country's CIT rate is 20% and its CFC regime states that CFC rules will be applied if the tax rate in the home country of an affiliate is less than 12%, then $CFC_{STRICT} = \frac{12\%}{20\%} = 0.6$.

2. Explanatory variables representing safe-harbour thin-capitalization rules. $SH_{D\,j,t}$ is a dummy variable with value 1 if the affiliate's country j had thin-capitalization rules in a year t and if the threshold of thin-capitalization rules was defined in terms of a safe-harbour debt-to-equity ratio, and 0 otherwise. The safe-harbour debt-to-equity ratio can refer to either total debt or related party debt. Therefore, we have distinguished between the two approaches. Following the approach by Buettner et al. (2012), $SH_{TIGHTtot\,j,t}$ is the indicator of tightness of thin-capitalization rules in the affiliate's country j in a year t: $SH_{TIGHTtot\,j,t} = \frac{1}{(1+\mu_{j,t}^{tot})}$, where $\mu_{j,t}^{tot}$ is the safe-harbour threshold of thin-capitalization rules in a country j in a year t that is expressed as total-debt-to-equity ratio. As $\mu_{j,t}^{tot}$ cannot be negative, the indicator $SH_{TIGHTtot\,j,t}$ can take values from 0 to 1 only. For example, if a country sets the save haven total debt-to-equity ratio equal to 3:1, then $SH_{TIGHTtot\,j,t} = \frac{1}{(1+3)} = 0.25$. $SH_{TIGHTrel\,j,t}$ is the indicator of tightness of thin-capitalization rules in the affiliate's country j in a year t: $SH_{TIGHTrel\,j,t} = \frac{1}{(1+\mu_{j,t}^{rel})}$, where $\mu_{j,t}^{rel}$ is the safe-harbour threshold of thin-capitalization rules in a country j in a year t that is expressed as related debt-to-equity ratio. As $\mu_{j,t}^{rel}$ cannot be negative, the indicator $SH_{TIGHTrel\,j,t}$ can take values from 0 to 1 only. For example, if a country sets the safe haven related-debt-to-equity ratio equal to 2:1, then $SH_{TIGHTrel\,j,t} = \frac{1}{(1+2)} = 0.33$.

3. Explanatory variables representing earnings stripping thin-capitalization rules. $ES_{D\,j,t}$ is a dummy variable with value 1 if the affiliate's country j had thin-capitalization rules in a year t and if the threshold of thin-capitalization rules was defined as the maximum amount of interest that can be deducted relative to EBITDA, and 0 otherwise. $ES_{TIGHT\,j,t}$ is the indicator of tightness of thin-capitalization

rules in the affiliate's country j in a year t: $ES_{TIGHT\,j,t} = (1 - \omega_{j,t})$, where $\omega_{j,t}$ is the threshold of thin-capitalization rules in a country j in a year t that is expressed as a maximum share of EBITDA that can be deducted as an interest expense. As $\omega_{j,t}$ cannot be negative, the indicator $ES_{TIGHT\,j,t}$ can take values from 0 to 1 only. For example, if a country sets the maximum share of EBITDA that can be deducted equal to 20%, then $ES_{TIGHT\,j,t} = (1 - 0.20) = 0.80$.

For all policy indicators ($CFC_{STRICT\,p,t}$, $SH_{TIGHTtot\,j,t}$, $SH_{TIGHTrel\,j,t}$, and $ES_{TIGHT\,j,t}$) value of 1 represents the maximum strictness of the anti-tax-avoidance policy measure, and value of 0 implies that there is no policy measure in place.

4. Additional variables. $MNC_{D\,i,t}$ is a dummy variable with value of 1 if an affiliate i was part of an MNC in a year t, and 0 if it was a purely domestic company. In our data set, domestic companies are represented by companies whose all affiliates are located in the same country as the parent company. We include domestic companies as a control group in our regression model, as it improves variation in our dataset with respect to CFC rules. $MNC_{D\,i,t}CIT_{j,t}$ is an interaction term between $MNC_{D\,i,t}$ and $CIT_{j,t}$. Inclusion of MNC dummy variable and interaction term with CIT rate allows us to see whether MNCs have higher leverage than domestic companies and whether this effect is sensitive to the level of the CIT rate of an affiliate's country of residence.

$\gamma X_{i,j,t}$ is a vector of firm-level and country-level control variables, which have been included with an intention to reduce potential omitted variable bias.

δ_t is a vector of time dummies. σ_I and a_p are industry and parent fixed effects, respectively. By including parent fixed effects and industry fixed effects in all regressions, we control for common factors across MNCs and industries that affect an affiliate's capital structure decisions. In particular, fixed effects control for unobserved heterogeneity in capital structure of the companies and remove the effect of time-invariant variables. For example, capital intensity and profitability of an industry are industry-related determinants of capital structure. Furthermore, year dummies are included in all regressions in order to control for the overall tendencies and common macroeconomic shocks in the economy. $\varepsilon_{i,j,p,t.}$ is an error term.

3.1.1. Dependent variable

Our dependent variable ($TDAR_{i,j,p,t}$) is the total debt-to-asset ratio of an affiliate, where the total debt is the sum of current and non-current liabilities. It implies that in our thesis the total debt-to-asset ratio serves as a link between anti-tax-avoidance policy measures and profit shifting activities of MNCs, thereby allowing us to answer our research question. Our choice of the dependent variable is driven by, first, its theoretical and empirical relevance, and, second, availability of data.

Capital structure is one of the main profit shifting channels that can be used by MNCs to allocate profit to low-tax countries, as the overall tax liability of a group can be reduced by assigning high levels of debt to affiliates located in high-tax countries (Huizinga and Laeven, 2007). Also Møen, Schindler, Schjelderup, and Tropina (2011) examine how MNCs respond to tax differences across countries and show that it is optimal for MNCs to use both internal and external debt shifting along with the standard debt tax shield in order to minimize global tax liability. Furthermore, Buettner and Wamser (2013) explore profit shifting activities of MNCs; particularly, the role of internal debt as a commonly used vehicle in tax planning. To sum up, leverage decisions reflect profit shifting activities of MNCs. At the same time, leverage also reflects effectiveness of anti-tax-avoidance policy measures (Buettner et al., 2012).

Even though the previous studies that test effectiveness of CFC rules and other anti-tax-avoidance policy measures use various other dependent variables, for example, log of passive assets (Ruf and Weichenrieder, 2012; Ruf and Weichenrieder, 2013), fixed assets (Egger and Wamser, 2015) or internal debt (Buettner et al., 2012), the available data bases that cover European countries do not contain such detailed data.

As a result, we have chosen the total debt-to-asset ratio as our dependant variable, because it still allows us to gain reasonably informative insights of the effect of anti-tax-avoidance policy measures on profit shifting activities of MNCs and such data is available in Amadeus data base.

3.1.2. Independent variables

Statutory corporate tax rate

The first independent variable in our model is the statutory CIT rate of the country where a particular affiliate is located ($CIT_{j,t}$). Empirical studies and theory of corporate finance suggest that corporate taxation favors debt finance due to tax

deductibility of interest payments, see Graham (2006, pp. 576-603) for an overview. Our model prediction is that the statutory CIT rate variable should have a positive coefficient in the regression ($\beta_1 > 0$); thus, total leverage of an affiliate is expected to increase in line with an increase in the CIT rate.

CFC policy variables

In order to analyse effectiveness of CFC rules, which is the main focus of our thesis, we have included explanatory variables that reflect these rules in the regression: a dummy variable ($CFC_{D_{p,t}}$) and a strictness measure ($CFC_{STRICT_{p,t}}$)[6]. These variables create variation in our dataset, as several countries have introduced CFC rules or changed strictness of the rules over the time period considered. Furthermore, inclusion of the dummy in addition to the strictness measure allows for nonlinearity when moving from no CFC rules to having CFC rules. Inclusion of the two interaction terms ($CFC_{D_{p,t}}CIT_{j,t}$; $CFC_{STRICT_{p,t}}CIT_{j,t}$) allows us to estimate whether the effect of CFC rules on the total debt-to-asset ratio differs significantly for various CIT rates.

CFC rules make usage of internal debt costlier. From tax minimisation perspective, it is optimal for an MNC to locate the internal bank in a low-tax country, so that profit of the internal bank is subject to the minimum tax rate of the multinational group. As applicability of CFC rules means that profit that has been shifted to the internal bank is taxed at the parent country's tax rate, the MNC should relocate its internal bank to a country whose CIT rate is just above the low-tax applicability threshold specified in CFC rules to minimize its tax liability. The reduced maximum tax difference, which is the difference between an affiliate's tax rate and tax rate of the country where the internal bank is optimally located, limits the gain from profit shifting. This implies that the stricter CFC rules are, the less incentivised MNCs are to shift profit to the internal bank, and therefore, one can expect to observe a smaller total debt-to-asset ratio.

Our prediction is that the combined effect of CFC policy variables on the total debt-to-asset ratio is negative.

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[6] For the technical aspects of how the variables are constructed, refer to section 3.1.

Thin-capitalization policy variables

Thin-capitalization rules, defined as either safe-harbour or earnings stripping rules, affect leverage decisions of MNCs by limiting interest deductibility. We have modelled both variations of thin-capitalization rules using dummy variables ($SH_{D_{j,t}}$ and $ES_{D_{j,t}}$) and tightness measures ($SH_{TIGHTtot_{j,t}}$, $SH_{TIGHTrel_{j,t}}$, and $ES_{TIGHT_{j,t}}$)[7]. Similarly as for CFC rules, we have included interaction terms ($SH_{D_{j,t}}CIT_{j,t}$, $SH_{TIGHTtoT_{j,t}}CIT_{j,t}$, $SH_{TIGHTrel_{j,t}}CIT_{j,t}$, $ES_{D_{j,t}}CIT_{j,t}$, and $ES_{TIGHT_{j,t}}CIT_{j,t}$).

As discussed in section 2.2., CFC rules and thin-capitalization rules should be considered as complementary rather than substitute policies, and also in practice most of the developed countries include both measures in their anti-tax-avoidance legislations. Therefore, in order to limit omitted variable bias and obtain a more realistic view of effectiveness of CFC rules, we control for thin-capitalization rules.

Our prediction is that thin-capitalization rules are effective in reducing an affiliate's leverage.

3.1.3. Control variables

As suggested in the literature, a firm's leverage decisions are affected by several factors that reflect firm-level and country-level characteristics. Therefore, in order to reduce potential omitted variable bias, we have included a vector of control variables ($\gamma X_{i,j,t}$) that represents such characteristics in our regression. The specific variables have been chosen following the approach by Huizinga, Laeven, and Nicodème (2008) and Møen et al. (2011).

Firm-level control variables

Firm size

Empirical research suggests that firm size is correlated with leverage (Rajan and Zingales, 1995). Companies with high sales tend to have more stable cash flows and more diversified financing sources; therefore, large companies can access capital markets more easily and can attain more beneficial financing terms. Furthermore, firm size affects probability of bankruptcy, financial distress costs, and agency costs, which,

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[7] For the technical aspects of how the variables are constructed, refer to section 3.1.

in turn, are determinants of optimal leverage, according to the trade-off theory (Fama and French, 2002; Öztekin, 2015, pp. 310-311; Orihara, 2015, p. 9).

However, it should also be noted that large firms are claimed to have lower information asymmetry between the management of the firm and outside investors due to stronger monitoring efforts by various stakeholders. Pecking order theory states that equity financing is associated with relatively higher information asymmetries relative to debt; therefore, larger firms are better positioned to issue equity. This implies that large firms are more likely to have stronger preference towards equity financing than small firms (Rajan and Zingales, 1995; Fama and French, 2002).

Fixed asset ratio (tangibility)

Even though it has been established that the effect of tangibility on a firm's leverage is economically and statistically significant, empirical studies that examine whether this effect is positive or negative provide inconclusive evidence.

Tangible assets can serve as collateral, have higher liquidation value, and are more easily redeployable; therefore, a large fixed asset ratio lowers the risk for lenders and thereby potentially increases their willingness to provide loans. As a result, higher tangibility should potentially lead to lower borrowing costs and higher leverage (Titman and Wessels, 1988, p. 3; Rajan and Zingales, 1995, p. 1451; Lemmon, Roberts, and Zender, 2008, pp. 17-18). Another consideration might be that a high level of fixed assets creates higher depreciation expenses, which are tax deductible and thus create a non-debt tax shield. Interest deductions create tax savings only if they can offset taxable income. The higher the non-debt tax deductions, such as depreciation, the smaller the remaining taxable income to claim interest deductions against; therefore, the incentive to use debt finance decreases (DeAngelo and Masulis, 1980, p. 4).

Profitability

Academic research has developed arguments that support both a positive and a negative relationship between profitability and leverage.

According to the trade-off theory, the relationship between profitability and leverage should be positive. As earnings increase, agency costs of free cash flow are likely to increase, and debt can serve as a disciplinary tool that reduces the cash flow available for management spending (Jensen, 1986, p. 324). Furthermore, higher level of earnings implies that there is more pre-tax profit to shield from taxation. By

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increasing leverage and correspondingly creating debt tax shield, a company can achieve valuable tax savings. Expected bankruptcy costs decrease when profitability rises; therefore, the optimal level of leverage increases (Fama and French, 2002, pp. 6-9).

On the other hand, according to the pecking order theory, internal funding is less expensive than external funding; therefore, firms with higher profitability are expected to have lower leverage due to their ability to finance their investments through retained earnings rather than debt and to repay their existing liabilities (Fama and French, 2002; Orihara, 2015, p. 9). In addition, profit directly increases both book and market value of equity, which, in turn, lowers the debt-to-asset ratio, unless the firm takes some sort of offsetting action such as repurchases equity or issues new debt (Frank and Goyal, 2012, pp. 3-4; Öztekin, 2015, p. 3).

Loss carry-forward

As loss carry-forwards act as a non-debt tax shield, necessity to use the debt tax shield decreases. Firms with loss carry-forwards are likely to face a zero tax rate again; therefore, such firms are unlikely to save taxes by using interest deductions in the upcoming years and are unlikely to issue new debt due to already existing non-debt tax shield. Therefore, loss carry-forwards are expected to have a negative impact on leverage (MacKie-Mason, 1990, p. 1472; Orihara, 2015, p. 4).

However, loss carry-forwards indicate that a firm is in financial difficulties. The equity capital is likely to deteriorate, which, in turn, would lead to an increase in the debt-to-equity ratio. The firm might also issue more debt in order to finance its business activities.

Country-level control variables

Inflation

Inflation is an economic indicator that reflects stability of a country. An increase in inflation implies uncertainty in the business environment, which, in turn, affects a firm's ability to repay its liabilities. If inflation leads to an increase in risk premium to be paid to creditors, attractiveness of debt decreases due to increased costs of debt, and the relationship between inflation and leverage becomes negative (Blouin et al., 2014, p. 11; Huizinga et al., 2008, pp. 92-93; Ayaydın and Baltaci, 2014, pp. 50-51). An inflationary environment also implies uncertainty about the ex post real interest rate

that will be paid on the nominal debt (Huizinga et al., 2008, p. 93). In addition, if debt is denominated in home currency, currency weakening may create an additional incentive for a firm to repay its liabilities (Taggart, 1985, p. 37; Ayaydın and Baltaci, 2014, pp. 50-51).

However, higher nominal interest rates, boosted by inflation, increase value of the debt tax shield. This predicts a positive relationship between inflation and leverage (Huizinga et al., 2008, pp. 92-93; Ayaydın and Baltaci, 2014, pp. 50-51; Blouin et al., 2014, p. 11). Furthermore, if the expected inflation is considered, then anticipation of high inflation makes current debt issuances appear cheaper (Öztekin, 2015, p. 304).

Corruption

It is common in the literature to use corruption as a variable that characterizes national institutions and captures perceptions of the quality of public governance. Corruption weakens a company's trust in the political system, economic institutions and enforceability of the law, and thereby corruption influences the company's operational and strategic decision-making (Fan, Titman, and Twite, 2012, p. 26). For instance, a decline in corruption is associated with a decrease in cost of debt and cost of equity, and this sensitivity is particularly evident in countries that have a relatively low level of corruption (Baxamusa and Jalal, 2014, pp. 332-333). Öztekin and Flannery (2012) note that companies move towards the optimal capital structure at lower adjustment costs and at a higher speed when the institutional environment, with corruption being one of the variables that describe it, is strong.

Fan et al. (2012, p. 47) find that companies that operate in a relatively corrupt environment, where legal protection for financial claimants is weak, tend to rely more heavily on debt financing, rather than equity financing. Debt investors are better positioned to be able to enforce and monitor fulfilment of contracts, whereas equity investors are residual claimants and can be poorly protected against expropriation by self-interested managers or bureaucrats. Furthermore, bureaucrats seeking private gains might prefer to channel funds into companies via debt market and the banks that they control, instead of equity market that such bureaucrats typically find harder to influence (Fan, Rui, and Zhao, 2008, p. 344).

Growth opportunities

Research suggests that growth opportunities, which often are proxied by market-to-book ratio, growth rate of sales, or growth rate of assets, are one of the factors that determine a company's capital structure.

As argued by Hovakimian, Opler, and Titman (2001, p. 2), growth opportunities should be financed by using relatively more equity, as opposed to assets in place that should be financed by using relatively more debt. For example, high-growth companies in the technology sector tend to protect their growth opportunities by avoiding issuance of debt. Often these companies can reach their economic potential by pursuing risky investment opportunities; however, the highly uncertain initial cash-flows compromise the companies' ability to serve their debt obligations. As a result, if high-growth companies do rely on debt financing, they are likely to face strong risk-avoidance incentives (Brito and John, 2001, p. 2; Mukherjee and Mahakud, 2010, p. 183). Furthermore, Titman and Wessels (1988, p. 4) recognize that, despite being value-adding to a company, growth opportunities cannot be used as a collateral that increases a company's borrowing capacity. Therefore, if an increase in a company's value is driven by strengthening of perceived growth opportunities, the company may issue equity, rather than debt, and this implies a negative relationship between growth opportunities and leverage (Hovakimian et al., 2001, p. 2). Such negative relationship is indeed observed by Lang, Ofek, and Stulz (1995, p. 32), and the authors note that the results are robust for various measures of growth opportunities.

Yet there are also studies that observe the opposite: higher growth opportunities are associated with higher leverage. For example, Huizinga et al. (2008, pp. 10-11) argue that growth opportunities indicate a company's future profitability and thereby also its ability to attract debt financing and to eventually meet debt obligations. In addition, high-growth industries and countries may encourage lending institutions to provide more funds to companies operating in these environments. Awan, Bhatti, Ali, and Qureshi (2010, p. 96) further suggest that if companies perceive growth opportunities and the associated investment policy to be highly risky, they might prefer to pass this risk on to creditors and issue equity at more attractive prices only after the investments have been made and uncertainty of future growth has declined.

Creditor rights

Various studies find that creditor rights affect corporate decision making and are a country-level determinant of a company's capital structure. However, there are two distinct and conflicting views on whether stronger creditor rights should be associated with higher or lower leverage.

The supply side view takes the perspective of debt investors. Strengthening of creditor rights makes it easier and less costly for lenders to enforce debt contracts and repayment, reclaim collateral, and gain control of a firm in the case of financial distress. As a result, the supply side view states that strong creditor protection reduces contracting costs and allows lenders to offer debt financing at more favourable terms, which encourages companies to adopt high leverage (Cho, Ghoul, Guedhami, and Suh, 2014; Öztekin, 2015, p. 305). This positive relationship between creditor rights and total leverage is also expected by Blouin et al. (2014, p. 11); however, the authors note that as external debt becomes more available and the borrowing terms and conditions improve, the need for internal debt might decline. Therefore, stronger creditor rights can be associated with higher total leverage, but lower internal leverage.

The demand side view, on the other hand, claims that strong creditor protection increases the penalty that managers face in the case of financial distress. The managers are more likely to lose their position, and this, in turn, suggests that self-interested managers that do not want to risk being removed from the company might be averse to taking on debt (Rajan and Zingales, 1995, p. 1444; Cho et al., 2014). Strong creditor protection can also create incentives for the management to attempt to reduce cash-flow uncertainty by avoiding high-risk investment projects and, similarly as argued before, by limiting usage of debt financing (Acharya, Amihud, and Litov, 2011). Therefore, the demand side view explains why the relationship between creditor rights and leverage can be negative. The empirical analysis by Rajan and Zingales (1995, p. 1444) and Cho et al. (2014) supports this view.

3.2. Endogeneity issues

In order to examine unbiasedness of the obtained results, endogeneity issues should be considered. In econometrics, an endogenous explanatory variable is one which is correlated with the error term. In other words, the error term captures the effect of a variable that is related to both the dependent and explanatory variables and the OLS assumption of exogeneity is violated (Wooldridge, 2002, p. 50). In this section, we consider two sources of endogeneity – omitted variables and simultaneity – that potentially might affect our model and the obtained regression results.

Omitted variable bias occurs when one or more important factors are not controlled for in the model, and, as a result, the estimates of the effects of the included explanatory variables are either over- or underestimated. In the context of our research, omitted variable bias might arise due to relatedness of various anti-tax-avoidance policies and tactics that all intend to limit profit shifting and thereby also affect leverage decisions of companies. Given the complexity of modelling and quantifying such measures and their effects, it is not feasible to control for all of them in our model. As the focus of our thesis is CFC rules, we attempt to mitigate omitted variable bias by modelling also thin-capitalization rules, which, as discussed in section 2.2., affect capital structure decisions of firms and can work as a complementary policy to CFC rules. Transfer pricing rules are another commonly implemented anti-tax-avoidance measure; however, the link between these rules and corporate leverage is less straight-forward and we do not control for transfer pricing rules in our main regression model. Nevertheless, in section 6.1., we extend our analysis by including transfer pricing rules as an explanatory variable.

Another concern might be that strictness and tightness variables that we use to model CFC rules and thin-capitalization rules are imperfect proxies for their actual stringency and applicability. For example, in our model two countries can be assigned the same strictness score of CFC rules even if the underlying CFC policies are only remotely similar. In particular, it is not viable to create a comprehensive variable that encompasses all aspects of various CFC regimes, such as definition of control, countries exempted from the rules, income subject to the rules and other. With this in mind, a simplified, even if somewhat limited, proxy of strictness of CFC rules allows us to quantify and code multiple heterogeneous CFC regimes, which is crucial given that our focus is to conduct an empirical study on CFC rules across Europe.

Simultaneity arises when at least one of the explanatory variables and the dependent variable influence each other simultaneously (Wooldridge, 2002, p. 51). In our model, it would mean that companies' capital structure and governments' anti-tax-avoidance policy measures or corporate tax rates are determined at the same time. Huizinga et al. (2008) run the instrumental variables regression and find evidence that corporate tax rates are not endogenous with respect to companies' capital structure. However, to the best of our knowledge, the literature so far has not raised substantial concerns that causality between anti-tax-avoidance policy measures and companies' capital structure might be reversed.

4. Data and descriptive statistics

The aim of our thesis is to examine the effects of anti-tax-avoidance measures on MNCs. We pursue this research objective by conducting a quantitative study using detailed affiliate-level financial and historical ownership panel data. Historical ownership data is crucial when analysing the response of a multinational group to the introduction of or changes in the CFC regime of the home country of the parent company.

There is no publicly available data base which contains both financial and ownership data and covers a broad set of countries over an extended period of time. Therefore, our study is based on a merged data set, where affiliate-level financial data is retrieved from Amadeus data base and historical ownership data is obtained from Orbis data base. Both of these data bases are provided by Bureau van Dijk. Amadeus data base contains comparable financial data and business information on Europe's public and private companies. The data base covers 43 countries and provides standardised annual accounts on a consolidated and unconsolidated basis. Orbis is a global data base and, apart from other financial and business data, also includes information on historical and current company ownership structures.

Our constructed data set contains data on European affiliates that are owned by parent companies located in Europe, the US, and Canada from 2004 to 2015. First, we use Orbis to identify majority-owned European affiliates and determine their respective parent companies over our sample period. In our research, we consider an affiliate to be majority-owned if at least 50% of its shares is directly or indirectly owned by a single parent company. We assume that the parent can fully exert control over an affiliate for profit shifting and tax planning purposes if the affiliate is majority-owned. Second, the compiled list of unique BvD identification numbers[8] from Orbis is further used to extract financial data from Amadeus. As a result, our merged data set overcomes the issue of not having historical ownership records readily available in Amadeus. For the years from 2004 to 2013 the merged data set covering European affiliates owned by European parents is provided by Aija Poļakova (2015). We extend her raw data by updating it for years 2014 and 2015 and by adding European affiliates owned by parent companies located in the US and Canada over the full sample period. The combined

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[8] BvD identification number (BvD ID) is a unique company identification number that can be used in data query forms in the Bureau Van Dijk data bases.

data set is then imported in STATA and, as described in the next section, we perform various data trimming procedures.

4.1. Data trimming

After retrieving financial data from Amadeus for the companies identified using Orbis, our raw data consisted of 12 721 213 affiliate-year observations. In order to be able to use this data for our research, we performed several data trimming procedures, which are summarized in table 4. First, we dropped affiliate-year observations that appeared in the data more than once for the same parent and for the same year. Second, we removed affiliate-year observations that contained extreme values of debt-to-asset ratio (negative or exceeding the value of one). Third, we deleted affiliate-year observations that were reported as consolidated accounts. Fourth, we excluded affiliate-year observations with missing values of firm-level or country-level control variables. Finally, we removed affiliate-year observations of small domestic companies. In order to improve comparability between domestic companies and MNCs, for each year we dropped domestic companies that had sales below sample mean. As a result, our final data set consists of 1 260 815 affiliate-year observations out of which 702 289 observations represent MNCs and the remaining 558 526 observations represent domestic companies.

Table 4. Data trimming procedures

	Number of observations	Percentage
(1) All affiliate-year observations of European affiliates that are owned by parent companies located in Europe, the US, and Canada (2004-2015)	12 721 213	100%
(2) Removed affiliate-year observations occurring more than once per same parent	11 495 867	90%
(3) Removed affiliate-year observations with extreme total debt-to-asset ratios	9 072 099	71%
(4) Removed affiliate-year observations with consolidated accounts	8 161 483	64%
(5) Removed affiliate-year observations with missing firm-level or country-level control variables	3 417 617	27%
(6) Removed domestic companies with sales below mean value	1 260 815	10%
Final data set	**1 260 815**	
- MNCs	702 289	56%
- Domestic companies	558 526	44%

4.2. Variable sources

In this section, we provide a detailed description of the variables included in our model. A summary is available in Appendix B.

4.2.1. Dependent variable

Our dependent variable ($TDAR_{i,j,p,t}$) is expressed as the total debt-to-asset ratio of an affiliate, and the variable takes values from zero to one. Total debt is calculated as the sum of current and non-current liabilities and accounts for liabilities to related parties as well. This data is retrieved from Amadeus data base.

4.2.2. Independent variables

Statutory corporate tax rate

Data on statutory tax rates across countries and years is obtained from the European Tax Handbook series by IBFD (1991-2015), OECD (2014), and Deloitte (2015a). For countries that have both central and sub-central statutory corporate income tax rates, such as Belgium, Germany, Luxembourg, Portugal, Switzerland, the US, and Canada, we report the combined CIT rate. Table containing CIT rates that are used in our analysis is presented in Appendix C.

Anti-tax-avoidance policy variables

We use the European Tax Handbook series by IBFD (1991-2015) to summarize development of CFC rules and thin-capitalization rules. We use this source of information, first, to prepare an overview of development of CFC rules (see section 1.1.3.) and, second, to construct dummy variables for CFC rules and thin-capitalization rules ($CFC_{D\,p,t}$, $SH_{D\,j,t}$, $ES_{D\,j,t}$) and strictness ($CFC_{STRICT\,p,t}$) and tightness ($SH_{TIGHTtot\,j,t}$, $SH_{TIGHTrel\,j,t}$, $ES_{TIGHT\,j,t}$) variables. Detailed coding for CFC rules and thin-capitalization rules is displayed in Appendix D and Appendix E, respectively.

Firm-level control variables

The data necessary for constructing firm size, tangibility, profitability, and loss carry-forward control variables is obtained from Amadeus data base.

Firm size of an affiliate *i* is computed as the logarithm of sales. Tangibility ratio of an affiliate *i* is defined as the ratio of fixed assets to total assets. Profitability variable is computed as a ratio of an affiliate's earnings before interest, tax, depreciation, and

amortization (EBITDA) to total assets. Loss carry-forward variable is defined as a dummy variable equal to 1 if an affiliate has carry-forward losses, and 0 otherwise.

Country-level control variables

Inflation control variable is defined as the annual percentage change in the consumer price index. Our primary source for inflation data is the World Development Indicators catalogue by the World Bank (2016a).

Corruption variable is defined as the logarithm of annual corruption index of a particular country. The data on the corruption index is obtained from the Worldwide Governance Indicators data base by the World Bank (2016b). In this data base, countries are assigned a corruption index from -2.5 to 2.5, where -2.5 indicates a very high corruption level. However, for our research purposes, we transform the index to take values within the interval from 0 to 10. Similarly as in the original data, the lowest score, 0, indicates a very high corruption level.

For constructing growth opportunities variable, we follow Huizinga et al. (2008, p. 100) and Møen et al. (2011, p. 18). We start with calculating the annual sales growth for each affiliate. We then estimate median annual sales growth per industry for each country and assign this estimate across the respective affiliates as a proxy for growth opportunities.

Creditor rights variable is defined as the logarithm of annual strength of legal rights index of a particular country. The data on the legal rights index is obtained from the World Development Indicators data base by the World Bank (2016c). Legal rights index measures the strength of creditors' legal protection, as implied by the collateral and bankruptcy laws. The index ranges from 0 to 12, where 12 indicates the strongest creditor rights. For our research purposes, we transform the index to take values within the interval from 0 to 10, where a higher score indicates stronger creditor protection.

4.3. Descriptive statistics

In this section, we analyse our data set and present key descriptive statistics that are relevant for our study.

Our final data set covers the time period from 2004 to 2015 and includes majority-owned (>50%) companies that are located in Europe and are owned by parent companies located in Europe, the US, or Canada. The data set contains 1 260 815 affiliate-year observations, where MNCs account for 702 289 (56%) observations and domestic companies account for 558 526 (44%) observations.

Table 5 displays the split of affiliate-year observations, as in the final data set, according to a company's country of residence and its parent's country of residence[9]. For example, 62 affiliate-year observations represent affiliates located in Denmark that are owned by parent companies located in Germany. The highlighted cells represent the number of affiliate-year observations of affiliates that are part of an MNC, but are located in the same country as the parent company.

As it can be seen from this table, in our data set Italy (18%), France (15%) and Spain (9%) are three most represented countries of location for affiliates and domestic companies (accounting for 18%, 15%, and 9% of the total number of observations, respectively). Most affiliates are owned by parent companies located in France, Italy, and Germany (accounting for 17%, 13%, and 10%, respectively). Despite their relatively small size, the Benelux countries are a noteworthy location for parent companies (representing 15%) and for affiliates (representing 8%). This might be explained by the countries' developed infrastructure, qualified workforce, financial services, and attractive local tax regimes (Bruinhorst and Lohest, 2012).

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[9] There are 49 different parent countries represented in our data set; however, in order to improve readability, only 10 largest countries in terms of assigned affiliate-year observations are displayed in the columns of this table.

Table 5. Affiliate-year observations by country of residence

The table displays affiliate-year observations according to a company's country of residence (rows) and its parent's country of residence (columns). Columns 2-13 refer to affiliate-year observations that are part of MNC. Column 14 presents affiliate-year observations of domestic companies, and this data is retrieved from the final data set separately. The shaded cells represent affiliate-year observations that are part of MNC (therefore, not a purely domestic company as defined in our thesis), but are located in the same country as the parent.

Affiliate location	Austria	Belgium	France	Germany	Italy	Nether-lands	Spain	Sweden	United Kingdom	United States	Other	Sum of MNC affiliates	2. Domestic companies	Total	%
Austria	8 171	182	565	3 015	281	694	118	270	461	419	1 241	15 417	6 621	22 038	1.7 %
Belgium	183	34 170	7 197	2 622	1 153	4 885	506	1 049	1 854	1 475	3 071	58 165	23 289	81 454	6.5 %
Bosnia and Herzegovina	109	7	12	135	123	48	16	44	13	30	1 269	1 806	1 292	3 098	0.2 %
Bulgaria	390	273	289	522	334	293	132	117	155	128	2 251	4 884	27 188	32 072	2.5 %
Croatia	965	157	323	683	454	232	47	157	119	115	3 881	7 133	3 995	11 128	0.9 %
Czech Republic	2 717	945	1 777	5 040	860	2 245	523	770	1 135	745	7 708	24 465	12 471	36 936	2.9 %
Denmark	9	8	42	62	6	80	7	82	46	187	533	1 062	568	1 630	0.1 %
France	570	9 658	77 740	7 059	7 285	4 174	2 706	1 851	4 408	3 347	6 739	125 537	65 062	190 599	15.1 %
Germany	1 570	1 274	3 011	20 021	1 653	3 081	547	1 072	2 273	2 439	4 793	41 734	20 892	62 626	5.0 %
Greece	59	200	788	591	646	671	286	87	362	177	2 570	6 437	5 356	11 793	0.9 %
Hungary	598	580	734	1 581	763	382	159	394	260	101	2 437	7 989	879	8 868	0.7 %
Iceland	0	0	8	8	4	7	2	1	3	10	173	216	1 156	1 372	0.1 %
Ireland	0	14	41	47	25	199	49	6	311	791	629	2 112	426	2 538	0.2 %
Italy	1 264	2 084	6 953	6 123	61 105	4 271	2 585	1 043	4 623	2 542	11 133	103 726	121 803	225 529	17.9 %
Luxembourg	18	628	355	333	136	112	4	33	261	142	1 605	3 627	812	4 439	0.4 %
Netherlands	38	231	438	472	171	2 239	99	124	450	457	443	5 162	1 967	7 129	0.6 %
Norway	93	235	627	755	216	912	84	5 053	758	893	11 756	21 382	58 615	79 997	6.3 %
Poland	1 054	1 397	2 467	5 366	2 057	2 494	693	1 680	1 134	850	5 526	24 718	8 470	33 188	2.6 %
Portugal	79	541	2 261	1 192	1 084	1 089	5 905	314	703	605	8 697	22 470	18 213	40 683	3.2 %
Romania	2 031	1 354	2 788	3 891	6 680	2 427	962	367	1 016	642	8 483	30 641	37 389	68 030	5.4 %
Serbia	640	103	235	403	383	362	77	98	114	149	2 972	5 536	3 207	8 743	0.7 %
Slovak Republic	1 292	724	863	1 526	1 083	597	203	249	301	298	5 885	13 021	6 529	19 550	1.6 %
Slovenia	675	78	218	563	576	156	21	105	88	95	2 874	5 449	4 977	10 426	0.8 %
Spain	397	1 678	7 274	5 584	5 471	4 098	38 594	834	2 994	1 667	5 027	73 618	45 561	119 179	9.5 %
Sweden	157	715	1 457	1 433	673	857	188	32 231	993	1 231	7 489	47 424	50 854	98 278	7.8 %
Ukraine	135	51	150	244	59	202	38	68	113	16	603	1 679	4 748	6 427	0.5 %
United Kingdom	103	200	831	1 148	462	1 617	216	313	6 212	6 918	2 606	20 626	9 045	29 671	2.4 %
Other	9	11	7	94	11	11	5	33	5	0	372	558	790	1 348	0.1 %
Total	23 489	57 718	120 090	71 593	94 048	39 146	54 838	53 544	31 730	26 980	129 113	702 289	558 526	1 260 815	100 %
%	3 %	8 %	17 %	10 %	13 %	6 %	8 %	8 %	5 %	4 %	18 %	100 %			

Table 6 displays the various combinations anti-tax-avoidance policy measures that European countries have implemented, as of 2015. Our analysis is limited to CFC rules and thin-capitalization rules (represented by safe-harbour rules and earnings stripping rules). For example, 17 European countries from our data set had implemented CFC rules, out of which three had CFC rules only, six had CFC rules in combination with safe-harbour rules, six had CFC rules in combination with earnings stripping rules, and two had implemented all three sets of rules. The largest number of European countries had implemented thin-capitalization rules only (16 countries), followed by 14 countries that had implemented both CFC rules and thin-capitalization rules.

Table 6. Combinations of anti-tax-avoidance policies in European countries

This table summarizes the various combinations of anti-tax-avoidance policies implemented by European countries, as of 2015. We focus on CFC rules (CFC) and thin-capitalization rules (represented by earnings stripping (ES) and safe-harbour (SH) rules) only. Information is compiled from table 1 and table 3. Although Austria, Estonia, and Latvia have introduced some CFC provisions, in this table the countries are not classified as having CFC rules.

Combination	Countries		%
CFC only	Iceland, Norway, Sweden	3	6 %
CFC+SH	Hungary, Lithuania, Poland, Russia, Turkey, United Kingdom[10]	6	13 %
CFC+ES	Finland, Germany, Greece, Italy, Portugal, Spain	6	13 %
CFC+SH+ES	Denmark, France	2	4 %
SH only	Albania, Belarus, Belgium, Croatia, Czech Republic, Latvia, Luxembourg, Macedonia, Monaco, Netherlands, Romania, Serbia, Slovenia, Switzerland	14	30 %
SH+ES	Bulgaria	1	2 %
ES only	Slovak Republic	1	2 %
None	Andorra, Austria, Bosnia and Herzegovina, Cyprus, Estonia, Gibraltar, Ireland, Kosovo, Liechtenstein, Malta, Moldova, Montenegro, San Marino, Ukraine	14	30 %
Total		47	100%

In contrast, table 7 summarizes the various combinations of anti-tax-avoidance policy measures from an affiliates' perspective. Whether an affiliate is covered by CFC rules is determined by its parent's country of residence, and whether it is covered by thin-capitalization rules is determined by the affiliate's country of residence. We distinguish between domestic companies and affiliates of MNCs. As it can be seen from the table, CFC rules apply to 40% of our affiliate-year observations, where 12% of affiliate-year observations are covered by CFC rules only, 11% - by CFC rules in

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[10] When determing whether the UK should be classified as having safe-harbour rules, we follow the approach by Buettner et al. (2012). The authors argue that although the UK incorporated its thin-capitalization rules into transfer pricing rules in 2004, it still uses the safe haven debt-to-equity ratio as a guideline when applying the arm's length principle.

combination with safe-harbour rules, 10% - by CFC rules in combination with earnings stripping rules and 7% - by CFC rules in combination with both safe-harbour and earnings stripping rules.

Table 7. Affiliate-year observations as affected by different combinations of anti-tax-avoidance policies

The table shows how many affiliate-year observations from our final data set are affected by various combinations of anti-tax-avoidance policies. For example, 92 603 affiliate-year observations are covered by all three policy measures (their parent country has CFC rules (CFC) and their home country has both safe-harbour (SH) and earnings stripping (ES) rules). CFC rules in total affect 515 271 affiliate-year observations from our data set. See also illustration 1.

Combination	Domestic	%	MNC	%	Total	%
CFC only	0	0%	156 293	22%	156 293	12%
CFC+SH	0	0%	138 146	20%	138 146	11%
CFC+ES	0	0%	127 167	18%	127 167	10%
CFC+SH+ES	0	0%	93 665	13%	93 665	7%
SH only	124 012	22%	102 572	15%	226 584	18%
SH+ES	88 181	16%	20 784	3%	108 965	9%
ES only	170 804	31%	27 002	4%	197 806	16%
None	175 527	31%	36 662	5%	212 189	17%
Total	558 524	100%	702 291	100%	1 260 815	100%

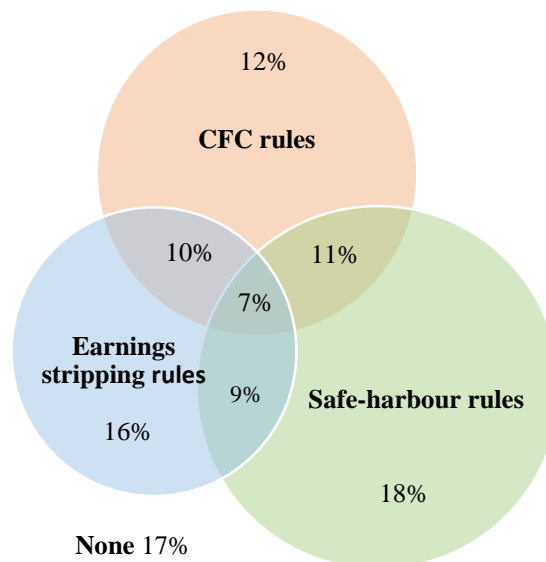**Illustration 1. Visualization of affiliate-year observations as affected by different combinations of anti-tax-avoidance policies** (see table 7).

As discussed in section 3.1.3., we include firm-level and country-level control variables in all regressions. Appendix F presents mean values and standard errors of these control variables. A summary of the average total debt-to-asset ratios across countries is available in Appendix G.

5. Empirical results

In this section, we present and discuss the obtained regression results. We start our regression analysis by focusing on the effect of CFC rules on leverage. Next, as this limited focus is likely to result in omitted variable bias, we extend our regression approach by controlling for thin-capitalization rules and altering the functional form of the regression.

Given the complexity of the model and the large number of explanatory variables included in the regressions, it is challenging to meaningfully interpret the magnitude of the effect of CFC rules and thin-capitalization rules on leverage. Therefore, we analyse the relationships between the dependent variable and explanatory variables primarily by assessing the signs and significance levels of the estimated coefficients.

5.1. Presenting the main results

The results of the regressions that examine the effect of CFC rules on leverage are presented in table 8. Regression (1) includes an affiliate's CIT rate as an explanatory variable. In order to observe whether MNCs have higher leverage relative to domestic companies, we include an MNC dummy and an interaction term between the MNC dummy and an affiliate's CIT rate. In regressions (2), (3), and (4), we add CFC policy variables step by step. Inclusion of the dummy in addition to the strictness measure allows for nonlinearity in the relationship between leverage and strictness of CFC rules.

The estimated coefficients on the firm-level and country-level control variables remain statistically significant and do not vary substantially throughout further tests (regression 1 to 15). Therefore, in order to improve readability of the tables, we present them in table 8 only. However, it should be emphasised that the control variables are included in all regressions. An analysis of the estimated coefficients on the control variables is provided in section 5.2.

Table 8. The effect of CFC policy on total debt-to-asset ratio

The dependent variable is an affiliate's total debt-to-asset ratio (TDAR). CFC refers to controlled-foreign-company rules. Variable definitions are summarized in Appendix B. The data set covers years from 2004 to 2015 and consists of European majority-owned affiliates, owned by parents located in Europe, the US, and Canada, and domestic companies. The regressions are estimated by ordinary least squares. Parent, industry, and year fixed effects are included. Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)
Affiliate's CIT	0.174***	0.168***	0.168***	0.149***
	(0.017)	(0.017)	(0.017)	(0.017)
MNC dummy	-0.016***	-0.014**	-0.014**	0.001
	(0.005)	(0.005)	(0.005)	(0.006)
MNC*CIT	0.072***	0.079***	0.079***	0.020
	(0.017)	(0.018)	(0.018)	(0.021)
CFC dummy		-0.006*	-0.006	0.049***
		(0.003)	(0.007)	(0.014)
CFC STRICT			-0.001	-0.126***
			(0.010)	(0.019)
CFC dummy*CIT				-0.193***
				(0.041)
CFC STRICT*CIT				0.452***
				(0.058)
Log of Sales	0.024***	0.024***	0.024***	0.024***
	(0.000)	(0.000)	(0.000)	(0.000)
Fixed asset ratio	-0.085***	-0.085***	-0.085***	-0.085***
	(0.005)	(0.005)	(0.005)	(0.005)
Profitability	-0.066***	-0.066***	-0.066***	-0.066***
	(0.007)	(0.007)	(0.007)	(0.007)
Loss carry-forward	0.084***	0.084***	0.084***	0.084***
	(0.001)	(0.001)	(0.001)	(0.001)
Inflation	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Log of Corruption index	-0.023***	-0.023***	-0.023***	-0.021***
	(0.003)	(0.003)	(0.003)	(0.003)
Growth opportunities	0.007***	0.007***	0.007***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)
Log of Creditor rights index	-0.039***	-0.039***	-0.039***	-0.039***
	(0.001)	(0.001)	(0.001)	(0.001)
R^2	0.0656	0.0655	0.0655	0.0661
Observations	1 260 815	1 260 815	1 260 815	1 260 815

The estimated coefficient on an affiliate's CIT rate is statistically significant and positive in all regressions. This implies that an increase in the CIT rate is associated with higher leverage, which is in line with the findings by Buettner et al. (2012, pp. 935-936) and Møen et al. (2011, p. 21). One of the main explanations might be that a higher CIT rate increases the value of debt tax shield and makes debt financing more attractive.

The positive coefficient on the MNC*CIT interaction term outweighs the negative coefficient on the MNC dummy when the tax rate is high. This means that in high-tax countries MNCs have higher leverage than domestic companies. However, the effect becomes statistically insignificant as we add explanatory CFC policy variables to regression (4). CFC rules affect only MNCs and thereby CFC policy variables partly capture the capital structure differences between MNCs and domestic companies.

In regression (2), we add a CFC dummy and the obtained coefficient is negative and statistically significant at 10% level. The negative coefficient implies that introduction of CFC rules in the country where an affiliate's parent is located is associated with a decrease in an affiliate's total debt-to-asset ratio. Strictness of CFC rules varies across countries, and CFC STRICT variable allows us to capture these differences. Even though the coefficient on the strictness of CFC rules variable is statistically insignificant in regression (3), when interaction terms with CIT rate are included, see regression (4), the coefficients on all explanatory variables related to CFC rules become statistically significant at 1% level.

When estimating how CFC rules, represented by the four explanatory variables, affect leverage, our approach is to illustrate the total effect of the rules graphically. In particular, we use a two-dimensional graph to express leverage as a function of the strictness of CFC rules variable. Graph 1 is based on the estimated coefficients from regression (4) and illustrates the policy effects for different CIT rates. Therefore, we assume that CFC dummy equals 1 and fix all control variables to their mean values (Appendix F). Finally, we compute the total debt-to-asset ratio for various CFC STRICT and CIT levels by using the estimated coefficients on CFC STRICT, CFC dummy*CIT, and CFC STRICT*CIT variables. It should be noted that, given the assumptions underlying the graph, the values on the y-axis should not be seen as actual predictions of the total debt-to-asset ratio. It is the slope of the function that is of interest for our analysis.
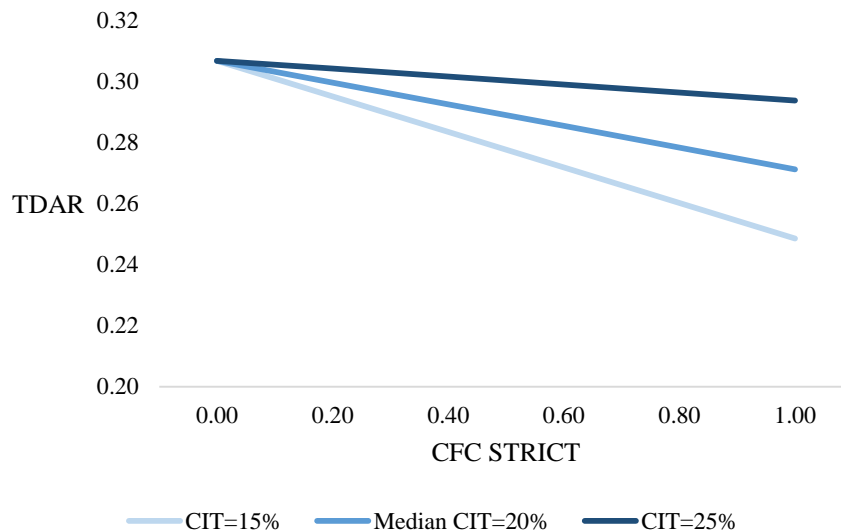
Graph 1. Regression 4: The effect of a parent country's CFC policy on an affiliate's total debt-to-asset ratio for various CIT rate levels. Median CIT rate refers to year 2015. In order to improve comparability of slopes, the functions have been adjusted to have a single starting point.

As it can be seen in graph 1, an increase in the strictness of CFC rules is associated with a decrease in an affiliate's total debt-to-asset ratio, and this finding holds for the three levels of CIT rate modelled. Furthermore, the graph suggests that the total debt-to-asset ratio is more responsive to changes in strictness of CFC rules for lower levels of CIT rate. The differences in slopes are driven by the positive coefficient on CFC STRICT*CIT interaction term.

One of the potential explanation of why CFC rules appear to be less effective in high-tax countries is that CFC rules are not perfectly binding and there is some leeway in the rules. When companies attempt to find and exploit loopholes in the rules, they face concealment costs, such as fees for tax consultations and even bribes. Since a high CIT rate implies that it is more attractive and valuable to preserve the volume of profit shifted, companies are more willing to incur concealment costs in order to reduce the taxable income base in the high-tax country (Ruf and Schindler, 2015, p. 21; Schindler and Schjelderup, 2016).

The results of the regressions that examine the effect of CFC rules on leverage and also control for thin-capitalization rules are presented in table 9.

Table 9. The effect of CFC policy on total debt-to-asset ratio, controlling for thin-capitalization rules

The dependent variable is an affiliate's total debt-to-asset ratio (TDAR). CFC refers to controlled-foreign-company rules, SH – to safe-harbour rules, ES – to earnings stripping rules. Variable definitions are summarized in Appendix B. The data set covers years from 2004 to 2015 and consists of European majority-owned affiliates, owned by parents located in Europe, the US, and Canada, and domestic companies. The regressions are estimated by ordinary least squares. Control variables – Log of Sales, Fixed asset ratio, Profitability, Loss carry-forward, Inflation, Log of Corruption index, Growth opportunities, Log of Creditor rights index – are included. Parent, industry, and year fixed effects are included. Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(5)	(6)	(7)
Affiliate's CIT	0.220***	0.212***	0.110***
	(0.018)	(0.018)	(0.022)
MNC dummy	0.003	0.004	0.012*
	(0.005)	(0.006)	(0.006)
MNC*CIT	0.019	0.011	-0.023
	(0.018)	(0.018)	(0.022)
CFC dummy	-0.005	0.004	0.028**
	(0.003)	(0.007)	(0.014)
CFC STRICT		-0.013	-0.082***
		(0.010)	(0.019)
CFC dummy*CIT			-0.109***
			(0.041)
CFC STRICT*CIT			0.297***
			(0.058)
SH dummy	-0.022***	-0.040***	-0.009
	(0.001)	(0.002)	(0.011)
SH TIGHT TOTAL		0.055***	0.095***
		(0.007)	(0.036)
SH TIGHT RELATED		0.058***	-0.343***
		(0.006)	(0.041)
SH dummy*CIT			-0.059
			(0.036)
SH TIGHT TOTAL*CIT			-0.424***
			(0.132)
SH TIGHT RELATED*CIT			1.092***
			(0.124)
ES dummy	0.012***	-0.012***	-0.063***
	(0.001)	(0.005)	(0.014)
ES TIGHT		0.030***	0.047**
		(0.007)	(0.024)
ES dummy*CIT			0.197***
			(0.051)
ES TIGHT*CIT			-0.100
			(0.083)
R^2	0.0696	0.0709	0.0731
Observations	1 260 815	1 260 815	1 260 815

In addition to CFC rules, regressions (5) to (7) model safe-harbour and earnings stripping rules, both of which represent thin-capitalization rules. Following the methodological approach by Buettner et al. (2012, pp. 935-936), we distinguish between safe-harbour rules where the safe haven debt-to-asset ratio refers to total debt or related party debt. Regression (7) is the main specification of our regression model that is also further used in the extensions (section 6).

Similarly as in regressions (1) to (4), the estimated coefficient on an affiliate's CIT rate is statistically significant and positive. Likewise, as explanatory anti-tax-avoidance policy variables are added to the model, the coefficients on variables that capture the capital structure differences between MNCs and domestic companies (MNC dummy and MNC*CIT) lose their statistical significance.

When anti-tax-avoidance policy measures are modelled using only dummy variables, as in regression (5), the estimated coefficient on CFC rules dummy is negative, which is in line with our expectations, but the coefficient is statistically insignificant. In contrast, the coefficients on the two dummies that represent thin-capitalization rules (SH dummy and ES dummy) are statistically significant at 1% level. The coefficient on SH dummy is negative, indicating that limitations on interest deductibility, as introduced by thin-capitalization rules, lead to a decrease in leverage.

At first glance, the positive coefficient on ES dummy, which implies that existence of earnings stripping rules is associated with higher leverage, might seem counter-intuitive. However, recent studies by Gresik et al. (2015, pp. 17-19) and Schindler and Schjelderup (2016, p. 17) suggest that there are conditions under which the relationship between earnings stripping rules and leverage might be positive. Earnings stripping rules specify the maximum amount of interest that can be deducted relative to EBITDA or some other earnings measure. There are two ways how a company can increase the debt level without exceeding the limit set by the rules: first, by reducing the interest expense per unit of debt and, second, by increasing EBITDA. This can be achieved by normalizing transfer pricing with respect to either the interest rate on internal debt or other input factors. As a result of such changes in transfer pricing decisions, the company can shelter a larger amount of total debt.

This implies that the positive relationship between earnings stripping rules and leverage does not necessarily signal that the policy is ineffective in curbing profit

shifting activities. Rather, earnings stripping rules may achieve a reduction in profit shifting in a different way than the other thin-capitalization policy measures.

In regression (6), we add a strictness measure of CFC rules (CFC STRICT) and tightness measures of thin-capitalization rules (SH TIGHT total, SH TIGHT related, and ES TIGHT). In regression (7), we further add interaction terms with an affiliate's CIT rate. When we compare the estimated coefficients on variables representing CFC rules from regression (4) and regression (7), the magnitude of the coefficients somewhat decrease, but the coefficients remain statistically significant at 1% level when we control for thin-capitalization rules.

Graphs 2, 3, and 4 illustrate the total effect of each policy (CFC rules, safe-harbour rules, and earnings stripping rules) on the total debt-to-asset ratio. The graphs have been constructed following the same technical approach as for graph 1.
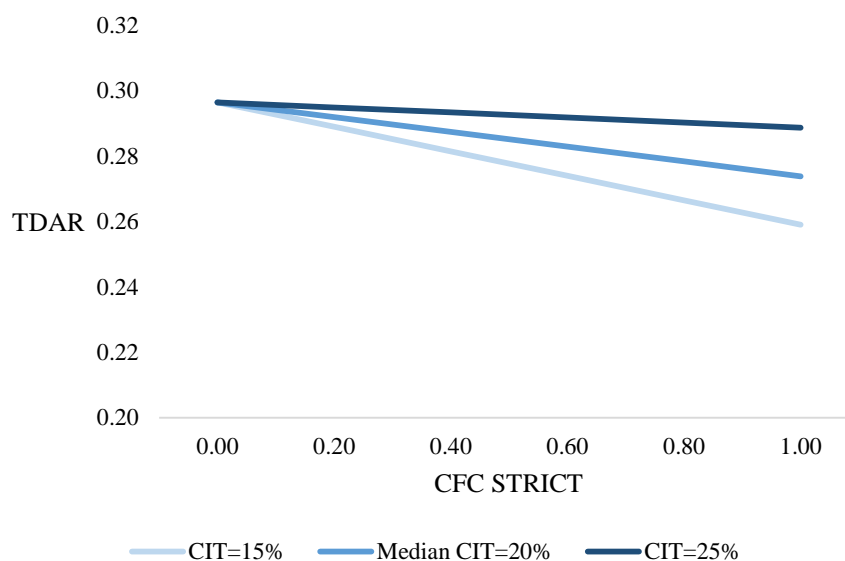
Graph 2. Regression 7: The effect of a parent country's CFC policy on an affiliate's total debt-to-asset ratio for various CIT rate levels, controlling for thin-capitalization rules. Median CIT rate refers to year 2015. In order to improve comparability of slopes, the functions have been adjusted to have a single starting point.
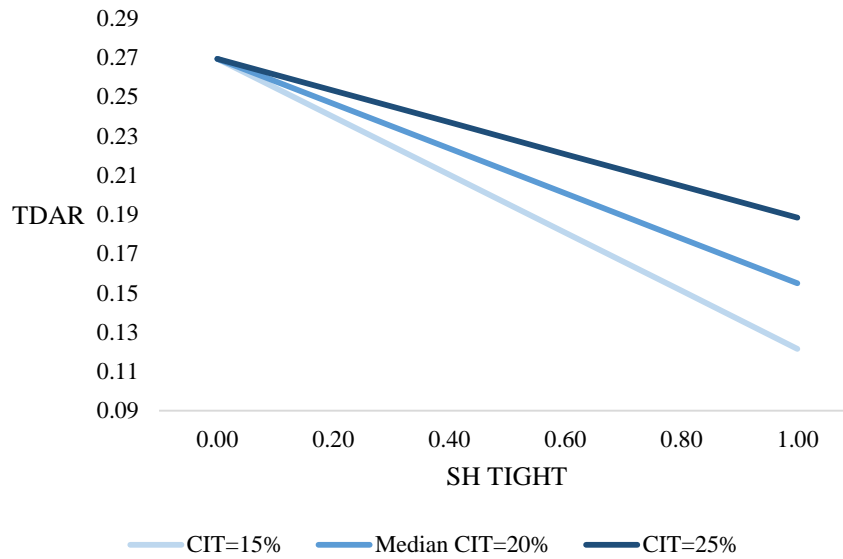
Graph 3. Regression 7: The effect of an affiliate country's safe-harbour rules on an affiliate's total debt-to-asset ratio for various CIT rate levels. Median CIT rate refers to year 2015. In order to improve comparability of slopes, the functions have been adjusted to have a single starting point.
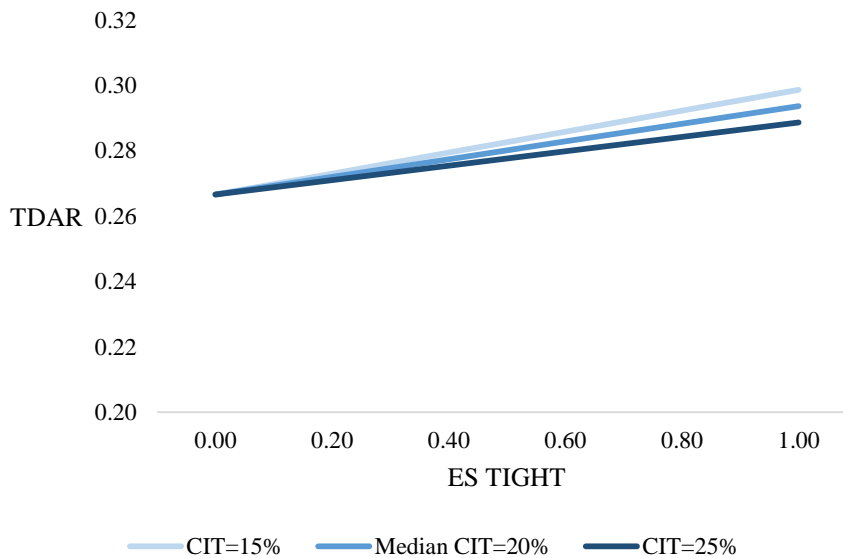
Graph 4. Regression 7: The effect of an affiliate country's earnings stripping rules on an affiliate's total debt-to-asset ratio for various CIT rate levels. Median CIT rate refers to year 2015. In order to improve comparability of slopes, the functions have been adjusted to have a single starting point.

Graph 2 allows us to draw similar inferences about the effect of CFC rules on leverage as graph 1. The negative slope of the function indicates that as strictness of CFC rules increases, the total debt-to-asset ratio decreases, and the size of this effect varies across levels of CIT rate. Referring back to our research sub-question 1, we can therefore argue that the effect of CFC rules does depend on a country's CIT rate. Graphs

3 and 4 illustrate that the two thin-capitalization policies affect the total debt-to-asset ratio, but they work in opposite directions.

An observation that is common to graphs 2, 3, and 4 is that the effect of anti-tax-avoidance policies on leverage varies across the levels of CIT rate. The potential explanation is similar to that provided for graph 1. In particular, there is some leeway in CFC rules and thin-capitalization rules, and a high CIT rate makes the companies more willing to incur concealment costs in order to reduce the taxable income base in the high-tax country (Ruf and Schindler, 2015, p. 21; Schindler and Schjelderup, 2016).

The obtained regression results also allow us to analyse how the effect of CFC rules differs for various tightness levels of thin-capitalization rules, and graph 5 illustrates these differences for five levels of SH TIGHT RELATED.
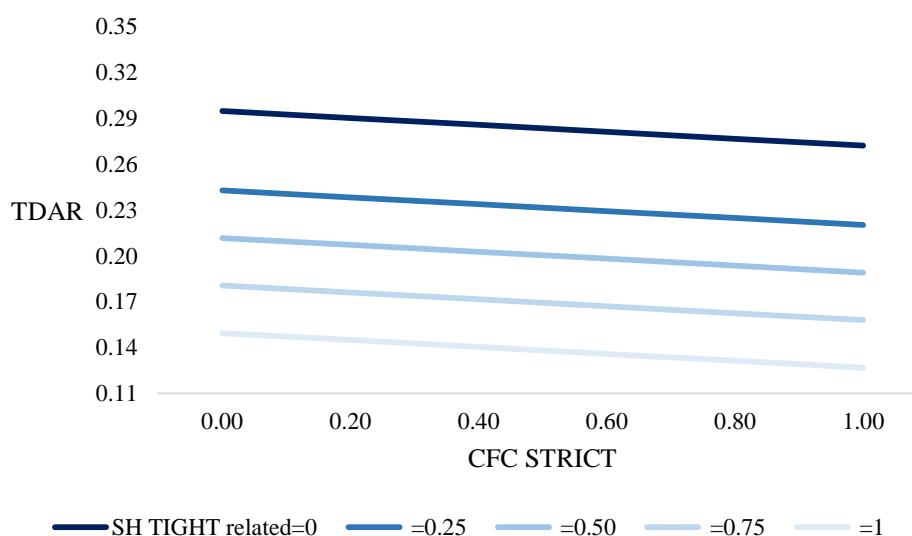
Graph 5. Regression 7: The effect of a parent country's CFC policy on an affiliate's total debt-to-asset ratio for various levels of SH TIGHT RELATED. Median CIT rate of year 2015 has been assumed.

When answering our research sub-question 2, three important observations can be made from graph 5. First, for a given level of CFC STRICT, the tighter the safe-harbour rules, the lower the predicted total debt-to-asset ratio. When SH TIGHT RELATED changes from 0 to 0.25, the decrease in the total debt-to-asset ratio is larger than in the case where SH TIGHT RELATED changes from 0.25 to 0.50, 0.50 to 0.75, or 0.75 to 1. Second, slopes of CFC STRICT functions are the same across the various levels of SH TIGHT RELATED. It suggests that with respect to leverage decisions there is hardly any interaction between CFC rules and thin-capitalization rules, rather thin-capitalization rules have only a level effect on the functions. Third, the magnitude

of the negative effect on leverage is larger for thin-capitalization rules than for CFC rules. For example, holding everything else constant, a move from 0 to 1 in SH TIGHT RELATED is associated with approximately 15% decrease in the total debt-to-asset ratio, while a move from 0 to 1 in CFC STRICT is associated with a decrease of only approximately 2%.

5.2. Control variables

This section considers the implications of the obtained coefficients on firm-level and country-level control variables (see table 8). The discussion is based on the insights gained from the review of theoretical and empirical studies in section 3.1.3.

The estimated coefficients on firm-level control variables are all statistically significant at 1% level. First, the estimated coefficient on the log of sales variable, which represents firm size, is positive, suggesting that there is a positive relationship between firm size and leverage. It can be explained by large firms being better positioned to attract debt financing and to secure favourable borrowing terms than small firms. Second, the estimated coefficient on the fixed asset ratio variable is negative. It indicates that tangibility decreases a company's incentive to seek debt financing, as ownership of fixed assets creates a non-debt tax shield via depreciation expenses. Third, the results suggest that higher profitability is associated with lower leverage. This negative relationship is in line with the pecking order theory, which argues that internal funds are cheaper than the external ones and therefore profitable firms will opt for retained earnings when seeking funds for financing their operations and investments. In addition, profit increases book and market value of equity and thereby decreases the total debt-to-asset ratio, unless the firm takes a targeted action to prevent it. Fourth, the estimated coefficient on the loss-carry-forward variable is positive, suggesting that firms that do have loss-carry-forwards are in financial difficulties and experience a deterioration of their equity capital.

Also the estimated coefficients on the country-level control variables are all statistically significant at 1% level. First, the relationship between inflation and leverage is found to be positive. In an inflationary environment, the nominal interest rates rise and the value of the debt tax shield increases, thereby making debt financing more attractive. Second, the estimated coefficient on the log of corruption variable is negative. In our research, the corruption index is within the interval from 0 to 10, where 0 indicates a very high corruption level. Accordingly, the negative relationship implies

that European firms operating in highly corrupt countries have higher leverage than their counterparts operating in countries with low levels of corruption. This finding is consistent with the view that in a corrupt environment debt investors are better positioned than equity investors to ensure fulfilment of contracts and therefore provide financing more readily. Third, our results indicate that higher growth opportunities are associated with higher leverage. This finding suggests that companies experiencing high growth can attract debt financing and meet the obligations more easily than low-growth companies. In addition, lenders might prefer investing in high-growth industries and countries. Fourth, the estimated coefficient on the log of creditor rights index variable is negative. This finding is consistent with the demand side view, which argues that strong creditor protection incentivizes managers to limit the firm's leverage in order to reduce cash-flow uncertainty and the risk of losing their position.

6. Extensions

In this section, we extend our regression analysis. We start by controlling for transfer pricing rules in our main model. Next, we consider the Cadbury-Schweppes case and test how effectiveness of CFC rules has changed since this landmark case. Next, we distinguish between countries that have and do not have thin-capitalization rules and test effectiveness of CFC rules for both cases. Finally, we test whether substituting effective CIT rate for statutory CIT rate changes the regression results.

6.1. Impact of transfer pricing rules

MNCs can shift financial income, first, by distorting capital structure via intra-group lending and, second, by distorting interest rates on related debt (Lohse and Riedel, 2013, p. 12). Countries design anti-tax-avoidance policy measures that aim to limit excessive profit shifting activities by MNCs, and we have analysed two of these measures, namely, CFC rules and thin-capitalization rules, and their effect on leverage in the previous sections. However, since the majority of MNCs considers transfer pricing to be a very important or even the most important tax issue (Lohse and Riedel, 2013, p. 2) and transfer pricing rules impose restrictions on the interest rates on related debt, we recognize that these rules do have an effect on the capital structure decisions of MNCs. In this section, we extend our main specification and control for transfer pricing rules.

Transfer pricing rules are one of the three main mechanisms used by tax authorities to protect the domestic tax base. These rules determine the conditions, such as transfer price, for intra-group transactions and affect the allocation of profit across related parties. It is common for tax authorities to use the arm's length price as a reference value for evaluating and setting the transfer price for tax purposes (OECD, 2015b). According to the arm's length principle, transfer prices of intra-firm transactions must correspond to prices that would have been set by independent or unrelated parties.

Lohse and Riedel (2013) examine profit shifting of MNCs that is done via intra-firm transfer price distortion and analyse whether transfer pricing rules are effective in restricting such behaviour. The authors collect and categorize information on the development of transfer pricing legislations in Europe and combine it with company-level panel data on MNCs. The obtained results suggest that introduction or tightening

of transfer pricing rules effectively reduce international profit shifting activities, and, although transfer pricing rules impose high administrative costs on both firms and tax authorities, the overall welfare effect is positive.

Even though in some situations both transfer pricing rules and CFC rules target the same income, neither of them fully captures the income that the other aims to capture (OECD, 2015a). Given that most CFC regimes automatically attribute geographically mobile income regardless of whether the income was earned from an intra-group transaction, the existence of transfer pricing rules does not eliminate the necessity for CFC rules. Furthermore, CFC rules are more mechanical and easier to administrate.

In order to construct the explanatory variables representing transfer pricing rules, we use the data set from Lohse and Riedel (2013, p. 20) for the period from 2004 to 2009. The authors evaluate existence and strictness of transfer pricing documentation requirements for 26 European countries and code this evaluation by assigning a score of 1, 2, or 3 for each country-year observation. A score of 1 indicates that there are no transfer pricing rules or the rules are very limited. A score of 2 means that transfer pricing documentation is regularly required, but the rules are nevertheless weak. A score of 3 implies that transfer pricing rules specify the documentation requirements and the documents need to be handed in upon request or within a set deadline. Given that our study covers a longer time period (2004 - 2015), we extend the data set by Lohse and Riedel (2013) by adding data for the 26 countries for the years from 2010 to 2015.[11]

Table 10 displays the original regression (7) and regressions (8) to (10), which control for transfer pricing rules. In regression (8), we introduce a policy dummy (TP dummy), which equals 1 if an affiliate's country had transfer pricing rules in a particular year, and 0 otherwise. Next, in regression (9), we add a strictness measure of transfer pricing rules (TP STRICT), which takes value 0, 0.5, or 1.[12] An interaction term (TP dummy*CIT) is added in regression (10).[13]

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[11] We follow the coding system by Lohse and Riedel (2013) and obtain information on transfer pricing rules from Deloitte (2015b), EY (2013), and IBFD (1991-2015).

[12] For our research purposes, we transform the coding system values of 1, 2, and 3 by Lohse and Riedel (2013) into values of 0, 0.5, and 1, respectively, see Appendix H for a detailed overview.

[13] An interaction term (TP STRICT*CIT) is dropped due to collinearity issues.

It can be observed from table 10 that signs and significance levels of the estimated coefficients are largely unchanged if compared to regression (7). In regression (10), however, the estimated coefficient on an affiliate's CIT rate becomes negative, as the interaction term (TP dummy*CIT) is added to the regression. The statistically significant and positive coefficient on the interaction term captures the positive effect of the affiliate's CIT rate variable, explaining the change in the sign of the coefficient on the affiliate's CIT rate variable. For CFC rules, all four coefficients on explanatory variables are statistically significant at 1% level and the total effect of the policy on leverage is negative, as in graph 2. This suggests an answer to our research sub-question 3. In particular, the magnitude of the effect of CFC rules on capital structure does not change substantially when we control for transfer pricing rules. Also total policy effect of safe-harbour rules on leverage remains statistically significant and negative, as in graph 3.

A noteworthy observation is that, when we control for transfer pricing rules, the estimated coefficients on the explanatory variables representing earnings stripping rules become statistically insignificant. As discussed in section 5.1., page 65, in regression (7), we observe that the total effect of earnings stripping policy on leverage is positive. Earnings stripping rules may trigger changes in a company's transfer pricing decisions, for example, in setting normalized interest rates in order to shelter a larger amount of internal debt. Transfer pricing rules generally also address internal interest rates, and as the rules require normalization of interest rates, a company may be incentivised to increase internal leverage in order to shift the same amount of profit via intra-group lending. Therefore, it can be argued that earnings stripping rules and transfer pricing rules may lead to similar changes in a company's transfer pricing decisions with respect to internal interest rates and, in turn, leverage (graph 6). This indicates that, as argued by Schindler and Schjelderup (2016), interest rate mispricing and debt shifting are concealment cost substitutes. It appears that, when we control for transfer pricing rules, the coefficients on the added explanatory variables absorb the effect of earnings stripping rules on leverage.

Table 10. The effect of transfer pricing policy on total debt-to-asset ratio

The dependent variable is an affiliate's total debt-to-asset ratio (TDAR). TP refers to transfer pricing rules. Variable definitions are summarized in Appendix B. Parent, industry, and year fixed effects are included. Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Control variables included, see section 3.1.3.

	(7) Original	(8)	(9)	(10)
Affiliate's CIT	0.110***	0.117***	0.111***	-0.340***
	(0.022)	(0.023)	(0.023)	(0.118)
MNC dummy	0.012*	-0.010	-0.010	-0.012*
	(0.006)	(0.007)	(0.007)	(0.007)
MNC*CIT	-0.023	0.039*	0.045*	0.050**
	(0.022)	(0.023)	(0.023)	(0.023)
CFC dummy	0.028**	0.043***	0.038***	0.039***
	(0.014)	(0.014)	(0.014)	(0.014)
CFC STRICT	-0.082***	-0.066***	-0.056***	-0.057***
	(0.019)	(0.020)	(0.020)	(0.020)
CFC dummy*CIT	-0.109***	-0.162***	-0.160***	-0.164***
	(0.041)	(0.043)	(0.043)	(0.043)
CFC STRICT*CIT	0.297***	0.266***	0.251***	0.256***
	(0.058)	(0.060)	(0.060)	(0.060)
SH dummy	-0.009	-0.023**	-0.043***	-0.042***
	(0.011)	(0.012)	(0.012)	(0.012)
SH TIGHT TOTAL	0.095***	0.192***	0.263***	0.256***
	(0.036)	(0.039)	(0.039)	(0.039)
SH TIGHT RELATED	-0.343***	-0.528***	-0.381***	-0.381***
	(0.041)	(0.043)	(0.044)	(0.044)
SH dummy*CIT	-0.059	0.013	0.107***	0.101**
	(0.036)	(0.040)	(0.040)	(0.040)
SH TIGHT TOTAL*CIT	-0.424***	-0.868***	-1.222***	-1.192***
	(0.132)	(0.139)	(0.140)	(0.140)
SH TIGHT RELATED*CIT	1.092***	1.525***	1.011***	1.017***
	(0.124)	(0.130)	(0.132)	(0.132)
ES dummy	-0.063***	-0.056***	-0.025	-0.024
	(0.014)	(0.015)	(0.015)	(0.015)
ES TIGHT	0.047**	0.042*	0.001	-0.000
	(0.024)	(0.025)	(0.025)	(0.025)
ES dummy*CIT	0.197***	0.160***	0.064	0.055
	(0.051)	(0.055)	(0.055)	(0.055)
ES TIGHT*CIT	-0.100	-0.049	0.076	0.087
	(0.083)	(0.087)	(0.087)	(0,087)
TP dummy		-0.016***	-0.035***	-0.123***
		(0.004)	(0.005)	(0.023)
TP STRICT			0.029***	0.029***
			(0.002)	(0.002)
TP dummy*CIT				0.457***
				(0.116)
R^2	0.0731	0.0729	0.0735	0.0736
Observations	1 260 815	1 222 044	1 222 044	1 222 044
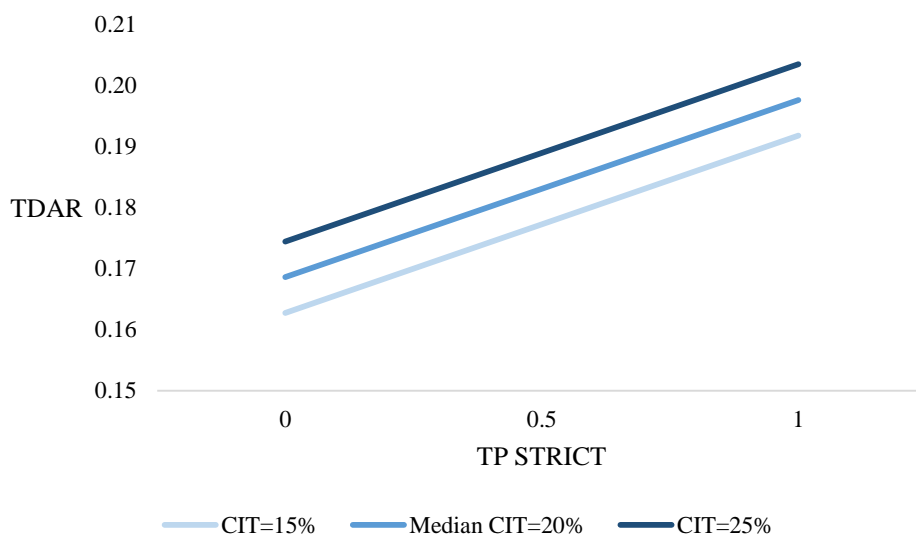
Graph 6. Regression 10: The effect of an affiliate country's transfer pricing policy on an affiliate's total debt-to-asset ratio. Median CIT rate refers to year 2015.

6.2. Cadbury-Schweppes (C-196/04) case

As discussed in section 1.1.2., a turning point in the development of CFC rules was the decision of the ECJ in the Cadbury-Schweppes (C-196/04) case of 12 September 2006. The ECJ ruled that CFC rules cannot be applied to a foreign affiliate that resides in an EEA country and carries out genuine economic activity.

In order to test whether the Cadbury-Schweppes case has diminished or even eliminated effectiveness of CFC rules, we run our main specification on two different data samples. The first data sample covers the period before the Cadbury-Schweppes case, namely the time period from 2004 to 2006[14]. The second data sample covers the time period from 2007 to 2015.

Table 11 presents the estimated results of regressions (11)[15] and (12) and of the original regression (7). It can be observed from regression (12) that also after the Cadbury-Schweppes case the estimated coefficients on all variables that represent CFC rules are statistically significant at 1% or 5% level. However, relative to the period before the case, the magnitude of the negative effect is substantially lower. It is particularly evident in graph 7.

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[14] As our main data set covers the time period from 2004 to 2015, for this extension the time period before the Cadbury-Schweppes (C-196/04) case is limited to the three years from 2004 to 2006.
[15] Variables ES TIGHT and ES TIGHT*CIT are dropped due to collinearity issues.
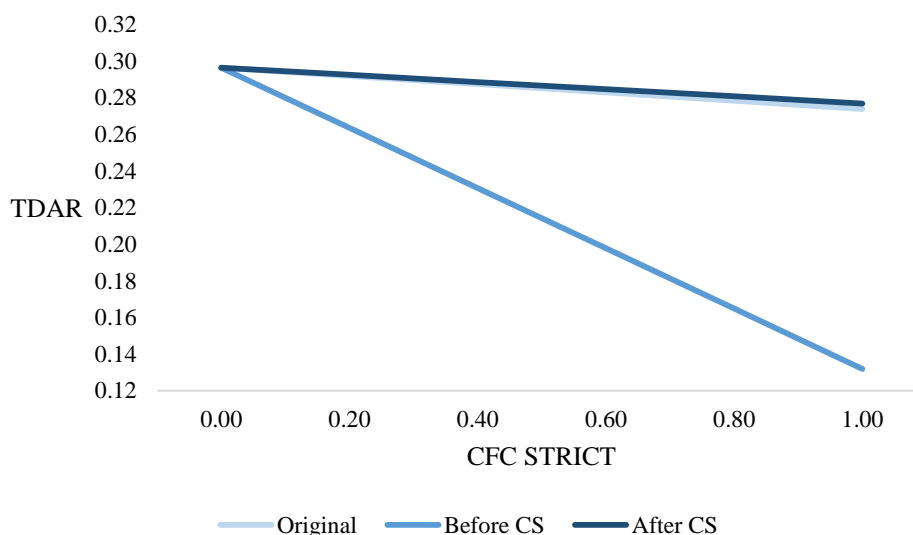
Graph 7. Regressions 7, 11, 12: The effect of a parent country's CFC policy on an affiliate's total debt-to-asset ratio, accounting for the Cadbury-Schweppes case. Median CIT rate of year 2015 has been assumed. In order to improve comparability of slopes, the functions have been adjusted to have a single starting point.

Slope of the function that describes the period before the Cadbury-Schweppes case is considerably steeper than slopes of the functions describing the original period and the period after the case. Therefore, it can be argued that the Cadbury-Schweppes case has indeed reduced the effect that CFC rules have on leverage. As summarized in table 2, page 29, European countries implemented various changes in their CFC regimes in order to ensure compliance with the ECJ ruling on the Cadbury-Schweppes case, and our results suggest that the case has affected tax planning decisions, and thereby also capital structure, of European MNCs.

Nevertheless, also after the Cadbury-Schweppes case the estimated coefficients on all variables that represent CFC rules are statistically significant at 1% or 5% level. Since CFC rules continue to apply to foreign affiliates that reside in non-EEA countries, they still can play a role in corporate decision making. In particular, it can be presumed that MNCs make tax planning and, in turn, capital structure decisions by considering the entire MNC group. It implies that the level of internal debt, and thus also the capital structure, of an affiliate located in an EEA country is affected by CFC rules that apply to the internal bank that is located in a non-EEA country and belongs to the same MNC group.

With respect to research sub-question 4, we can argue that Cadbury-Schweppes case has weakened the effect of CFC rules on capital structure of European MNCs; however, the effect remains statistically significant.

Table 11. The effect of Cadbury-Schweppes (C-196/04) case

The dependent variable is total debt-to-asset ratio (TDAR). Variable definitions are summarized in Appendix B. Parent, industry, and year fixed effects are included. Standard errors in parentheses * $p <$ 0.10, ** $p < 0.05$, *** $p < 0.01$. Control variables included, see section 3.1.3.

	(7) Original	(11) 2004-2006 Before CS	(12) 2007-2015 After CS
Affiliate's CIT	0.110***	-0.082	0.169***
	(0.022)	(0.116)	(0.026)
MNC dummy	0.012*	-0.014	0.006
	(0.006)	(0.038)	(0.007)
MNC*CIT	-0.023	0.022	0.009
	(0.022)	(0.111)	(0.026)
CFC dummy	0.028**	0.181***	0.033**
	(0.014)	(0.060)	(0.016)
CFC STRICT	-0.082***	-0.301***	-0.091***
	(0.019)	(0.093)	(0.022)
CFC dummy*CIT	-0.109***	-0.365**	-0.155***
	(0.041)	(0.167)	(0.046)
CFC STRICT*CIT	0.297***	0.683***	0.357***
	(0.058)	(0.263)	(0.063)
SH dummy	-0.009	-0.191***	0.048***
	(0.011)	(0.049)	(0.012)
SH TIGHT TOTAL	0.095***	0.615***	-0.011
	(0.036)	(0.208)	(0.040)
SH TIGHT RELATED	-0.343***	-0.029	-0.486***
	(0.041)	(0.169)	(0.046)
SH dummy*CIT	-0.059	0.635***	-0.297***
	(0.036)	(0.158)	(0.042)
SH TIGHT TOTAL*CIT	-0.424***	-2.212***	-0.009
	(0.132)	(0.721)	(0.150)
SH TIGHT RELATED*CIT	1.092***	-0.021	1.631***
	(0.124)	(0.523)	(0.143)
ES dummy	-0.063***	-0.049	-0.076***
	(0.014)	(0.081)	(0.015)
ES TIGHT	0.047**		0.084***
	(0.024)		(0.027)
ES dummy*CIT	0.197***	0.188	0.215***
	(0.051)	(0.481)	(0.055)
ES TIGHT*CIT	-0.100		-0.195**
	(0.083)		(0.094)
R^2	0.0731	0.0783	0.0723
Observations	1 260 815	112 924	1 147 891

6.3. Impact of thin-capitalization rules

The aim of this extension is to test how the effect of CFC rules on capital structure of an affiliate changes depending on whether its country of residence has thin-capitalization rules or not. As discussed in section 2.2., CFC rules and thin-capitalization rules can be regarded as complementary policies, and the two sets of rules interact when attempting to curb profit shifting activities.

We run our main specification on two different data samples, see table 12. Regression (13) is based on a data sample that contains only those countries that have not implemented thin-capitalization rules, and regression (14) is based on a data sample that contains countries that have implemented thin-capitalization rules. The coefficients on explanatory variables representing CFC rules are statistically insignificant in regression (13). This could be explained by the fact that in our data set there are only three countries (Iceland, Norway, and Sweden) that have implemented CFC rules, but do not have general thin-capitalization legislation (table 6). In regression (14), all coefficients of interest, except for the coefficient on CFC dummy, are statistically significant. We study how the magnitude and statistical significance of coefficients from both regressions differ from those obtained in the original regression (7).

The obtained regression results are visualized in graph 8. The magnitude of the effect of CFC rules on leverage is relatively lower in countries where thin-capitalization rules are implemented. Although, in regression (14), the effect of CFC rules is statistically significant, graph 8 suggests that the economic significance of the effect might be limited. This decrease in the magnitude of the effect of CFC rules in presence of thin-capitalization rules likely reflects complementarity of the two policies and the argument that it is leeway in a country's thin-capitalization rules that allows CFC rules to still have some effect on leverage (Haufler et al., 2016, p. 4).

Table 12. The effect of thin-capitalization rules

The dependent variable is total debt-to-asset ratio (TDAR). Variable definitions are summarized in Appendix B. Parent, industry, and year fixed effects are included. Standard errors in parentheses * $p <$ 0.10, ** $p < 0.05$, *** $p < 0.01$. Control variables included, see section 3.1.3.

	(7) Original	(13) no TC	(14) TC
Affiliate's CIT	0.110***	0.057	1.117***
	(0.022)	(0.035)	(0.174)
MNC dummy	0.012*	-0.005	0.022***
	(0.006)	(0.015)	(0.008)
MNC*CIT	-0.023	0.038	-0.065**
	(0.022)	(0.061)	(0.026)
CFC dummy	0.028**	0.018	0.021
	(0.014)	(0.037)	(0.016)
CFC STRICT	-0.082***	-0.055	-0.055**
	(0.019)	(0.052)	(0.022)
CFC dummy*CIT	-0.109***	-0.021	-0.088*
	(0.041)	(0.129)	(0.047)
CFC STRICT*CIT	0.297***	0.082	0.246***
	(0.058)	(0.173)	(0.067)
SH dummy	-0.009		0.219***
	(0.011)		(0.059)
SH TIGHT TOTAL	0.095***		0.232***
	(0.036)		(0.040)
SH TIGHT RELATED	-0.343***		-0.155***
	(0.041)		(0.046)
SH dummy*CIT	-0.059		-0.718***
	(0.036)		(0.177)
SH TIGHT TOTAL*CIT	-0.424***		-0.884***
	(0.132)		(0.143)
SH TIGHT RELATED*CIT	1.092***		0.458***
	(0.124)		(0.139)
ES dummy	-0.063***		-0.208***
	(0.014)		(0.036)
ES TIGHT	0.047**		0.584***
	(0.024)		(0.125)
ES dummy*CIT	0.197***		0.773***
	(0.051)		(0.141)
ES TIGHT*CIT	-0.100		-1.833***
	(0.083)		(0.407)
R^2	0.0731	0.0364	0.0951
Observations	1 260 815	368 482	892 333
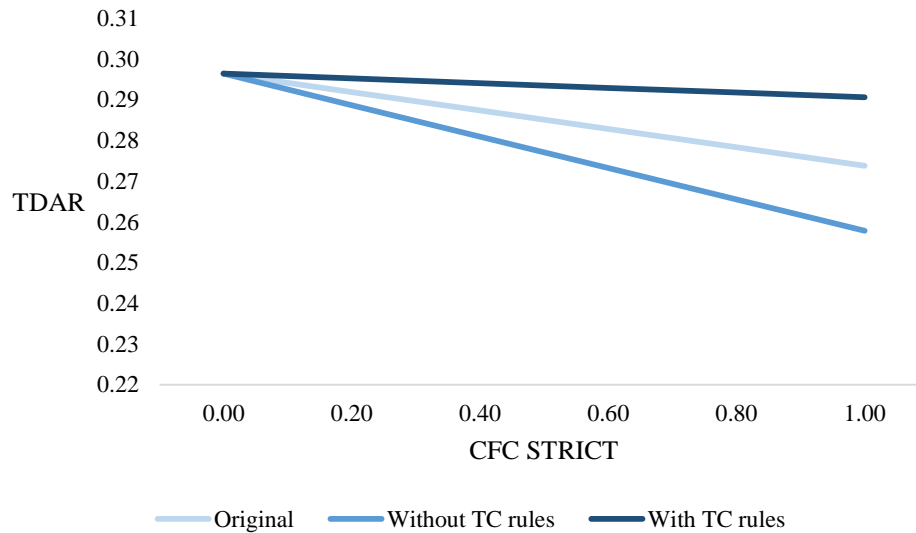
Graph 8. Regressions 7, 13, 14: The effect of a parent country's CFC policy on an affiliate's total debt-to-asset ratio, depending on thin-capitalization rules. Median CIT rate of year 2015 has been assumed. In order to improve comparability of slopes, the functions have been adjusted to have a single starting point.

6.4. Statutory versus effective CIT rate

MNCs are often regarded as being able to reduce the effective CIT rate by employing international tax planning strategies, most of which are unavailable to purely domestic companies. Furthermore, as summarized in table 1, page 22, the majority of countries that have implemented CFC rules define low taxation by referring to the effective tax burden of the foreign affiliate.

We test whether the regression results change, when we substitute the effective CIT rate for the statutory CIT rate in our main specification, regression (7). Effective CIT rate for each affiliate-year observation is computed as tax paid by an affiliate divided by its earnings before tax. The necessary data is obtained from Amadeus data base.

As it can be seen from table 13, the overall significance of the coefficients on variables representing CFC rules has decreased, when we substitute the effective CIT rate for the statutory CIT rate. Still, the coefficient on CFC STRICT remains negative and statistically significant at 5% level.

Table 13. Statutory versus Effective CIT

The dependent variable is total debt-to-asset ratio (TDAR). Variable definitions are summarized in Appendix B. Parent, industry, and year fixed effects are included. Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Control variables included, see section 3.1.3.

	(7) Original (Statutory CIT rate)	(15) Effective CIT rate
Affiliate's CIT	0.110***	0.042***
	(0.022)	(0.005)
MNC dummy	0.012*	0.010***
	(0.006)	(0.004)
MNC*CIT	-0.023	-0.005
	(0.022)	(0.008)
CFC dummy	0.028**	0.014
	(0.014)	(0.009)
CFC STRICT	-0.082***	-0.031**
	(0.019)	(0.013)
CFC dummy*CIT	-0.109***	-0.034*
	(0.041)	(0.018)
CFC STRICT*CIT	0.297***	0.027
	(0.058)	(0.026)
SH dummy	-0.009	-0.078***
	(0.011)	(0.004)
SH TIGHT TOTAL	0.095***	0.126***
	(0.036)	(0.014)
SH TIGHT RELATED	-0.343***	0.228***
	(0.041)	(0.012)
SH dummy*CIT	-0.059	0.143***
	(0.036)	(0.013)
SH TIGHT TOTAL*CIT	-0.424***	-0.294***
	(0.132)	(0.051)
SH TIGHT RELATED*CIT	1.092***	-0.575***
	(0.124)	(0.038)
ES dummy	-0.063***	-0.006
	(0.014)	(0.009)
ES TIGHT	0.047**	0.040***
	(0.024)	(0.012)
ES dummy*CIT	0.197***	-0.008
	(0.051)	(0.034)
ES TIGHT*CIT	-0.100	-0.064
	(0.083)	(0.048)
R^2	0.0731	0.0624
Observations	1 260 815	939 614

An interesting observation can be made by analysing graph 9, which visualizes the obtained results. The function that uses the effective CIT rate has lower total debt-to-asset ratio for every level of CFC STRICT. Since it is reasonable to expect that the effective CIT rate for MNCs is lower than the statutory CIT rate, it can be argued that the attractiveness of debt as a tool for reducing tax liability is diminished. Nevertheless, the slopes of both functions are essentially the same. Referring back to research sub-question 5, it suggests that effectiveness of CFC rules in limiting leverage and, in turn, profit shifting activities of MNCs does not depend on the way how an affiliate's CIT rate is defined. Also from a theoretical point of view, tax savings depend on the statutory rather than the effective CIT rate, and therefore, usage of statutory CIT rate in our main regressions can be justified.
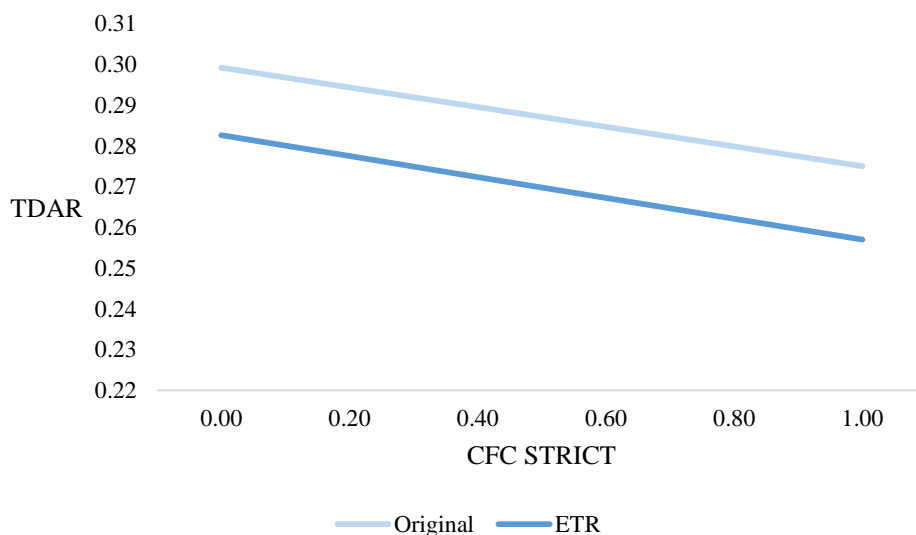
Graph 9. Regressions 7, 15: The effect of a parent country's CFC policy on an affiliate's total debt-to-asset ratio, depending on definition of CIT rate. Median CIT rate of year 2015 has been assumed.

Conclusions

Countries introduce various anti-tax-avoidance measures in their tax legislations with the aim to limit profit shifting activities of MNCs. Controlled foreign company (CFC) rules, thin-capitalization rules, and transfer pricing rules are three of such anti-tax-avoidance measures. Over the last years, the number of countries that have implemented these measures has grown considerably, which reaffirms that attempts to limit profit shifting and base erosion have been among the key priorities of many countries and international organizations.

Currently, more than 15 European countries have implemented CFC regimes. Overall, there are some fundamental principles that are common to CFC regimes across all countries; nevertheless, the exact design of the rules varies, reflecting countries' fiscal aims, administrative capabilities, and differences in tax legislations. If, subject to certain conditions, CFC rules are applied, income of a foreign affiliate is added to the tax base of the parent and taxed at the tax rate of the parent's country of residence. A turning point in the applicability of CFC rules has been the Cadbury-Schweppes (C-196/04) case, which has substantially limited the applicability of CFC rules within the EEA.

In this thesis, we study the development of CFC rules and assess the effect that CFC rules have on capital structure decisions of MNCs. Our research consists of two interrelated parts. First, we review the development of CFC regimes in Europe, the US, and Canada (2000 - 2015). Second, we create a panel data set of European companies with parents headquartered in Europe, the US, or Canada (2004 - 2015). This data set, which contains financial and historical ownership data, is further used in econometric analysis.

The obtained results suggest that a parent country's CFC rules have a negative effect on an affiliate's total debt-to-asset ratio and that an increase in strictness of CFC rules is associated with a further decrease in leverage. Our analysis also allows us to answer the proposed research sub-questions.

First, we find that the effect of CFC rules on capital structure does depend on a country's corporate income tax (CIT) rate. In particular, the total debt-to-asset ratio is less responsive to changes in strictness of CFC rules for higher levels of CIT rate. Assuming that CFC rules are not perfectly binding, a potential explanation is that a high

CIT rate implies that it is more valuable to preserve the volume of profit shifted and, therefore, companies are more willing to incur concealment costs in order to reduce the taxable income base in the high-tax country.

Second, when assessing whether the effect of CFC rules on capital structure depends on tightness of a country's thin-capitalization rules, our results suggest that the magnitude of the effect of CFC rules on leverage is relatively lower in countries where thin-capitalization rules are implemented. However, the effect of CFC rules remains statistically significant when we control for thin-capitalization rules, suggesting that the two sets of rules are complementary.

Third, we find that the magnitude of the effect of CFC rules on capital structure does not change substantially when we control for transfer pricing rules. The estimated coefficients on explanatory variables representing CFC rules remain statistically significant, and the total effect on an affiliate's leverage remains negative.

Fourth, we assess whether the Cadbury-Schweppes (C-196/04) case has weakened the effect of CFC rules on capital structure of European MNCs. We observe that, relative to the years preceding the case, the magnitude of the negative effect of CFC rules on an affiliate's leverage is substantially lower in the period after the case. However, as the estimated coefficients remain statistically significant, we argue that the role of CFC rules in corporate decision making should not be disregarded.

Fifth, as the effective CIT rate is substituted for the statutory CIT rate, the results suggest that effectiveness of CFC rules does not depend on the way how an affiliate's CIT rate is defined. As tax savings depend on the statutory rather than the effective CIT rate, we can justify usage of statutory CIT rate in our main regressions.

Overall, our empirical analysis suggests the following answer to our main research question: CFC rules do have an effect on capital structure of European multinational companies. More specifically, a parent country's CFC rules have a negative effect on an affiliate's leverage, suggesting that effective CFC rules make internal lending as a profit shifting channel less attractive for MNCs.

Our analysis allows us to draw conclusions about the effects of other anti-tax-avoidance measures on an affiliate's leverage. In our thesis, in addition to CFC rules, we model thin-capitalization rules (further distinguishing between safe-harbour rules and earnings stripping rules) and transfer pricing rules. We find that safe-harbour rules

have a statistically significant negative effect on an affiliate's leverage, indicating that limitations on interest deductibility, defined in terms of a safe-harbour debt-to-equity ratio, lead to a decrease in leverage. In contrast, earnings stripping rules specify the maximum amount of interest that can be deducted relative to an earnings measure. The finding that the relationship between earnings stripping rules and leverage is positive might seem counter-intuitive at first. However, earnings stripping rules can lead to changes in a company's transfer pricing decisions. Instead of decreasing its debt level, a company might respond to earnings stripping rules by reducing the mispricing of interest rates on internal debt or other input factors, which allows the company to shelter an even larger amount of debt. This implies that earnings stripping rules can indeed be effective in reducing profit shifting, but achieve this reduction in a different way than the other thin-capitalization policy measures. The effect of transfer pricing rules on an affiliate's leverage is also statistically significant and similar to that of earnings stripping rules.

The results of our thesis suggest that CFC rules, thin-capitalization rules, and transfer pricing rules are all effective in limiting profit shifting activities by European MNCs. This conclusion is drawn by analysing statistical significance of the estimated coefficients on the policy variables. We believe that an assessment of the economic significance of anti-tax-avoidance policy measures would help to bridge the gap between econometric analysis and actual policy implications and, therefore, would be a valuable continuation of our study.

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Appendix A. Notes to table 1

The Appendix provides notes to table 1, page 22, which summarizes the development and key elements of CFC regimes in Europe, the US, and Canada. The information is based on the European Tax Handbooks by IBFD (1991-2015), Guide to Controlled Foreign Company Regimes by Deloitte (2014), Bräutigam et al. (2015), and Rohatgi (2007).

(a) Canada's CFC regime consists of Foreign Affiliate (FA) rules, which include the Foreign Accrual Property Income (FAPI) provisions.

(b) In 2013, changes were enacted to CFC rules, in particular, regarding the computation of FAPI and capital gains realized by FAs, the liquidation and reorganization of FAs, and the treatment of loans made by FAs.

(c) Finland periodically publishes a list of countries whose tax burden is deemed to be significantly lower than that of Finland. The following European countries were included in the list published in 2014: Bosnia and Herzegovina, Georgia, Macedonia, Moldova, Montenegro, Serbia, and Switzerland.

(d) CFC rules do not apply to a foreign entity residing in a tax treaty country if (1) the entity is subject to an effective tax rate of at least 75% of the Finnish CIT rate and (2) the entity is not subject to special tax treatment.

(e) Income from permanent establishments is taxed as business profit, income from legal entities - as passive income. For income from permanent establishments, it is necessary to analyse whether the tax treaty contains a clause that allows France to apply CFC rules. If not, treatment of the income depends on whether the tax treaty uses exemption or credit method for eliminating double taxation. Distributed income from legal entities, such as foreign subsidiaries, generally is taxable in the state of residence of the recipient.

(f) From 1993, the participation threshold had been reduced to 10% of share capital or an investment in the foreign entity at a cost price of at least EUR 22.8 million; however, transitional rules applied until December 31, 2002.

(g) Whether a jurisdiction qualifies as a low-tax jurisdiction is determined by referring to the specific situation of the foreign entity.

(h) If income of the foreign entity consists of passive income with an investment character, the deemed dividend rules apply already if one German resident shareholders holds at least 1% of the share capital or the voting power in the foreign entity. Under certain conditions, the deemed dividend rules apply even if the participation is less than 1%.

(i) The Annual Tax Act 2010 expanded the definition of "low taxation" for CFC purposes so that tax credits and refunds are taken into account when determining the effective tax burden of the foreign entity.

(j) CFC rules apply if the foreign entity is subject to taxation in a non-cooperative country (a Black list of countries that are non-cooperative is periodically issued) or a country with a preferential tax regime (a list of countries that have preferential tax regimes is yet to be issued).

(k) The exemption applies if the foreign entity has a real economic presence in the country: manufacturing, processing, service providing, investment or commercial activity performed with the foreign entity's own assets and employees.

(l) The exemption applies if the income of the CFC is not mainly financial income.

(m) CFC rules were approved in 2000, but became effective in 2001, after the publishing of the Black list.

(n) Italy publishes a Black list, which includes countries that do not ensure sufficient exchange of tax information and that do not impose a sufficiently high level of taxation. The Black list is abolished from 2016, and the low taxation requirement remains the general criterion that determines applicability of CFC rules.

(o) CFC rules do not apply to foreign entities organized in the countries that are included in the Black list, as these entities are covered by other specific anti-tax-avoidance measures.

(p) (1) Active income and non-distributed dividends are exempted if certain establishment requirements are satisfied; CFC income is not attributed if (2) CFC income is comprised only of dividends from the controlling company, (3) the de minimis test is satisfied.

(r) Binding White and Black lists of countries are issued annually; these lists indicate, which countries have or do not have sufficiently high taxation.

(s) CFC rules apply to foreign entities residing in treaty countries only if the foreign entity's income is mainly of a financial nature.

(t) For the definition of low-tax jurisdictions, CFC rules refer to the general anti-tax-avoidance provisions. The jurisdictions are defined in terms of (1) listed tax havens and (2) countries where the tax paid is less than 60% of the applicable general Portuguese CIT rate.

(u) Until January 1, 2016, a transitional regime, where a controlling person is defined as one holding at least 50% of shares, applied.

(v) See the listed exemptions for how the Low taxation threshold and country exemptions are applied.

(z) CFC rules do not apply to a foreign entity residing in a jurisdiction that has concluded a tax treaty and exchanges tax information with Russia, where (a) the jurisdiction has an effective tax rate of at least 75% of the average CIT rate in Russia or (b) at least 80% of the CFC's profit is from active income or (c) the CFC is a licensed bank or an insurance company.

(aa) Spain's International Fiscal Transparency regime is equivalent to a CFC regime.

(ab) CFC rules can apply to the income from certain foreign entities located in Gibraltar (included from 2009 to 2015), Cyprus or Luxembourg (included from 2008 to 2014). Since 2008, subject to certain conditions, the rules do not apply to income from entities that reside within the EU.

(ac) Within the EEA, certain income arising from Belgium, Estonia, Ireland, Luxembourg, and Netherlands has been excluded from the exemption implied by the "white list".

(ad) Cyprus and Spain are the European treaty countries that have been excluded from the exemption implied by the "white list".

(ae) See the Finance Act 2012 for detailed information on the new, redesigned CFC regime that aims to improve tax competitiveness of the UK.

(af) See the Gateway test that exempts certain sources of income and the listed entity-level exemptions.

(ag) Apart from the low taxation threshold, a foreign entity is deemed to reside in a low taxation country if a special tax regime (designer tax rates) applies.

(ah) The Inland Revenue publishes a list of countries that are not regarded as low-tax jurisdictions, provided that at least 90% of the CFC income is sourced in the CFC's country of residence.

(ai) The anti-tax-avoidance and anti-tax-haven legislation of the US is complex; when reviewing the CFC regime of the US, other provisions, such as for passive foreign investment companies, personal holding companies, conduit financing transactions and payments to transparent entities, need to be considered.

(aj) CFC regime was expanded under the Tax Reform Act 1986.

(ak) Foreign base company (FBC) income, generally, includes income from sales, services and oil-related activities; foreign personal holding company (FPHC) income primarily includes passive income.

Appendix B. Overview of variables

Variable		Definition	Data source
TDAR	Total debt-to-asset ratio	Total debt-to-asset ratio of an affiliate, where the total debt is the sum of current and non-current liabilities.	Amadeus data base
Affiliate's CIT	Statutory CIT	Statutory corporate income tax rate of the country where an affiliate is located.	IBFD (1991-2015), OECD (2014), and KPMG (2015)
	Effective CIT	Effective corporate income tax rate of an affiliate, computed as a ratio of tax paid by an affiliate to earnings before tax.	Amadeus data base
MNC dummy	MNC dummy	Dummy variable with value of 1 if an affiliate is part of an MNC, and 0 if it is a purely domestic company. In our data set domestic companies are represented by companies whose all affiliates are located in the same country as the parent company.	Orbis data base
CFC dummy	CFC rules	Dummy variable with value of 1 if the country of an affiliate's parent had CFC rules in a particular year, and 0 if not.	IBFD (1991-2015), Deloitte (2014), Bräutigam et al. (2015), Rohatgi (2007)
CFC STRICT		Strictness measure of CFC rules in the parent country, computed as a ratio of low tax CIT rate threshold set in CFC regime to the statutory CIT rate of the respective country. The measure of the strictness can take values from 0 to 1 only, where 1 indicates the strictest CFC rules.	
SH dummy	Thin-capitalization (safe-harbour) rules	Dummy variable with value of 1 if the affiliate's country had thin-capitalization rules in a particular year and if the threshold of thin-capitalization rules is defined in terms of a safe-harbour debt-to-equity ratio, and 0 otherwise.	IBFD (1991-2015)
SH TIGHT TOTAL		Indicator of tightness of thin-capitalization rules in an affiliate's country, computed as: $\frac{1}{(1+\mu^{tot})}$, where μ^{tot} is the safe-harbour threshold of thin-capitalization rules that is expressed as total debt-to-equity ratio.	
SH TIGHT RELATED		Indicator of tightness of thin-capitalization rules in an affiliate's country, computed as: $\frac{1}{(1+\mu^{tot})}$, where μ^{tot} is the safe-harbour threshold of thin-capitalization rules that is expressed as related debt-to-equity ratio.	

Appendix B (continued)

Variable		Definition	Data source
ES dummy	Thin-capitalization (earnings stripping) rules	Dummy variable with value of 1 if the affiliate's country had thin-capitalization rules in a particular year and if the threshold of thin-capitalization rules is defined as the maximum amount of interest that can be deducted relative to EBITDA, and 0 otherwise.	IBFD (1991-2015)
ES TIGHT		Indicator of tightness of thin-capitalization rules in an affiliate's country, computed as 1 minus the threshold of thin-capitalization rules that is expressed as a maximum share of the EBITDA that can be deducted as an interest expense. It can take values from 0 to 1.	
TP dummy	Transfer pricing rules	Dummy variable with value of 1 if the affiliate's country of residence had transfer pricing rules in a particular year, and 0 otherwise.	Lohse and Riedel (2013), Deloitte (2015b), EY (2013), and IBFD (1991-2015)
TP STRICT		Strictness measure of transfer pricing documentation requirements, it can take value 0, 0.5, or 1, where 1 indicates the strictest requirements.	
Log of sales	Firm-level control variables	Variable describing firm size, computed as the logarithm of an affiliate's sales.	Amadeus data base
Fixed asset ratio		Variable describing tangibility of assets, computed as the ratio of an affiliate's fixed assets to total assets.	Amadeus data base
Profitability		Variable describing profitability, computed as a ratio of an affiliate's earnings before interest, tax, depreciation, and amortization to total assets.	Amadeus data base
Loss carry-forward		Dummy variable equal to 1 if an affiliate has carry-forward losses in a particular year, and 0 otherwise.	Amadeus data base
Inflation	Country-level control variables	Variable indicating the annual percentage change in the consumer price index of an affiliate's country of residence.	World Bank (2016a)
Log of Corruption index		Variable defined as the logarithm of annual corruption index of an affiliate's country of residence.	World Bank (2016b)
Growth opportunities		Variable serving as a proxy for growth opportunities of an affiliate, computed as the median annual sales growth per industry for each country.	Amadeus data base
Log of Creditor rights index		Variable defined as the logarithm of annual strength of legal rights index of an affiliate's country of residence.	World Bank (2016c)

Appendix C. Statutory CIT rates, % (2004-2015)

The table presents statutory CIT rates of European countries, the US and Canada (2004-2015). The information is obtained from IBFD (1991-2015), OECD (2014), and KPMG (2015). For countries that have both central and sub-central statutory corporate income tax rates, we report the combined corporate income tax rate.

Country/Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Albania	23	23	20	20	10	10	10	10	10	10	15	15
Andorra	5	5	5	5	5	5	5	5	5	10	10	10
Austria	34	25	25	25	25	25	25	25	25	25	25	25
Belarus	24	24	24	24	24	24	24	24	18	18	18	18
Belgium	34	34	34	34	34	34	34	34	34	34	34	34
Bosnia and Herzegovina	30	30	10	10	10	10	10	10	10	10	10	10
Bulgaria	20	15	15	10	10	10	10	10	10	10	10	10
Canada	34	34	34	34	31	31	29	28	26	26	26	26
Croatia	20	20	20	20	20	20	20	20	20	20	20	20
Cyprus	15	10	10	10	10	10	10	10	10	13	13	13
Czech Republic	28	26	24	24	21	20	19	19	19	19	19	19
Denmark	30	28	28	25	25	25	25	25	25	25	25	24
Estonia	26	24	23	22	21	21	21	21	21	21	21	20
Finland	29	26	26	26	26	26	26	26	25	25	20	20
France	35	35	34	34	34	34	34	34	34	34	34	34
Germany	39	39	39	39	30	30	30	30	30	30	30	30
Gibraltar	35	35	35	33	33	27	22	10	10	10	10	10
Greece	35	32	29	25	25	25	24	20	20	26	26	26
Hungary	16	16	17	20	20	20	19	19	19	19	19	19
Iceland	18	18	18	18	15	15	18	20	20	20	20	20
Ireland	13	13	13	13	13	13	13	13	13	13	13	13
Italy	33	33	33	33	28	28	28	28	28	28	28	28
Kosovo	20	20	20	20	20	10	10	10	10	10	10	10
Latvia	15	15	15	15	15	15	15	15	15	15	15	15
Liechtenstein	15	15	15	15	15	15	15	13	13	13	13	13
Lithuania	15	15	15	15	15	20	15	15	15	15	15	15
Luxembourg	30	30	30	30	30	29	29	29	29	29	29	29
Macedonia	15	15	15	12	10	10	10	10	10	10	10	10
Malta	35	35	35	35	35	35	35	35	35	35	35	35
Moldova	20	18	15	15	0	0	0	0	12	12	12	12
Monaco	33	33	33	33	33	33	33	33	33	33	33	33
Montenegro	20	9	9	9	9	9	9	9	9	9	9	9
Netherlands	35	32	30	26	26	26	26	25	25	25	25	25
Norway	28	28	28	28	28	28	28	28	28	28	27	27
Poland	19	19	19	19	19	19	19	19	19	19	19	19
Portugal	28	28	28	27	27	27	27	27	32	32	32	30
Romania	25	16	16	16	16	16	16	16	16	16	16	16
Russia	24	24	24	24	24	20	20	20	20	20	20	20
San Marino	17	17	17	17	17	17	17	17	17	17	17	17
Serbia	12	10	10	10	10	10	10	10	10	15	15	15
Slovakia	19	19	19	19	19	19	19	19	19	23	22	22
Slovenia	25	25	25	23	22	21	20	20	20	17	17	17
Spain	35	35	35	33	30	30	30	30	30	30	30	28
Sweden	28	28	28	28	28	26	26	26	26	22	22	22
Switzerland	24	21	21	21	21	21	21	21	21	21	21	21
Turkey	33	30	20	20	20	20	20	20	20	20	20	20
Ukraine	30	25	25	25	25	25	25	23	21	19	18	18
United Kingdom	30	30	30	30	28	28	28	26	24	23	21	20
United States	39	39	39	39	39	39	39	39	39	39	39	39

Appendix D. Coded values of CFC STRICT (2004-2015)

CFC STRICT is the measure of the strictness of CFC rules in the parent country. CFC STRICT is computed as a ratio of low tax CIT rate threshold set in CFC regime to the statutory CIT rate of the respective country. The measure of the strictness can take values from 0 to 1 only, where 1 indicates the strictest CFC rules. See table 1 for low tax CIT rate thresholds and Appendix C for statutory CIT rates.

Country/ Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Canada	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Denmark	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Finland	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
France	0.67	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Germany	0.64	0.64	0.64	0.64	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Greece	-	-	-	-	-	-	-	-	-	-	0.50	0.50
Hungary	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.53	0.53	0.53	0.53	0.53
Iceland	-	-	-	-	-	-	0.67	0.67	0.67	0.67	0.67	0.67
Italy	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Lithuania	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Norway	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Poland	-	-	-	-	-	-	-	-	-	-	-	0.75
Portugal	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Russia	-	-	-	-	-	-	-	-	-	-	-	0.75
Spain	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Sweden	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Turkey	-	-	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
United Kingdom	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
United States	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90

Appendix E. Coded values of SH TIGHT and ES TIGHT (2004-2015)

SH TIGHT and ES TIGHT are indicators of tightness of thin-capitalization rules. For detailed explanation on how these variables are calculated, see section 3.1. See table 3 for the input data.

Country	Year	Safe-harbour (SH) rules			Earnings stripping (ES) rules	
		SH dummy	SH TIGHT total	SH TIGHT related	ES dummy	ES TIGHT
Albania	2005-2015	1	0.20	0	0	0
	2004	1	0	0.20	0	0
Belgium	2012-2015	1	0	0.17	0	0
	2004-2011	1	0.13	0	0	0
Bulgaria	2007-2015	1	0.25	0	1	0.25
	2004-2006	1	0.33	0	1	0.25
Belarus	2013-2015	1	0.25	0	0	0
Croatia	2005-2015	1	0	0.20	0	0
Czech Republic	2009-2015	1	0	0.20	0	0
	2008	1	0	0.33	0	0
	2004-2007	1	0	0.20	0	0
Denmark	2007-2015	1	0.20	0	1	0.20
	2004-2006	1	0.20	0	0	0
Finland	2014-2015	0	0	0	1	0.75
	2013	0	0	0	1	0.70
France	2007-2015	1	0	0.4	1	0.75
	2004-2006	1	0	0.4	0	0.00
Germany	2008-2015	0	0	0	1	0.70
	2004-2007	1	0	0.40	0	0
Greece	2015	0	0	0	1	0.50
	2014	0	0	0	1	0.40
	2010-2013	1	0	0.25	0	0
Hungary	2004-2015	1	0.25	0	0	0
Italy	2008-2015	0	0	0	1	0.70
	2005-2007	1	0	0.20	0	0
	2004	1	0	0.17	0	0
Latvia	2004-2015	1	0.20	0	0	0
Lithuania	2004-2015	1	0.20	0	0	0
Luxembourg	2004-2015	1	0	0.15	0	0
Macedonia	2009-2015	1	0	0.25	0	0
Monaco	2004-2015	1	0	0.67	0	0
Netherlands	2004-2012	1	0.25	0	0	0

Appendix E (continued)

Country	Year	Safe-harbour (SH) rules			Earnings stripping (ES) rules	
		SH dummy	SH TIGHT total	SH TIGHT related	ES dummy	ES TIGHT
Poland	2015	1	0.5	0	0	0
	2004-2014	1	0.25	0	0	0
Portugal	2015	0	0	0	1	0.50
	2014	0	0	0	1	0.40
	2013	0	0	0	1	0.30
	2004-2012	1	0	0.33	0	0
Romania	2005-2015	1	0.25	0	0	0
	2004	1	0.50	0	0	0
Russia	2004-2015	1	0	0.25	0	0
Serbia	2004-2015	1	0	0.20	0	0
Slovak Republic	2015	0	0	0	1	0.75
Slovenia	2012-2015	1	0	0.20	0	0
	2011	1	0	0.17	0	0
	2008-2010	1	0	0.14	0	0
	2006-2007	1	0	0.11	0	0
Spain	2012-2015	0	0	0	1	0.70
	2004-2011	1	0	0.25	0	0
Switzerland	2004-2015	1	0.14	0	0	0
Turkey	2006-2015	1	0	0.25	0	0
United Kingdom	2004-2015	1	0.50	0	0	0

Appendix F. Descriptive statistics of control variables

This table provides summary descriptive statistics of firm-level and country-level control variables. See Appendix B for data sources of each variable. The descriptive statistics have been calculated from our final data set in STATA.

	Variable	Mean	Std. Err.	[95% Conf. Interval]	
Firm-level control variables	Log of sales	15.91	0.0019	15.91	15.92
	Fixed asset ratio	0.34	0.0003	0.34	0.34
	Profitability	0.11	0.0002	0.11	0.12
	Loss carry-forward	0.20	0.0004	0.20	0.21
Country-level control variables	Inflation	1.75	0.0017	1.75	1.75
	Log of Corruption index	1.91	0.0002	1.91	1.91
	Growth opportunities	0.03	0.0002	0.03	0.03
	Log of Creditor rights index	1.51	0.0004	1.51	1.51

Appendix G. Descriptive statistics of total debt-to-asset ratio

This table provides summary descriptive statistics of total debt-to-asset ratio (TDAR) variable. See Appendix C for data sources of statutory CIT rates. The descriptive statistics of TDAR have been calculated from our final data set in STATA.

Country	MNC	Domestic	Total	Average CIT rate, % (2004-2015)
Austria	0.58	0.67	0.62	26
Belgium	0.59	0.65	0.61	34
Bosnia and Herzegovina	0.54	0.54	0.53	13
Bulgaria	0.51	0.52	0.51	12
Croatia	0.6	0.58	0.6	20
Czech Republic	0.5	0.5	0.51	21
Denmark	0.49	0.46	0.5	26
Estonia	0.46	0.48	0.46	22
Finland	0.58	0.62	0.59	25
France	0.63	0.65	0.64	34
Germany	0.65	0.66	0.65	33
Greece	0.64	0.64	0.63	26
Hungary	0.57	0.6	0.58	19
Iceland	0.54	0.57	0.54	18
Ireland	0.56	0.63	0.58	13
Italy	0.68	0.72	0.69	30
Latvia	0.6	0.65	0.62	15
Luxembourg	0.53	0.56	0.54	29
Malta	0.78	0.79	0.76	35
Montenegro	0.28	0.49	0.31	10
Netherlands	0.55	0.62	0.57	27
Norway	0.65	0.69	0.68	28
Poland	0.53	0.51	0.53	19
Portugal	0.6	0.63	0.61	29
Romania	0.56	0.55	0.56	17
Russia	0.61	0.59	0.6	22
Slovakia	0.58	0.58	0.58	20
Slovenia	0.56	0.6	0.57	21
Spain	0.59	0.6	0.59	31
Sweden	0.63	0.67	0.65	26
Switzerland	0.53	0.53	0.53	21
Ukraine	0.46	0.5	0.46	23
United Kingdom	0.53	0.58	0.55	27

Appendix H. Coded values of TP STRICT (2004-2015)

TP STRICT is an indicator of tightness of transfer pricing rules. We follow the coding system by Lohse and Riedel (2013). For detailed explanation on how the variable is calculated, see section 6.1. TP STRICT can take value 0, 0.5, or 1, where 1 indicates the strictest transfer pricing documentation requirements.

Country	Year	TP dummy	TP STRICT
Austria	2004-2015	1	0.5
Belgium	2004-2015	1	0.5
Bulgaria	2009-2015	1	0.5
	2004-2006	0	0
Croatia	2009-2015	1	1
	2004-2008	0	0
Czech Republic	2004-2015	1	0.5
Denmark	2004-2015	1	1
Estonia	2007-2015	1	1
Finland	2007-2015	1	1
	2004-2006	1	0.5
France	2010-2015	1	1
	2004-2009	1	0.5
Germany	2004-2015	1	1
Hungary	2004-2015	1	1
Ireland	2010-2015	1	1
	2004-2009	0	0
Italy	2010-2015	1	1
	2004-2009	1	0.5
Latvia	2013-2015	1	1
	2007-2012	1	0.5
Luxembourg	2005-2015	1	0.5
Netherlands	2004-2015	1	1
Norway	2008-2015	1	1
	2004-2007	1	0.5
Poland	2004-2015	1	1
Portugal	2004-2015	1	1
Romania	2007-2015	1	1
	2004-2006	1	0.5
Slovak Republic	2009-2015	1	1
	2005-2008	1	0.5
Spain	2007-2015	1	1
	2004-2006	1	0.5
Sweden	2007-2015	1	1
	2004-2006	1	0.5
Switzerland	2004-2015	1	0.5
Ukraine	2015	1	1
	2013-2014	1	0.5
	2004-2012	0	0
United Kingdom	2004-2015	1	1