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Regulating International Debt Shifting: A Comparison of New Norwegian Regulation with Traditional Thin-Capitalization Rules

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Abstract

Tax planning behavior, where debt is used to minimize the tax payments, has received considerable attention in Norway recently. To limit such tax planning behavior, several of Norway's largest trading partners have implemented rules to prevent thin-capitalization. This theoretical thesis presents the general design of the new Norwegian earnings-stripping rules as well as the main features of traditional thin-capitalization rules.

The predictions from the theoretical modeling show that the new earnings-stripping rules may restrict excessive use of debt. However, the legal and theoretical review also suggests that the rules contain weaknesses that hamper the effectiveness. The weaknesses are primarily that companies can make structural changes to avoid that interest expenses will be denied deductibility. These structural adaptations involve splitting up assets, substitution between internal and external debt, and creating organizational structure that makes it possible to have a higher debt ratio. Briefly reviewing empirical papers provides evidence that the shortcomings found during the theoretical analysis may limit the effectiveness of the new Norwegian rules.

Keywords: Earnings-stripping rules, Thin-capitalization rules, Capital structure, Internal debt, External debt, Multinationals

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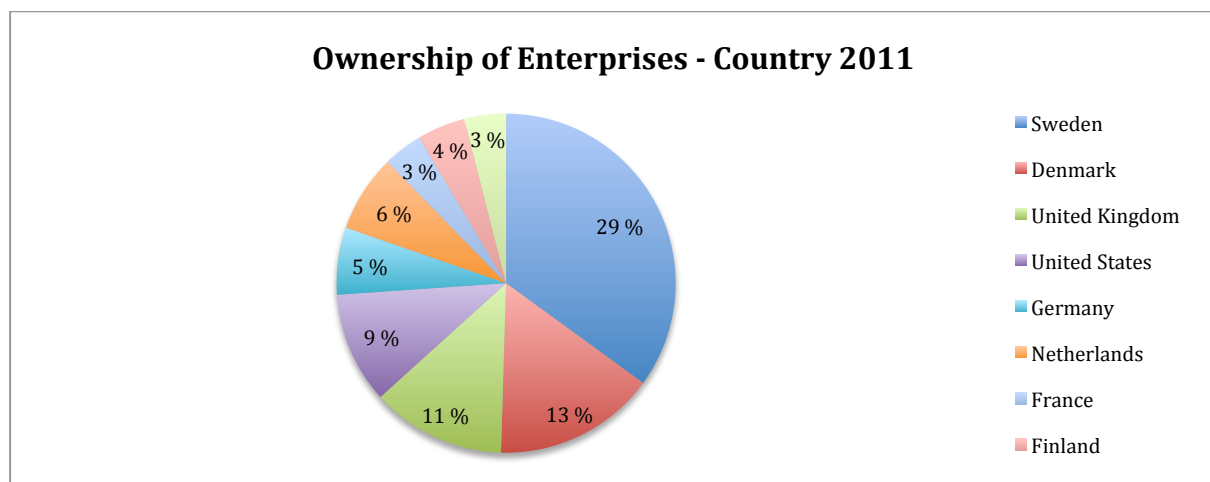Christian Smith-Nilsen

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1. Introduction

Multinational companies have had a growing impact in line with the globalization of the world economy. These enterprises have gained greater importance in each country they operate in and are in strong competition with domestic firms. In 2011, it was 6.034 enterprises controlled from abroad[1] registered in Norway. The number of employed persons was 299.924, which accounts for over 20 percent of employment for all firms in Norway. (SSB 2013) The most important countries in ownerships of foreign-controlled enterprises in Norway are typically members of OECD and countries with close geographical affiliation, as shown in Figure 1-1.

Ownership of Enterprises - Country 2011

- Sweden 29 %
- Denmark 13 %
- United Kingdom 11 %
- United States 9 %
- Germany 5 %
- Netherlands 6 %
- France 3 %
- Finland 4 %
- 3 %

Figure 1-1: *Percentage distribution of foreign-controlled enterprises by ownership 2011*
Source: Own illustration based on SSB (2013). See Exhibit 1, page 67

The increasing presence of multinationals has its challenges. For multinational corporations, it can be possible to exploit tax differences between countries. To exploit these differences, firms can use common strategies, like debt shifting and transfer pricing, in order to minimize their tax burden. Debt shifting involves stripping earnings in high tax jurisdictions via intercompany debt financing, while transfer pricing means that prices on intragroup transactions are not necessarily "arm's length", but typically motivated for tax purposes.

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[1] SSB definition: An enterprise is controlled from abroad when an enterprise or other economic entity abroad owns more than 50 percent of the domestic entity (directly or indirectly).

Since multinational companies can strategically adjust to tax differences, many OECD countries have introduced limits on deductions of interest. (Finansdepartementet 2013a, 103) In addition, the corporate tax rate in Norway has been constant since 1992, when the development from Norway's closest neighbors is a steady decline over the same time period.[2] Summarized, this may indicate that Norway is an attractive country to deduct interest expenses in.
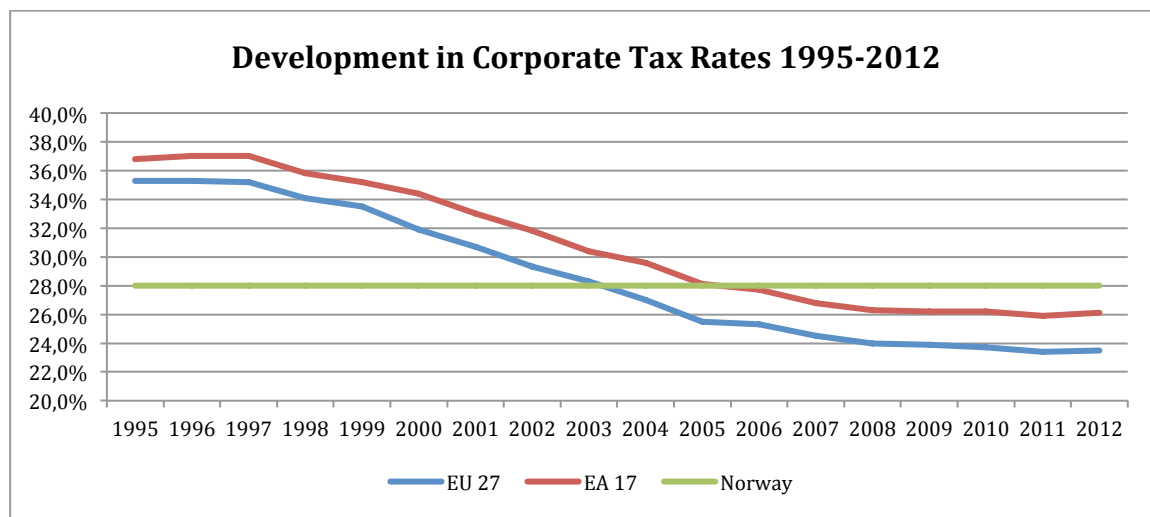
Figure 1-2: *Development in Corporate Tax Rates 1995-2012 (Eurostat 2013)*
Source: Own illustration based on Eurostat (2013). See Exhibit 2, page 68

Tax planning done by multinational enterprises may lead to a significant reduction of the tax base. At the same time, there can occur a competitive advantage for multinationals compared to domestic enterprises. The latter do not have the same strategic adjustment opportunities, which may lead to a significantly higher tax bill. These differences are not economically effective. Society as a whole will not be benefited greatly from these companies spending huge resources to exploit such tax differences between countries. From a socioeconomic standpoint, this money could be better spent elsewhere. (Finansdepartementet 2013a, 103)

Given the negative effects of thin-capitalization, countries' tax administrations can introduce rules that reduce the flexibility of multinationals (e.g. limiting the amount of interest expenses that can be deducted), which leads to the overall issue of this thesis:

[2] At the same time as the newly proposed rules on interest deduction were adopted by the Norwegian Parliament (13.12.2013), the corporate income tax rate was reduced from 28% to 27%. These rules are effective from 1 January 2014.

"Will the new Norwegian earnings-stripping rule prevent debt shifting more efficiently than traditional thin-capitalization rules, which restrict the companies debt to asset ratio?"

This overall issue will be examined from a theoretical perspective and will, because of the scope of this thesis, only focus on debt shifting. Chapter 2 will contain a short introduction to thin-capitalization rules. In Chapter 3, Arm's length principle, which mainland Norway has relied exclusively upon, will be discussed shortly to include debt regulation in Norway in historical perspective. Furthermore, the new Norwegian rules, which are effective from 01.01.2014, will be elaborated. In Chapter 4, a theoretical analysis will be conducted. The theoretical framework is based on a model that looks at firms' choices of capital structure. (Schindler and Schjelderup 2012; Moen et al. 2011) This model is expanded to contain the new Norwegian rules discussed in Chapter 3. Finally, Chapter 5 will conduct an empirical review of relevant literature on thin-capitalization rules and tentatively associate the findings to the new Norwegian rules.

2. Thin-Capitalization Rules

It has been well documented that multinational firms have incentives to increase their internal and external debt in attempt to reduce their tax base.[3] Reduction of affiliates' tax burden can be achieved by increasing its debt-to-asset ratio, or being "thin capitalized". This is typically profitable since debt financing is tax-favored.

In order to prevent affiliates from being thin-capitalized, rules against thin-capitalization can be introduced. Thin-capitalization rules differ from country to country, but a general characteristic is that the tax exemption on interest income is denied of interest on any debt exceeding a certain threshold. (Buettner et al. 2012, 930)

Thin-capitalization rules can be divided into two different approaches: specific and non-specific. (Dourado and De la Feria 2008, Section II.1) The specific rules implies that tax authorities set restrictions on internal debt, while they do not distinguish between external and internal debt with non-specific rules. The latter is often referred to as earnings-stripping rules. Norway introduced such rules 01.01.2014; these will, however, be reviewed in its entirety in section 3.4.

2.1 Specific Thin-Capitalization rules

Specific thin-capitalization rules aim to limit the deduction of interest on internal debt. Under this approach, deductibility of interest expense above a specified debt-to-asset ratio from a shareholder with controlling influence will be denied or penalized. (Buettner et al. 2012, 931) Germany is one of the countries that have practiced these kinds of rules since 1994. Their specific thin-capitalization rules were only applicable if the shareholder share in the German affiliate was ≥ 25%. The fixed debt-to-asset ratio was set to 3:1, and it was not applicable for banks. Another loophole was created for holding companies that could have a fixed debt-to-asset ratio of 9:1. It should be noted that the rules were tightened in 2001. The fixed internal debt-to-asset ratio was reduced to 1.5:1, and holding companies now had to adapt to a ratio of 3:1. (Weichenrieder and Windischbauer 2008, 2-5)

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[3] Studies shows that multinational companies can use internal and external debt to minimize their tax payments (Buettner et al. 2009; Mintz and Weichenrieder 2005; Buettner et al. 2012; Barion et al. 2010)

The fixed debt-to-asset ratio works as a safe haven or safe harbor rule. This indicates that if internal debt is within this threshold, interest expenses will not be denied deductibility, hence "safe haven" or "safe harbor". However, by definition, the firm can have as much external debt without violating the internal fixed debt-to-asset ratio.

Thin-capitalization regulation, with fixed debt-to-asset ratio, is widespread. Buettner et al. (2012) provides an overview of thin-capitalization rules in 2005 in "Table 1". This overview includes countries from Europe and OCED. Dourado and De la Feria (2008, 16) provides a similar overview of countries' approaches to thin-capitalization regulation. It follows from these overviews that the fixed debt-to-asset ratios vary across countries, but the main features are quite similar.

Specific thin-capitalization rules intend to reduce international debt shifting. Ruf and Schindler (2012, 6) argues that the motivation behind these rules are obvious, since the internal debt can be seen as tax favorable equity, and specific thin-capitalization rules induce direct restrictions on deductibility of this kind of debt. However, the effectiveness of these policies is important. Less effective rules, which contains several loopholes (e.g. Holding preference under German thin-capitalization rules), will have less impact on the multinational companies' capital structure. This issue will be discussed in more detail in the theoretical analysis later in the thesis.

2.2 Non-specific Thin-Capitalization Rules

Non-specific thin-capitalization rules also aim to limit deductibility of interest expenses. Non-specific rules will also take into account the external debt, unlike the specific rules. By doing so, these rules attempt to prevent any kind of debt shifting and encourage to more equity financing. Non-specific thin-capitalization rules also go by the name "earnings-stripping rules", which they hereafter will be referred as.

Germany is one of the countries that have implemented earnings-stripping rules. Effective from 01.01.2008, they introduced restriction on both internal and external debt. The new rules sets a threshold of net interest expenses that can be deducted from tax base until 30% of EBITDA. (Dourado and De la Feria 2008, 3) These rules also have some exceptions. They will not be applicable if the affiliates debt-to-asset ratio is equal or less than the leverage of

the group as a whole (escape clause). In addition, the rules will not be applicable if the firm is not a member/part of a corporate group/trust. A tax threshold of 3 million euro also exists before the rules apply. These exceptions are intended to ensure that pure domestic firms (and small-medium sized firms) will not be affected by the rules. (Ruf and Schindler 2012, 13-14)

The German example of earnings-stripping rules has a direct approach to external debt. Such rules may, however, be designed so that external debt has an impact, but will not subject to interception. The Norwegian earnings-stripping rules are characterized in this way, which will be elaborated in section 3.4 and 4.4.

3. Legal framwork

In this section, the legal framework for the theoretical modeling will be reviewed. First, this section will discuss the arm's length principle, which Norway has relied exclusively upon. Secondly, there will be a brief discussion on the deductibility of expenses associated with tax planning. Finally, the implications and specifications of the new Norwegian thin-capitalization regulation, effective from 2014, will carefully be examined.

3.1 Interest deductability in Norway

The Norwegian Tax Act (Finansdepartementet 1999) regulates the tax liability of physical and legal persons in Norway. According to Section 6-40, first paragraph, one may deduct interest expenses of the taxpayer's debt. This represents the main rule of interest deductibility in Norway. However, rules exist that can open for interception of the interest deductibility, especially on debt for thin-capitalized subsidiary present in Norway.

3.2 Arm's length principle

The arm's length principle is a good established and recognized principle internationally. This principle is formally described in The Norwegian Tax Act (NTA) Section 13-1. This fundamental principle makes it possible to conduct a discretionary assessment of fiscal transfers between related parties. (Finansdepartementet 2013a, 105) In this section, the main focus will be on the capital structure question with regards to the arm's length principle.

The capital structure question addresses the issue of whether a subsidiary has achieved a high debt ratio and consequently has exceeded its borrowing capacity. (Skaar 2006, 459) Does the related company have a higher leverage than it would have been able to obtain from independent sources? If this is the case, it has, by definition, excessive debt in relation to its arm's length borrowing capacity, leading to the possibility of excessive interest deductions.

In order to prevent thin-capitalization, the tax authorities have the opportunity to conduct a discretionary assessment of the transaction. NTA Section 13-1, subsection 1, opens for this discretionary assessment:

> *"The discretionary assessment may be made if the taxpayer's wealth or income is reduced through direct or indirect interest jointly with another individual, company or entity."[4]*

It follows by this section that there are three cumulative criteria[5] that need to be met before the tax authorities have the opportunity of conducting a discretionary assessment:

Criteria 1   Taxpayer's wealth or income is reduced

Criteria 2   Joint interest

Criteria 3   The joint interest has caused an asset or income reduction

The objective behind this provision is that transactions between related parties should be treated, for tax purposes, the same as transactions between unrelated parties. However, this provision does not induce tax liability for the company, but it allows the tax authorities to make discretionary assessments in a way that represents a real transaction. This coincides with Ruf and Schindler (2012, 16-17) which argues that the principle is a "case-to-case assessment" that investigates if the terms could have been obtained if the transactions were between unrelated parties. The principle will therefore imply that related parties, e.g. subsidiaries in a multinational company, shall, for tax purposes, be regarded as independent, and the transaction should reflect this. (Skaar 2006, 327)

In order to understand how the tax authorities can conduct a discretionary assessment, it will be useful to take a closer look at the criteria that NTA Section 13-1, subsection 1, mentions[6]:

Criteria 1 says that there has to be an economic transaction that reduced the taxpayer's

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[4] NTA Section 13-1, subsection 1, is freely translated by me. Norwegian text: "Det kan foretas fastsettelse ved skjønn hvis skatteyters formue eller inntekt er redusert på grunn av direkte elle rindirekte interessefellesskap med en annen person, selskap eller innretning."

[5] Cumulative criteria should be understood as that all conditions/criteria must be met before the transaction can subject to discretionary assessment

[6] The review criteria are greatly simplified. There are several legal issues that can be considered beyond what is reviewed here. However, this is outside the scope of this thesis. The preparatory work, Ot.prp nr 62 (Finansdepartementet 2007) and Skaar (2006) can provide a fuller review of these legal issues.

wealth or income. This discretionary assessment needs to be considered with respect to how the transaction would have been if it were between unrelated parties. With regards to thin-capitalization, the equity ratio could be subject to assessment if it is below "the minimum arm's length equity ratio." (Skaar 2006, 505) The tax authorities can examine this by comparing the transaction with a comparable transaction between unrelated parties. As described in Ot.prp nr 62 (Finansdepartementet 2007), a comparability analysis can be conducted to examine if the transaction would have achieved the same terms if it was between unrelated parties.[7] If the comparability analysis shows that the capital structure has a equity ratio that is lower than the arm's length capital structure allows, the criteria is fulfilled.

Criteria 2 says that a joint interest between the parties should exist. Ownership is a typical example of a relationship that creates a common interest. This is especially relevant for subsidiaries within a multinational company and loan agreements between them. In these cases, debtor and creditor, have a common interest (due to the ownership). (Skaar 2006, 493) This can be shown graphically, assuming the parent is the creditor and the subsidiary is the debtor:
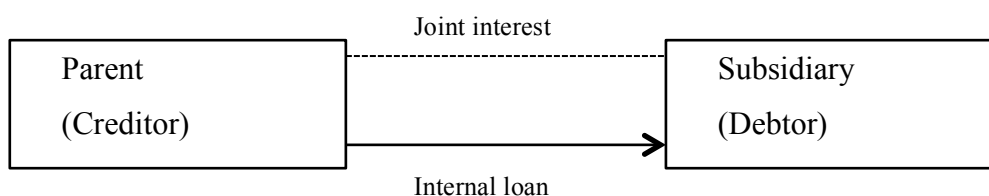
Figure 3-1: *Joint interest, internal loan*
Source: Own illustration

On the other hand, the subsidiary can grant a loan with the parent as guarantor, which can further lead to criteria to be fulfilled. (Skaar 2006, 494) This can also be shown graphically, assuming the parent is guarantor, subsidiary is debtor, and an unrelated party is creditor.

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[7] The preparatory work, Ot.prp nr 62, provides a comprehensive review on the criteria that must be set to enable transactions to be comparable. (Finansdepartementet 2007)
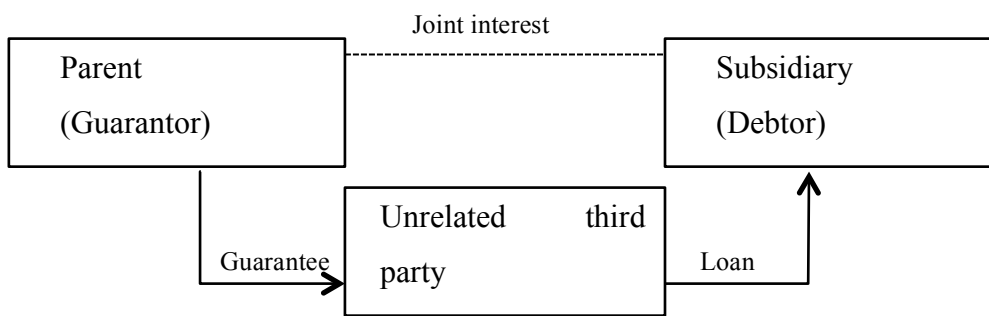
Figure 3-2: *Joint interest, internal loan*
Source: Own illustration

The examples that have been discussed above show that it is possible to achieve a high debt ratio as a result of the parent company's creditworthiness and joint interests. If this is the case, the criteria is fulfilled.

Criteria 3 is the last of the three cumulative criteria. It says that it must be the joint interest that has caused the wealth or income reduction. This sets additional requirements on the comparability analysis that was mentioned earlier. (Skaar 2006, 360) If it can be proven that the reduction of income, e.g. due to agreement to exceed loan capacity, which translates in higher interest expenses, the criteria will be fulfilled.

When the three cumulative criteria have been fulfilled, NTA Section 13.1, subsection 1 and 3, give the tax authorities permission to conduct a discretionary assessment.

> *Subsection 1: "The discretionary assessment may be made[...]"[8]*

> *Subsection 3: "Income and wealth should be estimated as if there was no joint interest"[9]*

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[8] NTA Section 13.1, subsection 1, is freely translated by me. Norwegian text: "Det kan foretas fastsettelse av skjønn […]"
[9] NTA Section 13.1, subsection 3, is freely translated by me. Norwegian text: "Ved skjønnet skal formue eller inntekt fastsettes som om interessefellesskap ikke hadde foreligget."

It is further specified in NTA Section 13.1, subsection 4, that tax authorities should take OECD guidelines into account when exercise of discretion is made. This section has been incorporated in the Act to "clarify and reinforce the OECD guidelines status in Norwegian law." (Finansdepartementet 2007) Overall, the provision leads to a thorough review of how to decide whether the tax authorities may conduct a discretionary adjustment of the taxpayer.

The principle is based on a couple of strong assumptions in order to function well. As Ruf and Schindler (2012, 17) points out, the arm's length principle is optimal in a world with perfect information. The main reason is that this approach will address each case individually and ensure justice. However, since the real world is more nuanced, one has to take into consideration that imperfections exist. Strong assumptions, like no administrative costs and limited, asymmetric information, will not hold in the real world. Tax authorities and firms also have different access to information, since firms often have private information about their internal transactions. The administrative costs for tax authorities can consequently be extremely high if they are trying to reveal illegal capital structure with a thin information base. The burden of proof can also be seen from the firm's side. If they, at any time, need to document that their capital structure is in accordance to the arm's length principle, this can cause high administrative costs for the firm.

Ruf and Shindler (2012, 17) argues that arm's length principle is not a proper alternative to thin-capitalizations rules. As the discussion above mentioned, arm's length principle may result in an administrative burden for both parties (tax authorities and firms). The limited information that tax authorities have access to may increase the difficulty to test whether capital structure is within arm's length capital structure. This is part of the reason why Norway has introduced more specific restrictions on the deduction of interest between related parties.

3.3 Deductibility of expenses associated with tax planning

Deductibility of costs is stated in NTA Section 6.1, which represent the main rule of deductibility:

Subsection 1: "Costs are deductible if they incurred to acquire, maintain or secure taxable income [...]"[10]

In order to find further guidance that supplements this general deduction rule, referral may be made to "Lignings-ABC" (2014), which is prepared by the Directorate of Taxes in Norway (Skattedirektoratet). This is a handbook that has the intention to provide guidance on how to deal with the different rules. The Directorate of Taxes provides its own interpretations of the existing legal sources. However, in some cases there may be some uncertainty about how to interpret or adapt, which means that this source must be used with care.

Deductibility of expenses associated with tax planning is specified in Section 3.10.1 (Skattedirektoratet 2014, 775):

"Costs of pure tax planning are not tax deductible."[11]

This question is very comprehensive, and the assessment subject depends a lot on the term "tax planning". Large multinational corporations have to make assessments of the tax consequences that various actions can cause. This applies to organization of activities beyond national boundary where this is absolutely necessary. A consequence of poor planning can result in such double taxation. However, it can be tempting to extend tax planning for reasons that will deny access for a deduction.

The question of how to treat these costs are relevant when trying to develop the theoretical model based on the new Norwegian rules. Schindler and Schjelderup (2012, 639) assume that cost related to the debt-to-asset ratio are tax deductible. This is in contrast to the approach used by Moen et. al (2011, 7), which assumes that these costs are not deductible. This is, however, a strong assumption, since this would implicate that costs related to the debt-to-asset ratio will not appear on the income statement for corporate taxation. Due to simplification considerations, this thesis will not go further into the question of whether

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[10] NTA Section 6.1, subsection 1, is freely translated by me. Norwegian text: "Det gis fradrag for kostnad som er pådratt for å erverve, vedlikeholde eller sikre skattepliktig inntekt[…]"
[11] Lignings-ABC, Section 3.10.1, is freely translated by me. Norwegian text: "Kostnader til ren skatteplanlegging er ikke fradragsberettiget."

assessment of costs associated with tax planning is deductible or not. However, it will be assumed that these are not deductible, in accordance with Moen et. al (2011, 7).

3.4 Norwegian Earnings-stripping rules

New rules for interest deduction between related parties have been enacted for the fiscal year 2014 in Norway. Tax authorities' motivation is to reduce the tax advantage of multinational firms and maintain the tax base for Norway. As pointed out in Prop.1 LS (Finansdepartementet 2013a) and Prop.1 LS Tillegg 1 (Finansdepartementet 2013b), most of the countries in OECD have already introduced their own rules, which reduces the opportunity to deduct interest expenses. Buettner et al. (2012, 932) also provides a list of countries that have different thin-capitalization rules in 2005. The new rules that will apply for Norway, are incorporated in NTA as Section 6.41. The following will give a brief review of the new rules.[12]

It follows of NTA section 6.41, subsection 3:

> *"If net interest expense exceeds five million kroner, it can not be deducted for the amount that exceeds 30 percent of ordinary income or unmet deficit before limitation of deduction under this section, plus interest expenses and tax deprecation, and reduced by interest income. Interception of interest deductibility under the preceding sentence is made only for an amount up to the size of the net interest expense on liabilities to related person, company or entity. [...]"[13]*

The new rules imply that net interest expenses above 30% of a determined result size will be denied deductibility. However, it is specified that interception of interest deductibility will be made only for the interest expenses on liabilities to the related person, company or entity. The calculations will be based on ordinary income and unmet deficit from previous years.

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[12] The review of the Norwegian Earnings-stripping rules is simplified, as in the discussion of arm's length principle. There are several legal issues that can be considered beyond what is reviewed here. However, this is outside the scope of this thesis. A more comprehensive review of the rule set can be viewed Prop.1 LS (Finansdepartementet 2013a) and Prop.1 LS Tillegg 1 (Finansdepartementet 2013b)

[13] NTA Section 6.41, subsection 3, is freely translated by me. Norwegian text: "Dersom netto rentekostnader overstiger 5 millioner kroner, kan de ikke fradras for den delen som overstiger 30 prosent av alminnelig inntekt eller årets udekkede underskudd før begrensning av fradrag etter denne paragraf, tillagt rentekostnader og skattemessige avskrivninger, og redusert med renteinntekter. Avskjæring av rentefradrag etter foregående punktum foretas bare for et beløp inntil størrelsen på netto rentekostnader på gjeld til nærstående person, selskap eller innretning.[...]"

Unmet deficit from previous years will therefore reduce the possible deductions in the current year. Net interest expenses and tax deprecation shall be added to the calculation basis. This calculation is somewhat similar to the key earnings measure EBITDA, but has a tax approach (e.g. tax deprecation). For further simplification, this earning measure will be defined as $EBITDA^{TAX}$. It should be noted that the rules has an exemption limit of five million kroner.

The calculations can be exemplified first by assuming that net interest expenses only originate from related parties.

Ordinary income	200
Tax deprecation	50
Net taxable interest expenses	150
$EBITDA^{TAX}$	**400**

$EBITDA^{TAX}$ will be the basis of the calculations, or the determined result size, as mentioned above. Thirty percent of $EBITDA^{TAX}$ will reflect the maximum interest deduction.

$EBITDA^{TAX} \cdot 30\%$	120

In this case we have assumed that net taxable interest expenses originate only from related parties. The interest expenses that will be denied deductibility will therefore be:

Net taxable interest expenses	150
$30\%[EBITDA^{TAX}]$	120
Denied interest deductibility	**30**

As described in NTA Section 6.41, subsection 3, there will be only interest expenses from related parties, above the defined threshold, that will be denied deductibility. Debt from unrelated parties will therefore not be subject to interception, but can displace deductibility of internal interest expenses.

Whether the debt is classified as debt from unrelated or related parties is described in more detail in NTA Section 6.41, subsection 4 and 6. In order to consider related parties, it is

required to have a direct or indirect ownership, or control of at least 50%.[14] Latter subsection sets additional restriction on what is considered debt from non-related parties. If a related party has provided security for the debt, the debt will be considered as internal debt.[15] This situation coincides with Figure 3-2, which showed a composition in which the parent company guaranteed the subsidiary's loan. Loans with indirect guarantee, a middle way between direct loan and guarantee, can also be considered as internal. These loans are called back-to-back loans, and one variant can be where the parent provides a loan to an unrelated third party, which further provides a loan to a subsidiary of the parent firm that provided the loans initially. (Skaar 2006, 496-497) These kinds of loans typically appear to be different arrangements than they really are.
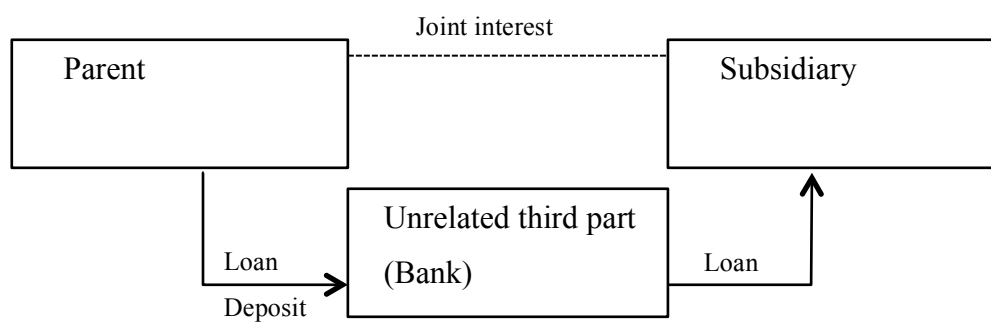
Figure 3-3: *Back-to-back arrangement*
Source: Own illustration

However, the tax authorities have proposed exemptions with regards to the assessment of security of debt. According to the final regulation document of 24 April 2014 (Finansdepartementet 2014) loans that have been provided security from underlying group companies, that own at least 50%, will not be considered internal debt. This accounts for upstream security where the subsidiary provides security for the parent company's loan.

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[14] NTA Section 6.41, subsection 4, is freely translated by me. Norwegian text: "[…] selskap eller innretning som låntakeren, direkte eller indirekte, eier eller kontrollerer med minst 50 prosent […]"
[15] NTA Section 6.41, subsection 6, is freely translated by me. Norwegian text: "Om den gjelden som ligger til grunn for rentekostnaden er opptatt hos en part som ikke er nærstående, anses gjelden likevel som opptatt hos en nærstående part så langt en nærstående part har stilt sikkerhet for gjelden […]"

By building further on the previous example, it can be shown how external and internal debt is treated. Ignoring the previous assumption that debt only originates from related parties gives the following calculations:

Ordinary income	200
Tax deprecation	50
Net taxable interest expenses	150
Whereof internal	20
Whereof external	130
EBITDA^{TAX}	**400**

30% of EBITDA^{TAX} will reflect the maximum interest deduction and will be the same amount as in the first example. The reason for this is that the only thing that has changed is the allocation between internal and external debt. The net taxable interest expenses remained the same.

$$\text{EBITDA}^{TAX} \cdot 30\% \qquad 120$$

It follows that the calculations for denied interest deductibility would also remain the same:

Net taxable interest expenses	150
30%[EBITDA^{TAX}]	120
Denied interest deductibility	30
Limited to internal debt	**20**

In this situation we see that denied interest deductibility (30) is more then the internal interests expense (20). Since it's only internal debt that will be subject to interception, the reduction of deductible interest expenses will be equal to 20. It follows from this example that it's only internal debt that is subject to interception of interest expenses. However, an increase in usage of external debt will have an effect on maximum internal deductibility. More specifically, changing external interest expense by 10, everything else equals:

ΔNet taxable interest expenses	10
Δ30%[EBITDA^{TAX}]	3[16]
ΔDenied interest deductibility	**7**

Of this calculation, we see that the denied interest deductibility on internal debt increases when external debt increases.

The discussion above reflects the main legal issues that will be relevant for the theoretical modeling. However, NTA Section 6.41, subsection 7-9, points out certain restrictions that may be appropriate to be aware of.

> *Subsection 7: "Net interest expense, which after the third paragraph are not tax deductible, can be deducted from ordinary income in the next ten years."[17]*

Of preparatory work, Prop.1 LS Tillegg 1 (Finansdepartementet 2013b, 52), it follows that if taxable income is positive, before loss carry forward, the carry forward can be used so that taxable profit reaches zero before the implementation of the deduction limitation. However, it is not permitted to carry forward loss *after* an interception of interest deductibility has been done. In addition to this restriction, there are specific firms, which are not covered by NTA Section 6.41.

> *Subsection 8: "This paragraph does not apply to financial institutions by the Financial Institutions Act § 1-3 and § 2-1[...]"[18]*

> *Subsection 9: "This paragraph does not apply to companies that are covered by the Petroleum Taxation Act § 3 d"[19]*

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[16] Increasing external interest expenses generate an increase in EBITDA^{TAX} with the same amount.

[17] NTA Section 6.41, subsection 7, is freely translated by me. Norwegian text: "Netto rentekostnader som etter tredje ledd ikke er fradragsberettiget, kan fradras i alminnelig inntekt i påfølgende ti år […]"

[18] NTA Section 6.41, subsection 8, is freely translated by me. Norwegian text: "Denne paragraf gjelder ikke for finansinstitusjoner etter finansieringsvirksomhetsloven § 1-3 og § 2-1 […]"

[19] NTA Section 6.41, subsection 9, is freely translated by me. Norwegian text: "Denne paragraf gjelder ikke for selskap som er omfattet av petroleumsskatteloven § 3 d.

Of these sections, we see that certain taxpayers are omitted form this provision. Especially the Norwegian Petroleum Sector has practiced explicit thin-capitalization rules since 1994. (Finansdepartementet 2000)

The new rules will apply for a wide range of actors. Foreign companies, which have limited tax liability in Norway, after NTA Section 2.3, will have to adapt to these rules.[20] (Finansdepartementet 2013a, 124) This is typically a branch of a foreign company in Norway. In cases like this, the authorities need to assess how to determine the difference between internal and external debt in the branch.

The foreign head office determines how much debt the Norwegian permanent establishment shall be allocated. The tax authorities need to assess how much of this debt is considered from related and unrelated parties. The final solution on this problem is that the ratio between internal and external debt in the Norwegian permanent establishment is set equal to the same ratio in the foreign resident enterprise. This means that interest expenses are divided into internal and external debt by using this ratio.[21] The Ministry of Finance admits that firms can adapt to these rules, due to tax planning reasons, by manipulating the debt around year-end or by ensuring that the foreign resident enterprise has only external debt. (Finansdepartementet 2013a) This potential loophole can be used to avoid the Norwegian earnings-stripping rules, but it should be noted that the tax authorities could prevent this by addressing the general Norwegian "piercing rule".

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[20] Foreign companies with limited tax liability in Norway are regulated in NTA Section 2.3 and The Norwegian Petroleum Act Section 1

[21] Given that the foreign resident enterprise has an average internal debt of 400 and average external debt of 600, the ratio is determined to be 2:3. The average is measured by taking the average of the debt January 1 and December 31. It follows that if the Norwegian permanent establishment has total interest expenses of 20, these will be divided into 8 (internal interest expenses) and 12 (external interest expenses) by using the internal/external ratio of foreign resident enterprise. (Finansdepartementet 2013a, 125)
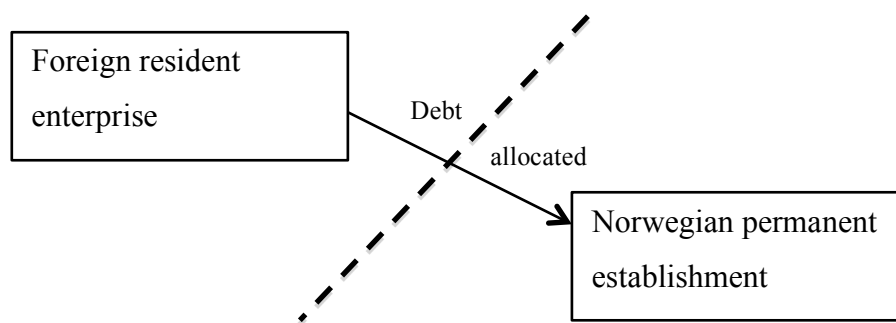
Figure 3-4: *Permanent establishment (branch)*
Source: Own illustration

3.5 Summary - Legal framework

Until 01.01.2014, mainland Norway has exclusively relied on the arm's length principle. This approach addresses each case individually and ensures justice, but the increasing administrative costs associated with this enforcement indicates that this is not a proper alternative to thin-capitalization rules.

From fiscal year 2014, new regulation regarding interest deduction will apply for mainland Norway. The rules are designed to prevent earnings-stripping through intercompany loans. The new rules imply that if net interest expenses are above 30% of a determined result size, certain interest expenses will be denied deductibility. The interception of interest deductibility will be made only for the interest expenses on liabilities to the related person, company or entity, as well as certain types of loans guaranteed or secured by a related party. From this, it follows that the external interest expenses will not be intercepted but have an indirect impact since it is included in net interest expense.

The potential loopholes in the new Norwegian rules is, however, somewhat uncertain. Foreign companies, which have limited tax liability in Norway, can adapt to these rules due to tax planning reasons. The tax authorities have announced that they can prevent this by addressing the general Norwegian "piercing rule". Since the earnings-stripping rules are new, there is not much precedent to circumvent the rules. However, it was assumed that tax experts could find potential opportunities to circumvent the rules.

4. A theoretical analysis

In this chapter, the theoretical analysis will be conducted. In section 4.1, the basis of the analysis will be carried out. In section 4.2, an extended discussion on capital structure, with emphasis on external and internal debt, will be presented. The previous sections are the foundation of the theoretical modeling of thin-capitalization rules. Section 4.3 presents the specific thin-capitalization rules and the main features of this type of regulation. In section 4.4, a comprehensive modeling of the Norwegian earnings-stripping rules will be discussed, and finally, in section 4.5, a summary of the theoretical predictions of the results will be presented.

4.1 Basis for theoretical analysis

The basis of the theoretical modeling is based on Moen et al. (2011) and Schindler and Schjelderup (2012). The model is based on a price-taking multinational firm which has fully owned affiliates in i = 1,…,n countries. The parent is a pure holding firm that is domiciled in country p. Each affiliate produces a homogenous good by the production function $y_i = F(K_i, L_i)$ and are subject to the country-specific corporate tax rate, t_i. The production factors are real capital (K) and labor (L).

The affiliates can by financed by equity, external and internal debt. The external debt is assumed to originate from non-related parties, while the internal debt originates from related affiliates within the multinational firm. The different sources of funding can be written as:

$$E_i = Equity$$
$$D_i^I = Internal\ debt$$
$$D_i^E = External\ debt$$

Given the financing sources, the balance sheet of affiliate i can be stated as $K_i = E_i + D_i^E + D_i^I$ and the balance sheet of the multinational firm $\sum_{i \neq p} E_i = E_p + D_p^E + D_p^I$.

The optimal level of real capital and tax-efficient capital structure is provided to the affiliate by the multinational firm. (Moen et al. 2011, 5-6)

4.2 Capital structure

Modigliani and Miller (1958) formed the basis of modern thinking on capital structure. The Modigliani-Miller Theorem argues that the firm should be indifferent while choosing between equity and debt, since their value will not be dependent on their capital structure. This result is based on the assumption that there are no market imperfections (e.g. (distortive) taxation).

In most countries, debt is tax-preferred compared to equity. Interest expenses are deductible, but the opportunity cost of equity is not. Further, it is well known that both domestic and multinational companies have the opportunity to reduce their tax liability by using debt financing and consequently reducing the corporate tax.

In order to define the tax debt shield, we assume that rental cost of capital are exogenous, $r > 0$.[22] (Moen et al. 2011, 5) Thus, the debt tax shield can be defined as

$$t_i \cdot r \cdot D_i$$

(1)

As stressed earlier, since the opportunity cost of equity is not deductible, there is a tax benefit of using debt. As a result of the critics of the non-tax assumption, Modigliani and Miller (1963) modified their model to reflect corporate tax system. The model incorporated the tax relief given on interest payments to the original irrelevance proposition, but since there was no offsetting of cost of debt, this implied 100% debt financing.

To avoid extreme prediction, the decision on optimal leverage reflects a trade-off between tax benefit and cost of debt financing. Kraus and Litzenberger (1973) provided a classic version of the theory that optimal leverage reflects a trade-off between cost of bankruptcy and tax benefits of debt. Since this model is considering a multinational firm, it can use both internal and external debt. These two types of debt have fundamental differences, but the trade-off theory applies to both kinds.

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[22] Small country assumption

4.2.1 External debt

External debt is assumed to originate from non-related parties. By using the definition from equation (1) we can specify the external debt tax shield in affiliate *i:*

$$t_i \cdot r \cdot D_i^E$$

(2)

As previously pointed out, the optimal external leverage depends on several factors rather than tax savings alone. In addition to the external debt tax shield, debt can be used to reduce agency costs. One problem that can occur, between managers and shareholders, is issues concerning dividend payments and the size of the firm.[23] Since managers and shareholders typically have different interests and incentives, these conflicts can arise. This problem becomes particularly relevant when the firm is experiencing an excessive free cash flow, hence "the free cash flow problem". (Jensen 1986) Thus, higher external debt may limit the free cash flow problem since this will reduce accessible cash flow. [24]

When a firm is issuing more external debt, this will increase the risk of bankruptcy. The company can arrive at a state where it has problems meeting its debt obligations, also called financial distress. Given the assumption of perfect capital markets,[25] risk of bankruptcy is not a disadvantage of debt since it´s simply seen as an ownership change between shareholders and debtors. (Berk and DeMarzo 2011, 512) This definition is rather unlikely, since bankruptcy will impose direct costs, like hiring outside professionals and especially the substantial legal costs that can occur throughout the bankruptcy process. When a firm is experiencing financial distress, indirect costs like loss of customers, loss of suppliers, inefficient liquidations, and cost to creditors may also occur.[26] (Berk and DeMarzo 2011, 512-516) Another cost of being in financial distress is when shareholders prefer not to invest in a project that has a positive net present value. This is referred to as debt overhang or an underinvestment problem. This is costly for the firm since it is giving up profitable

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[23] When there exists information asymmetry it can be difficult for shareholders to motivate managers to invest free cash flow in project that provide a positive net present value, given the relevant cost of capital. (Jensen 1986) Access cash flow can in these cases be used to finance so-called "pet projects".

[24] Keeping the information asymmetry in mind, debtor can be able to monitor managers' action better then the shareholders. All else equal, this will also increase the benefit of using external debt.

[25] Recall the Proposition 1 by Modigliani and Miller (1958)

[26] For an elaboration on costs of bankruptcy and financial distress, see Berk and DeMarzo (2011)

opportunities. (Berk and DeMarzo 2011, 524-525) Since this model is trying to incorporate real-world imperfections, these costs will be taken into account.

With regards to the agency cost, we can extend the standard trade-off theory to include agency cost and benefit of debt. Using the same approach as Berk and DeMarzo (2011), the value of a firm can be defined as:

$$V^L = V^U + PV(ITS) - PV(FDC) - PV(ACD) + PV(ABD) \qquad (3)$$

V^L is the value of the firm, which is dependent on V^U (value of the firm without debt) and the present value of ITS (interest tax shield), FDC (financial distress costs), ACD (agency cost of debt) and ABD (agency benefit of debt). A graphical illustration trade-off theory is shown in Figure 4-1 below.
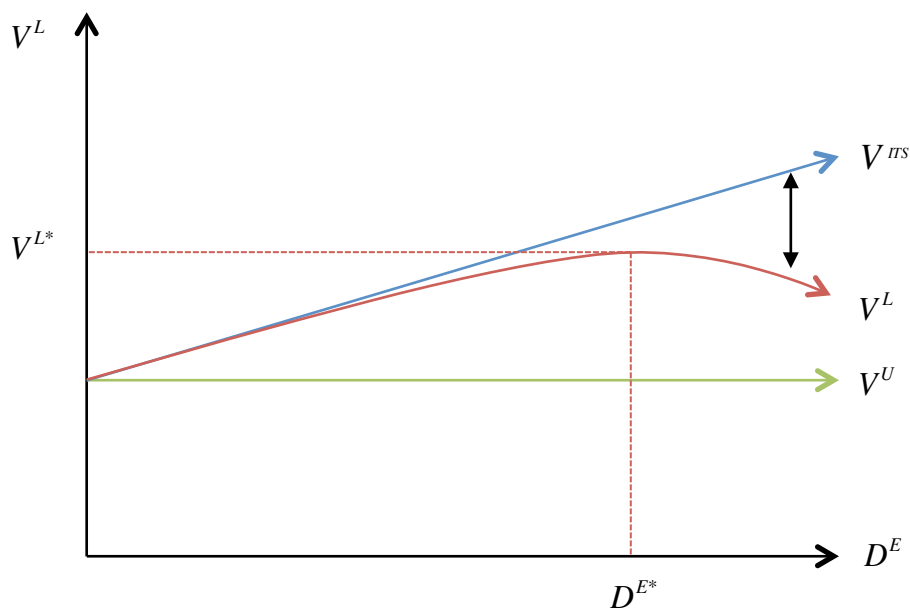
Figure 4-1: *Firm value and optimal leverage*
Source: Own illustration based on Shyam-Sunder and C Myers figure 1 (1999, 220)

V^{ITS} represents the firm's value when including the external debt tax shield, but none of the financial costs that have been discussed above. We see that this coincides with the extreme prediction that the firm will choose 100% debt financing. V^L shows the firm's value, taking all costs into account, and optimal capital structure is defined as (V^{L*}, D^{E*}). The intuition

behind this solution is that the revenue being generated from the interest tax shield is offset by increased costs of debt. The optimal amount of external debt is reached when MR = MC.

To simplify the calculations, in line with Moen et al. (2011), the model will consider the net cost of external debt, C^E. It is important to emphasize that this term does not include the external debt tax shield that was defined in equation (2). Further, Moen et al. (2011, 7) also includes a term for overall bankruptcy costs at the parent level. They argue that the bankruptcy costs are a convex function of the firm-wide external debt-to-asset ratio, since the parent is assumed to guarantee the debt of its affiliates. However, for simplicity, it is assumed that there is no bankruptcy cost on the parent level.[27]

The cost of external debt is assumed to be convex function and dependent on the external debt-to-asset ratio, $b_i^E \equiv \frac{D_i^E}{K_i}$. The convexity of the external debt function can be explained by the higher premium due to the principal-agent problem, as stressed earlier. This kind of assumption is consistent with Moen et al. (2011) and Schindler and Schjelderup (2012):

Assumption 1: Perfect capital markets, except for the financial distress costs and the debt tax shield.

$$C(b_i^E) > 0 \ \ with \ \ C'(b_i^E) > 0, \ \ C''(b_i^E) > 0 \ \ if \ \ b_i^E \geq \overline{b_i^E}$$
$$C'(b_i^E) < 0, \ \ C''(b_i^E) > 0 \ \ if \ \ b_i^E < \overline{b_i^E}$$

The optimal amount of external debt can be achieved by balancing marginal cost of external debt and marginal revenue from the external debt tax shield. We know from equation (2) that the external debt tax shield is positive, since we have assumed $r > 0$ and $t_i > 0$. This tells us that the optimal amount of external debt will be higher than in absences of taxation. This can be shown graphically in Figure 4-2 below.

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[27] The omission of bankruptcy costs on the parent level will not affect the main result of the model

$C^E(b_i^E)$

$C^E(b_i^E)$

b_i^E

b_i^{E*}
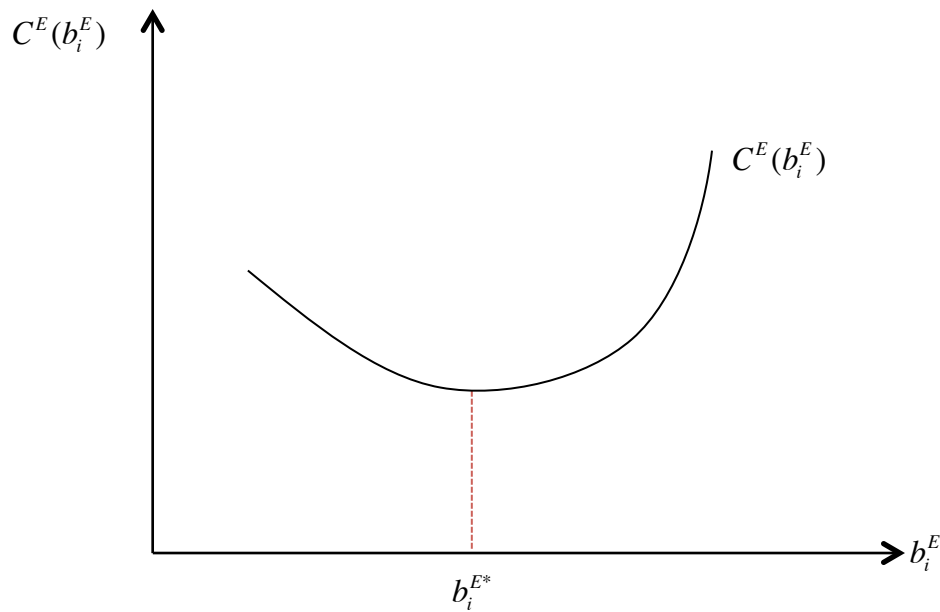
Figure 4-2: *Cost of external debt*
Source: Own illustration

In absence of taxation, the optimal external leverage will be b_i^{E*}. At this point, the net cost of external debt is minimized. Taking taxation into account these costs needs to be balanced against the marginal revenue that is generated from the external debt tax shield. This implies that a higher leverage is preferred. Optimal external leverage will consequently lie somewhere to the right of b_i^{E*}.

4.2.2 Internal debt

Internal debt is assumed to originate from related affiliates. The cost and benefit of using internal debt has some fundamental differences from external debt. Desai, Foley and Hines (2004) argue that multinational firms have the advantage of using internal debt when the market condition is not ideal. They find that affiliates reduce external debt when they are located in countries with underdeveloped markets and weak creditor protections. In contrast to domestic firms, multinationals have the opportunity to issue external debt in more favorable credit markets. (Buettner and Wamser 2013) These benefits will not be further discussed, since the main focus of this thesis will be regarding tax arbitrage opportunities.

A multinational firm is, by definition, located in more than one country. In the illustration below, Figure 4-3, the multinational firm has three different affiliates which each face different tax rates. Assuming that $t_1 < t_2 = t_3$ it can be shown that the multinational firm can increase their worldwide profit by shifting profit towards affiliate 1. In order to achieve this, affiliate 1 can lend money to the high tax affiliates (2 and 3). This will increase the taxable profit in affiliate 1 (due to increased interest income) and reduce taxable profit in affiliate 2 and 3 (due to the internal interest expenses). Profits, which in principle should be taxed in the high tax jurisdiction, have now been shifted to a low-tax jurisdiction, and the total tax burden has been reduced for the multinational firm.

```
                        ┌──────────────┐
                        │   Parent     │
            ┌───────────┤              ├───────────┐
            │           └──────┬───────┘           │
            │                  │                   │
┌───────────────────┐ ┌───────────────────┐ ┌───────────────────┐
│ Affiliate 1       │ │ Affiliate 2       │ │ Affiliate 3       │
│                   │ │                   │ │                   │
│ Statutory tax     │ │ Statutory tax     │ │ Statutory tax     │
│ rate: t₁          │ │ rate: t₂          │ │ rate: t₃          │
└───────────────────┘ └───────────────────┘ └───────────────────┘
```
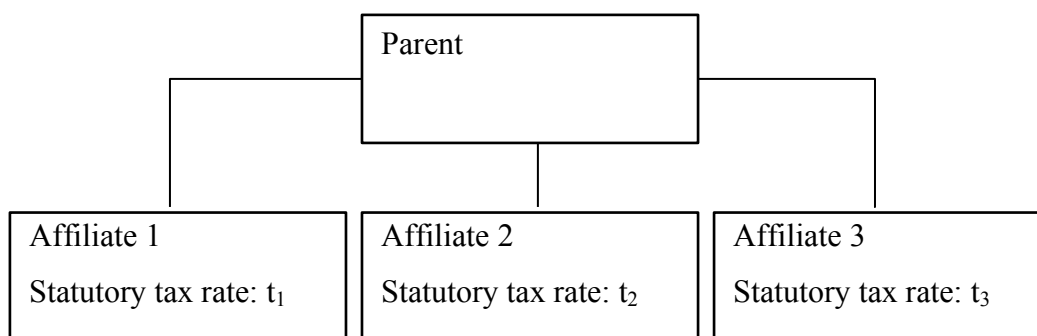
Figure 4-3 – Illustration of a multinational firm (MNC)
Source: Own illustration

It is clear that the low-tax jurisdiction affiliate will operate as an internal bank. (Schindler and Schjelderup 2012, 637,640) This is trivial, since it would not be optimal to locate it in any other jurisdiction.[28] Using the same approach as Moen et al. (2011), the internal debt tax shield can be defined as:

$$(t_i - t_1) \cdot r \cdot D_i^I \qquad (4)$$

It follows that the internal debt tax shield is driven by the difference in tax rates between affiliates and the internal bank. (Ruf and Schindler 2012, 2) Since the difference in corporate tax rates between the affiliates defines the internal debt tax shield, it will consequently never

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[28] In this particular example it can be shown that the internal bank will be located in affiliate 1, since this is the coordination that will generate the most tax savings. $(t_{2,3} - t_1) \cdot r \cdot D_i^I > (t_{1,3} - t_2) \cdot r \cdot D_i^I = (t_{1,2} - t_3) \cdot r \cdot D_i^I$

be higher than the external debt tax shield. In the most extreme case, where the internal bank is subject to no corporate taxation (t_1=0), the internal debt tax shield generates equal revenue to the external debt tax shield.[29]

As Schindler and Schjelderup (2012, 637) point out, the sum of interest payments within the multinational firm must add up to zero. This constraint tells us that the sum of internal interest expenses in affiliates $i > 1$ needs to be equally as large as the internal interest income in the internal bank (affiliate 1). The internal lending constraint can be described formally as:

$$\sum_i r \cdot D_i^I = \sum_i r \cdot b_i^I \cdot K_i = 0$$

(5)

The cost and benefit of using internal debt is quite different compared to external debt. It follows that free cash flow will not be restricted, and bankruptcy costs or monitoring benefit from external creditors will not occur when using internal debt. Consequently, it can be argued that internal debt should be considered as a tax-favored equity. (Schindler and Schjelderup 2012, 638)

In a country that has no regulation on internal debt, internal debt shifting can be a tool to generate tax-arbitrage profits. (Ruf and Schindler 2012, 2) However, since this reduces the tax base in that particular country, most countries have implemented thin-capitalization or controlled-foreign company rules.[30] Circumvention of these rules will induce concealment costs that need to be balanced against the revenue of internal debt shifting. (Ruf and Schindler 2012, 7)

4.3 Specific thin-capitalization rules

In the last two chapters, it has been stressed that multinational firms have the incentives to increase their internal and external debt in an attempt to reduce their tax base. This is an

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[29] Given t_1=0 and assuming that $D_i^I = D_i^E = D_i$, it can be shown that the internal debt tax shield will at the most be equal to the external debt tax shield $(t_i - 0) \cdot r \cdot D_i = t_i \cdot r \cdot D_i$

[30] Controlled-foreign-company rules attempts to prevent low taxation in the resident country of the controlled-foreign-company. These rules will typically deny tax exemption on passive income and force it to be subject to a potentially higher domestic tax rate. These rules are outside of the thesis' range and will not be considered any further. (Ruf and Schindler 2012, 17-18)

issue that is especially relevant for high tax jurisdictions. The tax authorities may attempt to regulate this by introducing rules against debt shifting, and in this section specific thin-capitalization rules will be examined. These rules differ from country to country, but a general characteristic is that the tax deduction on interest income is denied for a loan provided by a related party if debt-to-asset ratio is exceeding a certain threshold. (Buettner et al. 2012, 930)

The following sections will go deeper into the consequences of these rules and assume that two different approaches are possible: leeway and perfectly binding. This means that on the one hand, it is assumed that it will be possible to work around the rules (leeway approach), while on the other, it is assumed that the rules are not possible to circumvent (perfectly binding).

4.3.1 Specific thin-capitalization rule, perfectly binding

Thin-capitalization rules that are perfectly binding, imply that there are no opportunities to get a tax deduction on interest expenses over a defined threshold. This threshold is often referred to as "the safe harbor" and can be defined as $\bar{b}_i^I$. (Buettner et al. 2012, 931) When the leverage exceeds this limit, there will not be any additional revenue to gather from the internal debt tax shield. (Ruf and Schindler 2012, 7) The overall effect, for the multinational firm, of increasing internal leverage above $\bar{b}_i^I$, is negative. The reasoning behind this is that the interest payments will not be deducted, but the interest income in the lending affiliate will be subject to taxation. This implies that the tax rate elasticity of internal debt is zero, since the firm would not respond in a different way if the tax rate changed. (Ruf and Schindler 2012, 7)

When a firm is subject to a specific thin-capitalization rule that is perfectly binding, there will be no costs of concealing within the safe harbor. The intuition behind this is trivial, since it is not necessary to conceal internal debt that is within legal limits. When the firm exceeds the safe harbor, the concealment costs goes to infinity. This must be the case since the thin-capitalization rule is assumed to be perfectly binding. These concealment costs are assumed to be a function of the internal debt-to-asset ratio:

$$C^I = C(b_i^I)$$

<div align="right">(6)</div>

Assumption 2: Cost function of internal lending is assumed to be separable from the external cost function $C(b_i^I, b_i^E) = C(b_i^I) + C(b_i^E)$.

$$C(b_i^I) = 0 \quad with \quad C'(b_i^I) = 0 \ if \ 0 \leq b_i^I \leq \overline{b_i^I}$$
$$C(b_i^I) > 0 \quad with \quad C'(b_i^I) \to \infty \ if \ b_i^I > \overline{b_i^I}$$
$$C(b_i^I) = 0 \ if \ b_i^I < 0$$

The relationship between the marginal internal concealment costs and internal leverage ratio can be shown graphically:
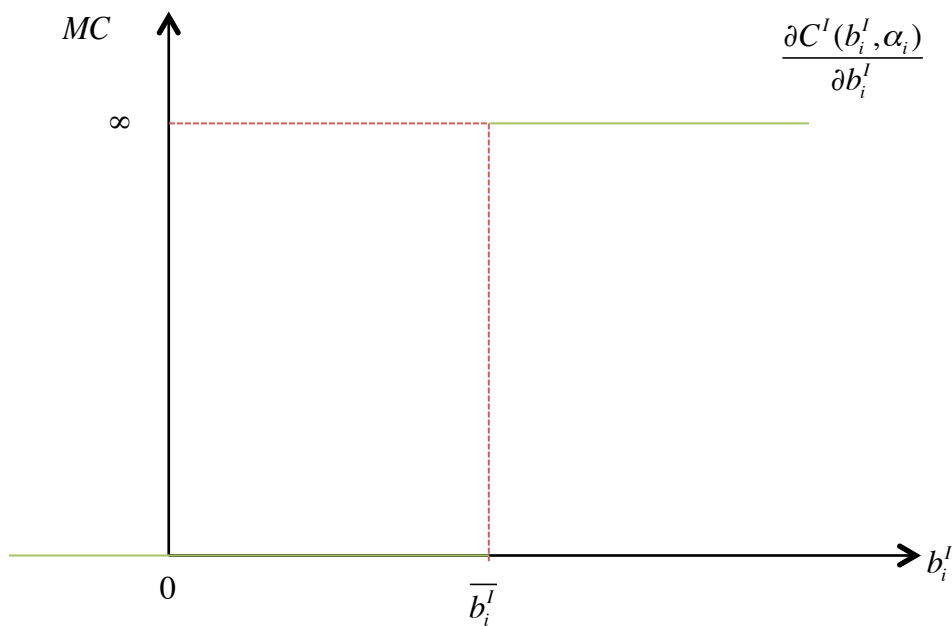
Figure 4-4: *Cost of internal debt, perfectly binding[31]*
Source: Own illustration

It follows from Assumption 2, that there is no cost for the internal lending provided by the internal bank. (Schindler and Schjelderup 2012, 638)

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[31] Given that we can specify an "infinite point" it can be shown that this graph is discontinuous. The reason is as mentioned earlier that marginal concealment costs go from 0 to infinity when the defined threshold is exceeded.

4.3.2 Specific thin-capitalization rule with leeway

Perfectly binding rules can be referred to as an extreme case. Usually a way to work around these rules exists in the form of a loophole. One example, mentioned by Ruf and Schindler (2012, 7-12), highlights the preference given to holding companies in the former thin-capitalization rules in Germany. In this case, the holding companies could operate with an internal debt-to-asset ratio defined as 9:1 (from 2001: 3:1), and other firms had 3:1 (from 2001: 1.5:1).

In general, specific thin-capitalization rules with leeway will consist of a defined threshold for the internal debt-to-asset ratio. However, this threshold can be exceeded by additional concealment efforts. This can typically be done by hiring tax experts or specialized consultants that are able to help the firm exploit the loopholes. These counseling services will increase the cost of internal debt financing. The more internal debt (exceeding the safe harbor), the more counseling service is needed, which leads marginal concealment costs to increase substantially. The concealment costs function is consequently an exponential function of the internal debt-to-asset ratio. (Ruf and Schindler 2012, 7)

The potential loopholes will vary between countries and rule set. Furthermore, the tightness of the rules and how easily they can be circumvented needs to be taken into account when determining the concealment costs. In order to incorporate this "tightness effect", we define the parameter α_i. In line with Schindler and Schjelderup (2013, 15), this implies that the concealment costs are a function of the tightness of the thin-capitalization rules. The relationship is convex and implies that tighter thin-capitalizations rules increase the concealment costs. If the tightness of the thin-capitalization becomes extremely tight, the rules will tend towards being perfectly binding rules.

Assumption 3: Cost function of internal lending is assumed to be (additively) separable from the external cost function $C\left(b_i^I\,\alpha_i, b_i^E\right) = C\left(b_i^I, \alpha_i\right) + C(b_i^E)$. Concealment costs are assumed to be a function of tightness in thin-capitalization rules, as well as internal leverage: $C^I = C^I(b_i^I, \alpha_i)$

$$C\left(b_i^I\alpha_i\right) > 0 \;\; with \;\; \frac{\partial C\left(b_i^I\alpha_i\right)}{\partial (b_i^I)} > 0, \frac{\partial^2 C\left(b_i^I\alpha_i\right)}{\partial (b_i^I)\partial(\alpha_i)} > 0 \; and \; \frac{\partial^2 C\left(b_i^I\alpha_i\right)}{\partial (b_i^I)^2} > 0 \;\; if \;\; b_i^I > \overline{b_i^I}$$

$$C\left(b_i^I \alpha_i\right) = 0 \ \ if \ 0 \leq \ b_i^I \leq \bar{b}_i^I$$

$$C\left(b_i^I \alpha_i\right) = 0 \ \ if \ b_i^I < 0$$

Similar to perfectly binding rules and Assumption 2, it is assumed that there will not be any concealment costs if the internal debt-to-asset ratio is below the defined threshold. As stressed, this is trivial, since it is not necessary to conceal internal leverage ratio that does not exceed the defined threshold. Furthermore, it follows from Assumption 3 that there is no cost for the internal lending provided by the internal bank. (Schindler and Schjelderup 2012, 638)

The relationship between the marginal internal concealment costs and internal leverage ratio can be shown graphically as:
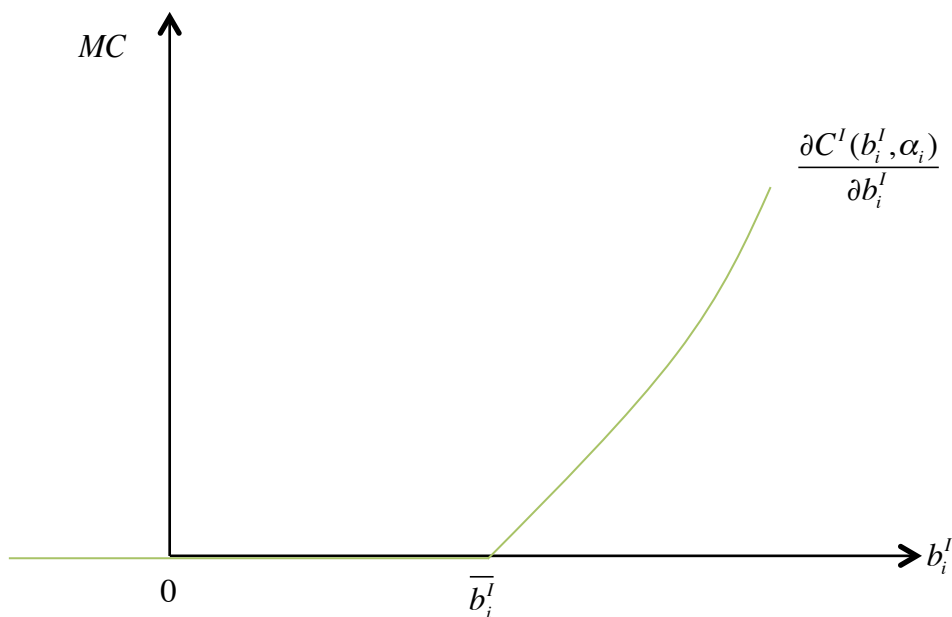
Figure 4-5: *Cost of internal debt, with leeway[32]*
Source: Own illustration

In contrast to perfectly binding thin-capitalization rules, there exist opportunities to increase internal leverage above the defined threshold and still have a positive contribution. Marginal

---

[32] The slope of the graph, after the defined threshold, depends also on the tightness of the thin-capitalization rule, α_i. As stressed earlier, if the tightness goes towards infinity we will end up with the same result as perfectly binding thin-capitalization rules, and consequently a discontinuous graph as Figure 4-4

revenue from the internal debt tax shield needs to be balanced against the concealment costs, and since these are no longer defined as infinitely large, it can be the case that an internal leverage ratio above the defined threshold is optimal. Hence, as long as the marginal revenue from the internal debt tax shield is higher than the marginal concealment cost, it will be profitable to increase the amount of internal debt.

4.4 Modelling Norwegian Earnings-Stripping Rules

As described in Section 3.4, the new rules of limitation on interest deductibility reflects a major fiscal change for mainland Norway. In the following section, the theoretical model will be extended and acquire the main features of the new rule set. The model that is presented in Moen et al. (2011) and Schindler and Schjelderup (2012) will still be the theoretical framework.

In the following, the model will be extended to show two different situations. The first situation implies that the new Norwegian rules are perfectly binding, which is analogous to the situation described in section 4.3.1. The second situation implies that the new rules is not perfectly binding (i.e. leeway approach), which is analogous to the situation described in section 4.3.2.

The new rules are complex and the legal aspects are comprehensive.[33] In order to limit the complexity, specific features will be omitted. Ordinary income is assumed to be equal to the production function subtracted with the net interest and labor costs. Tax deprecation is assumed to be zero. Furthermore, financial income and expenses are assumed to only originate from interest-bearing debt, which is subject to taxation. Using the same example as in section 3.4 we can define the basic calculations:

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[33] The review of the Norwegian Earnings-stripping rules is simplified, as stressed under section 3.4. There are several legal issues that can be considered beyond what is reviewed here. However, the main features of the rule set are included in the modeling.

Example from 3.4		**Defined equations**
Ordinary income	200	$[F(K_i, L_i) - w_iL] - r[b_i^E + b_i^I]K_i$
Tax deprecation	50	Assumed to be zero
Net taxable interest expenses	150	$r[b_i^E + b_i^I]K_i$
Whereof internal	20	$r[b_i^I]K_i$
Whereof external	130	$r[b_i^E]K_i$
EBITDA$^{\text{TAX}}$	**400**	$[F(K_i, L_i) - w_i \cdot L]$

If taxable income is positive, the carry-forward can be used so that taxable profit reaches zero before the implication of the deduction limitation. However, loss carry-forward is assumed to not be relevant due to simplification considerations. Furthermore, external loans are considered as internal debt if a related party has provided security for the debt. The implication of this assumption is that $r[b_i^E]K_i$ will not consist of any interest expenses from external debt that has a guarantor, since this will be reclassified as internal debt. Given these assumptions, we specify the calculation further by using the same example as in section 3.4:

Example from 3.4		**Defined equations**
Net taxable interest expenses	150	$r[b_i^E + b_i^I]K_i$
30%[EBITDA$^{\text{TAX}}$]	120	$30\%[F(K_i, L_i) - w_i \cdot L]$
Denied interest deductibility	30	

In the interests of further simplification and limitation of notation, the defined threshold will be written as:

$$30\%[F(K_i, L_i] - w_iL] = \mu_{MAX}^D \qquad (7)$$

The model will assume that net taxable interest expenses are above five million kroner for simplicity. The reason is that the earnings-stripping rules do not apply if this threshold is not exceeded, as stressed under section 3.4.

4.4.1 Concealments cots

As shown in the calculations above, as well as earlier discussion, external debt has an indirect influence on the deductibility of internal debt. Given this feature, concealments costs are no longer a function of only internal debt, but total debt. This implies that the difficulty of circumventing the rules is dependent on total debt (b_i) and the tightness of the thin-capitalization rules (α_i). It's further assumed that the costs and benefit of external debt, which was described under section 4.2.1, is separable from the concealment costs function. In addition, it will be assumed that the optimal level of external debt is always below the defined threshold:

Assumption 4: Optimal amount of external debt will always be below the defined threshold. This implies: $r \cdot b_i^{E*} \cdot K_i < \mu_{MAX}^D$

The idea of integrating concealment costs for internal and external debt into one function is motivated by Fjellkjær and Steinum (2013, 35) and can be described as:

$$C^T = C^T(b_i, \alpha_i)\mathbf{1}_{\bar{b}_i} \quad with \quad b_i = b_i^I + b_i^E \tag{8}$$

$$where \; \mathbf{1}_{\bar{b}_i} \begin{cases} 1 \; if \, r[b_i^E + b_i^I]K_i - \mu_{MAX}^D > 0 \\ 0 \; if \, r[b_i^E + b_i^I]K_i \leq \mu_{MAX}^D \end{cases}$$

The indicator function is used to specify where concealment costs are relevant. In order to understand how this coincides with the rule set and defined equations, each alternative will be explained below.

Indicator function 1 A $1 \; if \; r[b_i^E + b_i^I]K_i - \mu_{MAX}^D > 0$

In this case the concealment costs are relevant, hence 1. Of the indicator function, we see that concealment costs occur if $r[b_i^E + b_i^I]K_i - \mu_{MAX}^D$ is strictly positive. The intuition behind this is that net taxable interest expenses are above the defined threshold. Given the assumption that optimal external debt is below the defined threshold, μ_{MAX}^D, we know that any amount above this threshold represents internal debt.

Indicator function 1 B $\qquad 0\ if\ r[b_i^E + b_i^I]K_i \le \mu_{MAX}^D$

In this case, the concealment costs are defined as 0. This will always be the case where net interest expenses are below the defined threshold, $r[b_i^E + b_i^I]K_i \le \mu_{MAX}^D$. This is intuitive since it will not be necessary to conceal costs when the net interest expenses are within the limits of the law.

4.4.2 Total debt tax shield – Perfectly binding rules

The total debt tax shield, $\prod_{i \ne 1}^{PBR}$, specifies what will happen to the deductibility of interest expenses in different states. In the case of perfectly binding rules, a breakpoint is encountered when one no longer gets deduction of internal interest expenses.

$$\prod_{i \ne 1}^{PBR} = t_i[rb_i^E K_i + \mathbf{1}_{\overline{ITS}}] \tag{9}$$

$$where\ \mathbf{1}_{ITS} \begin{cases} r \cdot b_i^I \cdot K_i\ if\ r[b_i^E + b_i^I]K_i \le \mu_{MAX}^D \\ \mu_{MAX}^D - rb_i^E K_i\ if\ r[b_i^E + b_i^I]K_i > \mu_{MAX}^D \end{cases}$$

The indicator function is used to specify where the internal debt tax shield is relevant. In order to understand how this coincides with the rule set and defined equations, each alternative will be explained below:

Indicator function 2 A $\qquad r \cdot b_i^I \cdot K_i\ if\ r[b_i^E + b_i^I]K_i \le \mu_{MAX}^D$

In this case, there are no changes or interception to internal debt. There will be no interception if net interest expenses are below or equal to the maximum deduction threshold, $r[b_i^E + b_i^I]K_i \le \mu_{MAX}^D$.

Indicator function 2 B $\qquad \mu_{MAX}^D - rb_i^E K_i\ if\ r[b_i^E + b_i^I]K_i > \mu_{MAX}^D$

In this case the indicator function tells us that if net taxable interest expenses are above the defined threshold, internal debt will be subject to interception. However, interest expenses within the threshold will not be intercepted. Given Assumption 4, and the fact that the rules is perfectly binding, the amount of internal interest expenses that will be deductible is defined as $\mu_{MAX}^D - rb_i^E K_i$.

4.4.3 Total debt tax shield – Rules with leeway

In this case, we assume that it's possible to work around the new rules. A potential loophole which can be exploited is the organization with a permanent establishment in Norway, as discussed in section 3.4. However, it should be noted that the tax authorities can use the general Norwegian "piercing rule" to prevent these kinds of adaption and deny deductibility of the excessive interest expenses which occur because of these actions. In addition, it can be assumed that it is possible to exceed the threshold of interest deductibility by hiring tax experts that can find other loopholes in the Norwegian earnings-stripping rules. With this assumption in mind, the total debt tax shield can be formalized:

$$\prod_{i\neq 1}^{RWL} = t_i \cdot [r(b_i^E + b_i^I)K_i]$$

(10)

In this case, we see that there is no direct interception of internal interest expenses. The reason is that it is assumed that the rules can be circumvented, and the firm will find the optimal leverage balancing against the costs of circumventing these rules.

4.4.4 Profit functions

In order to derive what the optimal capital structure is, one must define the multinational firm's profit function. Using the same approach as in Moen et al. (2011) and Schindler and Schjelderup (2012) it is assumed that the multinational firm maximizes the value of the firm after corporate taxes. The global profit for the multinational firm can be described as the after tax profit of all of its affiliates, which can be described formally as:

$$\pi = \sum_{i=1}^{n} \pi_i^E - t_i \cdot \pi_i^T$$

(11)

π_i^E reflects the economic profit in an affiliate, π_i^T reflects the taxable profit, and t_i reflects the cooperate tax rate in country *i*. The economic profit is given by revenue from sales subtracted with labour cost and total capital costs (potential concealment costs and costs of external debt). Formally, this can be written as:

$$\pi_i^E = F(K_i, L_i) - w_i L - [r + C^T(b_i, \alpha_i)\mathbf{1}_{\overline{b_i}} + C^E(b_i^E)]K_i \qquad (12)$$

The taxable profit differs from the economic profit. Schindler and Schjelderup (2012, 639) assumes that costs related to the debt-to-asset ratio are tax deductible. This is in contrast to the approach used by Moen et. al (2011, 7), which assumes that these costs are not deductible. In Section 3.3 it was assumed that this model would follow the same approach as by Moen et. al (2011) due to simplification considerations. This means that the difference between economic and taxable profit is that equity and total costs of debt are not tax deductible. Formally, taxable profit can be described as:

$$\pi_i^T = F(K_i, L_i) - w_i L - [rb_i^E K_i + \mathbf{1}_{\overline{ITS}}] \qquad (13)$$

$$\pi_i^T = F(K_i, L_i) - w_i L - [r(b_i^I + b_i^E)]K_i \qquad (14)$$

Equation (13) represents the taxable profit function of an affiliate that is subject to perfectly binding rules. It follows that equation (14) represents the taxable profit function of an affiliate that is subject to a rule set that offers loopholes (leeway approach). After having defined the respective profit functions, we can further derive profit maximization problems for the different approaches to the new Norwegian rule set.

4.4.5 Perfectly binding rules

Based on the information that has been discussed in section 4.4, we have now provided enough information to formalize the profit maximization problem.

Profit maximization problem A

$$\max_{b_i^E, b_i^I} \pi = \sum_{i=1}^n \left\{ \begin{array}{c} (1 - t_i) \cdot [F(K_i, L_i) - w_i L] - rK_i + t_i[rb_i^E K_i + \mathbf{1}_{\overline{ITS}}] \\ -[C^T(b_i, \alpha_i)\mathbf{1}_{\overline{b_i}} + C^E(b_i^E)]K_i \end{array} \right\}$$

$$s.t. \sum_{i=1}^n rb_i^I K_i = 0 \text{ and } b_i = b_i^I + b_i^E$$

where $\mathbf{1}_{ITS}$ $\begin{cases} r \cdot b_i^I \cdot K_i \ if \ r[b_i^E + b_i^I]K_i \le \mu_{MAX}^D \\ \mu_{MAX}^D - r b_i^E K_i \ if \ r[b_i^E + b_i^I]K_i > \mu_{MAX}^D \end{cases}$

where $\mathbf{1}_{\overline{b}_i}$ $\begin{cases} 1 \ if \ r[b_i^E + b_i^I]K_i - \mu_{MAX}^D > 0 \\ 0 \ if \ r[b_i^E + b_i^I]K_i \le \mu_{MAX}^D \end{cases}$

Of the maximization problem we see that there exists a constraint that all interest payments between affiliates must sum up to zero. This was called the internal lending constraint, recalling (5). Using the Lagrange method to solve this profit maximization problem:

Lagrange maximization problem A

$$\mathcal{L}(b_i^E, b_i^I, \lambda) = \sum_{i=1}^{n} \left\{ \begin{matrix} (1 - t_i)[F(K_i, L_i) - w_i L] - r K_i + t_i(r b_i^E K_i + \mathbf{1}_{\overline{ITS}}) \\ -[C^T(b_i, \alpha_i)\mathbf{1}_{\overline{b}_i} + C^E(b_i^E)]K_i \end{matrix} \right\} - \lambda \sum_{i=1}^{n} r b_i^I K_i$$

First order conditions A

$$\begin{matrix} \max \pi \\ b_i^E \end{matrix} \Rightarrow \underbrace{t_i \cdot r}_{MR} - \underbrace{\left(\frac{\partial C^E(b_i^E)}{\partial b_i^E} + \frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^E} \right)}_{MC} = 0 \ if \ [r(b_i^I + b_i^E)]K_i - \mu_{MAX}^D > 0 \qquad (15)$$

$$\begin{matrix} \max \pi \\ b_i^E \end{matrix} \Rightarrow \underbrace{t_i \cdot r}_{MR} - \underbrace{\left(\frac{\partial C^E(b_i^E)}{\partial b_i^E} \right)}_{MC} = 0 \ if \ [r(b_i^I + b_i^E)]K_i \le \mu_{MAX}^D \qquad (16)$$

$$\begin{matrix} \max \pi \\ b_i^I \end{matrix} \Rightarrow \underbrace{(t_i - \lambda) \cdot r}_{MR} > 0 \ if \ [r(b_i^I + b_i^E)]K_i \le \mu_{MAX}^D \qquad (17)$$

$$\begin{matrix} \max \pi \\ b_i^I \end{matrix} \Rightarrow \underbrace{(-\lambda) \cdot r}_{MR} - \underbrace{\left(\frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^I} \right)}_{MC} < 0 \ if \ [r(b_i^I + b_i^E)]K_i - \mu_{MAX}^D > 0 \qquad (18)$$

Where λ is the Lagrangian multiplier, which reflects the shadow price of using internal debt. The shadow price must be interpreted as the increase in tax in the internal bank, due to the debt shifting. In line with Schindler and Schjelderup (2012) we can now determine which affiliate will act as an internal bank:

Assumption 5: Define country 1 as the country that holds the lowest tax rate. Tax-efficient structure, where the difference in tax rate drive the internal debt tax shield, implies: $\lambda = min_i t_i \equiv t_1$

Affiliate in country 1 (financial bank) will run with an economic loss ($\pi_1 - t_1 \pi_1^t < 0$) due to the internal lending. Recalling that equity is not tax deductible, while interest payments are subject to taxation, this implies that taxable profit is positive ($\pi_1^t > 0$). The opportunity costs of internal lending activities can be derived as the costs of equity multiplied with the tax rate $(-E_1 \cdot t_1 r)^{34}$. For the multinational firm as a whole we see that the lending affiliate will offset these costs since $t_1 \le t_i$. (Schindler and Schjelderup 2012, 640)

In order to understand how the multinational firm will decide the amount of debt, both internally and externally, the first order conditions need to be examined.

(15) states that when net taxable interest expenses are above the defined threshold, marginal revenue from the external debt tax shield needs to be balanced against the marginal costs of debt and marginal concealments costs. We see that the marginal revenue is positive even though the firm exceeds the defined threshold. The intuition behind this is that external debt is still tax deductible, since the rules only intercept internal interest expenses.

(16) states that when net taxable interest expenses are equal or below the defined threshold, marginal revenue from the external debt tax shield needs to be balanced against the marginal costs of debt. It follows from earlier assumptions that there will be no concealment costs when net taxable interest expenses are within the defined threshold.

(17) states that when net taxable interest expenses are equal to or below the defined threshold, the marginal revenue of using internal debt is strictly positive. Since there are no costs to balance the marginal revenue against, it would be optimal to increase the internal leverage until the defined threshold is reached.

---

[34] Using the same approach as Schindler and Schjelderup (2012, 640) this can be derived by omitting sales and leverage costs from the internal bank. Assuming that θ represents economic profit from lending, economic loss can be derived: $\pi_1 - t_1 \pi_1^t = [\theta_1 r - r(D_1^E - E_1)] - t_1[\theta_1 r - D_1^E r]$, where $\theta_1 = D_1^E + E_1$
Which leads to the following simplification: $\pi_1 - t_1 \pi_1^t = [-E_1 \cdot t_1 r]$

(18) states that when the net taxable interest expenses are higher than the defined threshold, the marginal revenue turns negative. The intuition behind this is that with perfectly binding rules there will be no opportunities to get more deduction of internal interest expenses than given by the defined threshold. In this case the lending affiliate will not get deduction for its internal lending expenses, but the internal bank will have to pay tax for the interest income.

4.4.6 Rules with leeway

Based on the information that has been discussed in Section 4.4, we have now provided enough information to formalize the profit maximization problem. It should be noted that additional arguments for the leeway approach were also stressed under Section 3.4.

Profit maximization problem B

$$
\max_{b_i^E, b_i^I} \pi = \sum_{i=1}^{n} \left\{ \begin{array}{c} (1 - t_i) \cdot [F(K_i, L_i) - w_i L] - rK_i + t_i r[b_i^E + b_i^I]K_i \\ -[C^T(b_i, \alpha_i)\mathbf{1}_{\bar{b}_i} + C^E(b_i^E)]K_i \end{array} \right\}
$$

$$
s.t. \sum_{i=1}^{n} r b_i^I K_i = 0 \text{ and } b_i = b_i^I + b_i^E
$$

$$
where \ \mathbf{1}_{\bar{b}_i} \left\{ \begin{array}{c} 1 \ if \ r[b_i^E + b_i^I]K_i - \mu_{MAX}^D > 0 \\ 0 \ if \ r[b_i^E + b_i^I]K_i \leq \mu_{MAX}^D \end{array} \right.
$$

As in the last section we see that there exists a constraint that all interest payments between affiliates must sum up to zero. Using the Lagrange method to solve this profit maximization problem:

Lagrange maximization problem B

$$
\mathcal{L}(b_i^E, b_i^I, \lambda) = \sum_{i=1}^{n} \left\{ \begin{array}{c} (1 - t_i)[F(K_i, L_i) - w_i L] - rK_i + t_i r(b_i^E + b_i^I)K_i \\ -[C^T(b_i, \alpha_i)\mathbf{1}_{\bar{b}_i} + C^E(b_i^E)]K_i \end{array} \right\} - \lambda \sum_{i=1}^{n} r b_i^I K_i
$$

First order conditions B

$$
\begin{array}{c} \max \pi \\ b_i^E \end{array} \Rightarrow \underbrace{t_i \cdot r}_{MR} - \underbrace{\left(\frac{\partial C^E(b_i^E)}{\partial b_i^E} + \frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^E} \right)}_{MC} = 0 \ if \ [r(b_i^I + b_i^E)]K_i - \mu_{MAX}^D > 0 \tag{19}
$$

$$\max_{b_i^E} \pi \Rightarrow \underbrace{t_i \cdot r}_{MR} - \underbrace{\left(\frac{\partial C^E(b_i^E)}{\partial b_i^E} \right)}_{MC} = 0 \;\; if \;\; [r(b_i^I + b_i^E)]K_i \leq \mu_{MAX}^D \tag{20}$$

$$\max_{b_i^I} \pi \Rightarrow \underbrace{(t_i - \lambda) \cdot r}_{MR} > 0 \;\; if \;\; [r(b_i^I + b_i^E)]K_i \leq \mu_{MAX}^D \tag{21}$$

$$\max_{b_i^I} \pi \Rightarrow \underbrace{(t_i - \lambda) \cdot r}_{MR} - \underbrace{\left(\frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^I} \right)}_{MC} = 0 \;\; if \;\; [r(b_i^I + b_i^E)]K_i - \mu_{MAX}^D > 0 \tag{22}$$

Where λ is the Lagrangian multiplier, which has the same specifications as discussed in the last section, 4.4.5

In order to understand how the multinational firm will decide the amount of debt, both internally and externally, the first order conditions need to be examined.

(19) states that when net taxable interest expenses are above the defined threshold, marginal revenue from the external debt tax shield needs to be balanced against the marginal costs of debt and marginal concealment costs. We see that the marginal revenue is positive, even though the firm exceeds the defined threshold. The intuition behind this is that external debt is still tax deductible, since the rules only intercept internal interest expenses. In summary, this will be identical with perfectly binding rules.

(20) states that when net taxable interest expenses are equal to or below the defined threshold, marginal revenue from the external debt tax shield needs to be balanced against the marginal costs of debt. It follows from earlier assumptions that there will be no concealment costs when net taxable interest expenses are within the defined threshold. In summary, this will be identical with perfectly binding rules.

(21) states that when net taxable interest expenses are equal to or below the defined threshold, the marginal revenue of using internal debt is strictly positive. Since there are no costs to balance the marginal revenue against, it would be optimal to increase the internal leverage until the defined threshold is reached. In summary, this would be identical with perfectly binding rules.

(22) states that when net taxable interest expenses are above the defined threshold, the marginal revenue needs to be balanced against the marginal concealments costs. Since the rules are not perfectly binding, it's possible to circumvent the rules. The costs of circumventing will be significant and increase when more internal debt is used, cf. Figure 4-5. If the rules are extremely tight or expensive to circumvent, the marginal concealment costs will go towards infinity, and the result will be similar to the perfectly binding case. Formally, $\frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^I} \to \infty$.

4.4.7 Determine optimal amount of debt

The first order conditions, which were discussed in the two previous sections, explain how internal and external debt will be chosen. The idea of how to determine the optimal mix, which will be explained in this section, is partly motivated by Fellkjær and Steinum (2013, 42-46) The optimal mix of debt entails that marginal increase of internal or external debt provides the same amount of profit. This tells us that the marginal profit, with respect to external leverage, needs to be equal to marginal profit with respect to internal leverage:

$$\frac{\partial \pi}{\partial b_i^I} = \frac{\partial \pi}{\partial b_i^E} \qquad (23)$$

By inserting the first order conditions in (23) we get:

$$t_i \cdot r - \frac{\partial C^E(b_i^E)}{\partial b_i^E} - \frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^E} = (t_i - t_1) \cdot r - \frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^I} \qquad (24)$$

It follows from equation (24) that agency costs and concealments costs are separable. Total concealment costs are assumed to be a function of total debt. It will further be assumed that the marginal impact of concealment with respect to internal and external debt is the same.

$$\frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^I} = \frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^E} \qquad (25)$$

This leads to the following simplification:

$$t_i \cdot r - \frac{\partial C^E(b_i^E)}{\partial b_i^E} = (t_i - t_1) \cdot r \Leftrightarrow t_1 \cdot r = \frac{\partial C^E(b_i^E)}{\partial b_i^E} \qquad (26)$$

Of (26) we see that there will be a trade-off between costs of external debt and tax payments in the internal bank on internal debt. This can be exemplified by looking at a hypothetical situation in affiliate *I*. The affiliate has the option of financing internal (D_i^I) or external (D_i^E). The affiliate will get the same deduction in either case, since the tax rate will be the same. However, the two financing alternatives have fundamentally different "costs". The cost of financing internally is associated with the increased tax burden, which is the product of the internal bank tax rate and the interest rate. The cost of financing externally is associated with the agency cost of external debt. In this case, the multinational firm does not have any taxable interest income in other affiliates, like the internally financing alternative. The financing decision is shown graphically in the figure below:
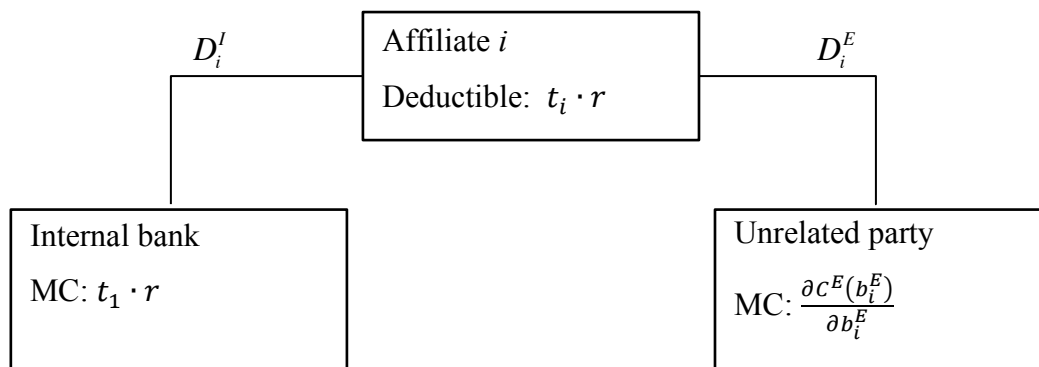
Figure 4-6 – *Financing decision (MNC)*
Source: Own illustration

In order to fully understand how this trade-off works, we can imagine a multinational firm fully financed by equity. Recalling Figure 4-2, we see that the agency cost of external debt is a convex function, and it follows that the first units of debt actually have a negative marginal cost. Comparing this against the tax payments in the internal bank makes it clear that the firm will choose to finance the first unit of debt externally. However, the marginal costs of external debt will eventually be equal to the marginal tax payments in the internal bank.
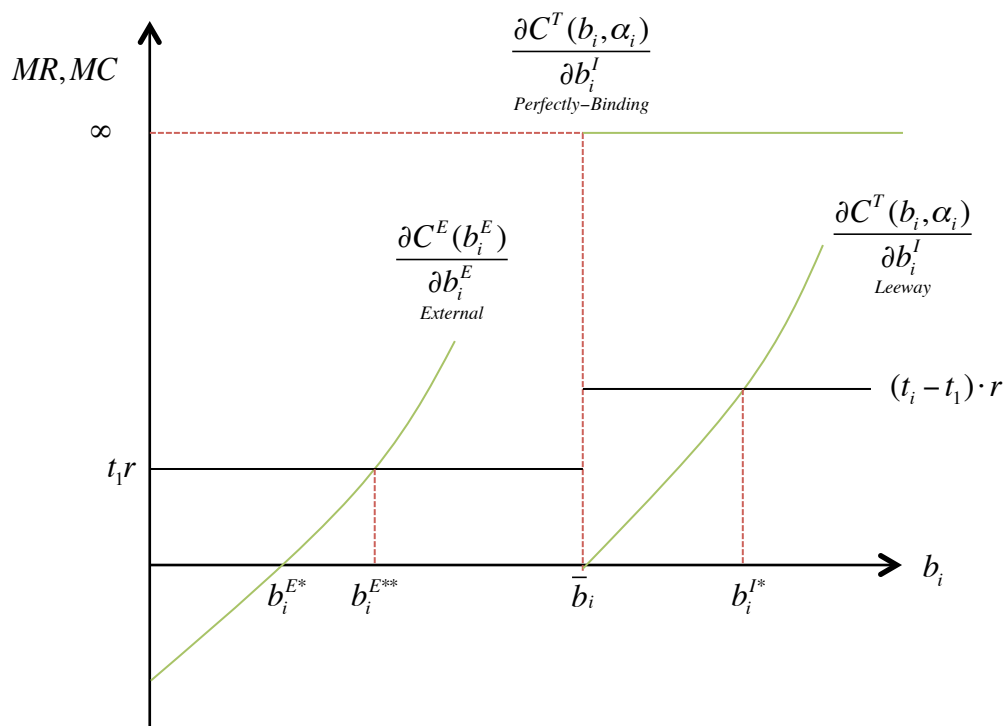
In accordance to Assumption 4, the optimal amount of external debt will be below the defined threshold. This implies that when the firm reaches optimal external leverage (b_i^{E**}), it will be optimal to increase leverage by using internal debt until $r[b_i^E + b_i^I]K_i = \mu_{MAX}^D$. This applies for both perfectly binding and the leeway approach. The reason is that for both approaches, perfectly binding and leeway, the first order condition for internal leverage will be the same below the defined threshold: $\underbrace{(t_i - \lambda) \cdot r}_{MR} > 0 \; if \; r[b_i^E + b_i^I]K_i \leq \mu_{MAX}^D$.

At the point where $r[b_i^E + b_i^I]K_i = \mu_{MAX}^D$ the concealment costs for the two approaches differ. In the case where we have perfectly binding rules, the strictness of the rules makes it infinitely costly to circumvent the rules. However, the leeway approach is assumed to be less strict and consequently provides a lower cost of increasing the leverage above the defined threshold. Formally, this cost relationship can be shown as:

$$\underbrace{\frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^I}}_{Perfectly \quad binding} > \underbrace{\frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^I}}_{Leeway} \qquad (27)$$

As stressed, it can be optimal to increase internal leverage above the defined threshold if the rules offer some loopholes. Equation (22) tells us that marginal concealment costs need to be balanced against the marginal revenue of internal debt shifting. The process, which has been discussed, can be illustrated graphically:

$$\frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^I}$$
Perfectly–Binding

$$\frac{\partial C^E(b_i^E)}{\partial b_i^E}$$
External

$$\frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^I}$$
Leeway

Figure 4-7: *Optimal mix of debt with different rules*

Source: Own illustration motivated by Fellkjær and Steinum (2013, Figure 3-6, 50)

In Figure 4-7 we see that b_i^{E**} reflects the optimal external leverage.[35] After this point it is optimal to use internal debt until the threshold $\overline{b}_\iota$ for both rule sets.[36] However, leverage above this threshold is only optimal if the rule set offers a leeway.

4.4.8 Optimal mix – easing the assumption of external debt

In the last section we assumed that optimal external debt was below the defined threshold. In order to further understand the trade-off between external debt and internal debt this assumption will be disregarded. It will further be assumed that the optimal external debt is equal to or above the defined threshold. This leads to the result that Indicator function 1 A in Section 4.4.1 is not necessarily correct. The intuition behind this is that it is possible to have interest expenses above the defined threshold without any occurrence of concealment costs.

---

[35] Recalling Figure 4-2, the optimal external debt with absence of taxation is denoted by b_i^{E*}

[36] The leverage denoted $\overline{b}_\iota$ is assumed to be the point where $r[b_i^E + b_i^I]K_i = \mu_{MAX}^D$.

Assumption 6: Optimal amount of external debt will always be above the defined threshold. This implies: $r \cdot b_i^{E*} \cdot K_i > \mu_{MAX}^D$

To consider the leeway approach we use the same approach as was given formally by equation (23). This explained that the marginal profit, with respect to external leverage, needed to be equal to the marginal profit, with respect to internal leverage. By inserting the first order conditions (19) and (22) we get:

$$t_i r - \frac{\partial C^E(b_i^E)}{\partial b_i^E} - \frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^E} = (t_i - t_1)r - \frac{\partial C^T(b_i, \alpha_i)}{\partial b_i^I} \qquad (28)$$

Of this expression we see that the firm needs to compare the marginal net gain against the marginal concealments costs. However, the Norwegian rules state that external debt has an indirect influence in restricting internal debt shifting. As stressed, this means that external debt will not be denied interest deductibility. As a result of this, the companies can avoid the costs of concealment if they only finance externally.[37] Formally a situation where the firms only choose external debt, and it is more profitable, can be described as:

$$\underbrace{[t_i r b_i^E - C_i^E(b_i^E)]K_i}_{External} \geq \underbrace{[t_i r(b_i^E + b_i^I) - C_i^T(b_i, \alpha_i) - C_i^E(b_i^E)]K_i}_{External/Internal} \qquad (29)$$

A situation where the best combination of external and internal debt provides less profit than only external debt can be explained by a steep concealment cost curve. This is typically relevant if the rules are very tight, but not necessary perfectly binding. Conversely, if the concealment costs curve is less steep it becomes more attractive to combine internal and external debt. The intuition behind this is that less concealment costs make the combination of debt alternative more attractive.

The perfectly binding approach will also have the possibility of achieving interest expenses above the defined threshold. This approach will never find it optimal to have any internal interest expenses above the defined threshold, since concealments costs are infinitely high.

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[37] The firms need to take into account the exemptions on external financing where the debt can be reclassified as related party debt. This was discussed in more detail in section 3.4.

However, it is possible to exceed the defined threshold by only using external debt.[38] This is possible since external debt has only an indirect role in limiting interest deductibility. This can be seen in the light of the German regulations, which limit internal and external interest expenses directly. The German rules will consequently not open for the same adaptation as the Norwegian rules.

A situation where only external financing is optimal can be shown graphically:
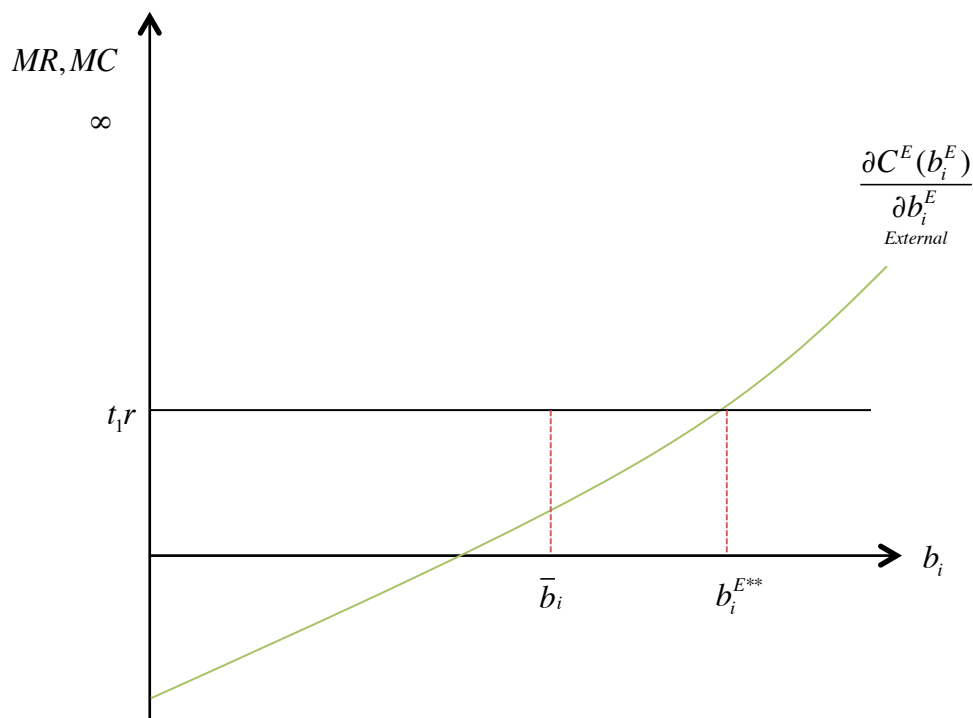
Figure 4-8: *Optimal debt when a combination of debt is less attractive*
Source: Own illustration

As in the previous figures, $\overline{b_i}$, is the leverage that gives net interest expenses equal to the defined threshold. In line with Assumption 6, we can see that optimal external leverage is above the defined threshold.

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[38] When companies obtain debt higher than the defined threshold it do not necessarily means that the company has excessive debt. Since the defined threshold is defined as a percentage of a fixed result size, this will not necessarily be the optimal threshold for all type of businesses. Consequently, one can expect that firms could have a higher debt than the threshold implies, but at the same time be within arm's length standard. This aspect will not be discussed further in the matter of the rule's effectiveness.

4.5 Summary - Theoretical predictions

The theoretical modeling has provided results that can indicate how firms will react to the new Norwegian earnings-stripping rules. It should be noted that the theoretical modeling has been conducted with certain key assumptions. There may be some legal aspects that have been left out, for simplification considerations, which may have been significant. Whether the rules provide significant loopholes that companies can use is also uncertain. Because these rules are brand new and effective from 01.01.2014, there exists little legal precedent and empirical evidence.. However, it is expected that the main findings of the theoretical modeling will essentially give a good indication of potential adaptations of the companies that are affected by the rules.

In contrast to the specific (traditional) thin-capitalization rules, external interest expenses have an indirect effect on deductibility of internal interest expense. In 4.4.7, it was argued that if optimal external debt was below the defined threshold, it could be optimal to have internal interest expenses above the defined threshold for the leeway approach. How much debt above the defined threshold was determined by the strictness of the rule set. The perfectly binding approach increased the internal interest expenses until the defined threshold was reached. Since this approach offers no loopholes, additional units of internal debt would not be optimal. In 4.4.8, this assumption was eased, and it was assumed that optimal external debt was above the defined threshold. Since external interest expenses are not subject to interception, the firm can eliminate internal interest expenses and only use external debt. This substitution makes it possible to increase leverage above the defined threshold without risk of not getting deductions on their interest expenses. This result indicates that even with perfectly binding rules, one can substitute internal debt with external debt and achieve a leverage that is above the defined threshold. Such opportunities for circumvention mean one can question the effectiveness of the rules.

It should be noted that the external debt above the defined threshold must be achieved without any guarantees that reclassify the debt as internal debt. It can be argued that this is possible since 30% of EBITDA^{TAX} is not necessarily the limit of excessive debt for every company. This was also pointed out in the extravasation of the rules that firms could experience denied deduction for interest expense that would previously have been approved by the arm's length principle. (Finansdepartementet 2013a, 113)

5. Empirical review

The lack of studies in this field is surprising, especially with respect to earnings-stripping rules. However, the following two sections look at three specific research papers which are significant for the topic of this thesis. First, Buettner et al (2012), as well as Blouin et al. (2014), looks at the impact of traditional thin-capitalization rules worldwide. Second, a working paper of Buslei and Simmler (2014) that looks at the transmission from traditional thin-capitalization rules towards earnings-stripping rules will be reviewed. Like the previous two articles, these results could also tentatively be linked to the Norwegian rules. Since Norway introduced their first earnings-stripping rules in January 2014, there is not any empirical work on these rules yet. Finally, in the last section, there will be an attempt to summarize the articles and indicate what one may expect from the new Norwegian rules.

5.1 Impact of thin-capitalization rules on capital structure

Buettner et al (2012) analyze the effectiveness of thin-capitalization rules in their paper "The impact of thin-capitalization rules on the capital structure of multinational firms." By using a micro-level panel dataset of multinational firms, provided by the Deutsche Bundesbank, they are able to analyze German multinationals and their foreign affiliates. This database, to which Deutsche Bundesbank grants access, is called the "MiDi Database." They use data from 1996-2004 and are able to obtain information regarding each affiliate's capital structure in the form of internal and external debt. This extended information about capital structure allows the authors to investigate possible side effects on external debt while restricting internal debt. Internal debt consists of loans from the parent and/or loans from another affiliated entity.

In order to analyze the effectiveness of the thin-capitalization rules, Buettner et al (2012) use two sources of empirical variation. The rules that each country practices will normally change over time. Whether the country has a rule or not will also vary over time. Table 1 and Table A.1 (Buettner et al. 2012, 932, 937) show that the existence of thin-capitalization rules and the safe haven debt-to-equity ratio varies over time. The dataset contains affiliates from 36 countries that introduced, abolished, tightened and loosened the restriction in the time

period 1996-2004. Buettner et al (2012) construct two variables, "Rule" and "Tight", to capture the tightness and existence of the thin-capitalization rules.[39]

Buettner et al (2012) first perform a regression analysis, where the dependent variable is the internal debt ratio. They find that a 10 percentage point increase in statutory tax rate predicts a 2.14 percentage point increase in internal debt ratio (Buettner et al. 2012, Table 4 Column (1)). Further, they include an interaction term with the constructed variable "RULE" that indicates a negative relationship between the internal debt ratio and the existence of a thin-capitalization rules, which is illustrated in term (2) below. When controlling for the difference between thin-capitalization rules, they still get a highly significant negative result. The tightness of the rules may be explained whether the rules impose restriction on related party or total debt. Buettner et al (2012) find that restrictions imposed on total debt exert stronger effects, and they can't find any significant changes with regards to related party debt.

Terms	Estimation Result (Standard Error)	
(1) Statutory tax rate (STR)	0.214**	(0.095)
(2) STR x RULE	-0.049*	(0.028)
(3) STR x TIGHT	-0.287**	(0.12)
(4) STR x TIGHT (related party debt)	-0.116	(0.092)
(5) STR x TIGHT (total debt)	-0.588**	(0.209)

Table 1: *Dependent variable: Internal debt ratio.*

*significant at 10%; **significant at 5%*

Source: Based on results from Table 4 in Buettner et al. (2012)

These results can be used to predict how capital structure will change if a country implements thin-capitalization rules. Assuming that Country A implements an internal debt-to-equity restriction on 2:1, this indicates a tightness of 0.33.[40] Furthermore, assuming that Country A has the same tax rate as the sample average, 34%, predictions on changes in

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[39] Variable "Rule" is a dummy variable that reflects weather a thin capitalization rule exists in the country j in period t. Variable "Tight" reflects a non-linear transformation of the debt-to-equity ratio. Range of this is 0-1 where 1 is extremely tight. (Buettner et al. 2012, 933)

[40] 0,33 is calculated by using the indicator of tightness presented in Buettner et al (2012, 933)

capital structure are a reduction of internal debt-to-asset ratio of 3.22 percentage points (≈0.34 * 0.33 * -0.287). However, if the country sets restrictions regarding total debt, the predicted reduction of the internal debt-to-asset ratio is 6.59 percentage points. (≈0.34 * 0.33 * -0.588) Of these findings, it is clear that restrictions on total debt exert stronger effects on internal debt ratio than restrictions on related party debt.

Buettner et al (2012, 936) provide a second regression in Table 5, where they test parent debt ratio and external debt ratio as dependent variables. Parent debt is included in the internal debt measure, which was used above. Due to practical difficulties in defining related party debt for tax purpose, the authors focused on debt from the parent firm to analyze the effect of thin-capitalization rules. By using the same approach as above, we can use the estimation result to provide a predicted reduction of the parent and external debt ratio. If a country introduces the same internal debt-to-equity restriction and has the sample average tax rate, the predicted decline of the parent debt ratio is 3.16 percentage points (≈0.34 * 0.33 * -0.282) given the estimation result from Table 5, Column (3). If the restriction is determined by total debt, the predicted decline of the parent debt ratio is 5.50 percentage points (≈0.34 * 0.33 * -0.489), given the estimation result from Table 5, Column (4). Buettner et al (2012, 936) argue that these results indicate that the sensitivity of internal debt towards thin-capitalization rules is mainly driven by parent debt.

The second part of Table 5 looks at external debt ratio as a dependent variable. Given the same assumptions, if a country introduces an internal debt-to-equity restriction, the predicted increase in external debt ratio is 2.00 percentage points (≈0.34 * 0.33 * 0.176) given the estimation result from Table 5, Column (7). If the country introduces a debt-to-equity restriction that defines the restrictions in total debt, the predicted increase in external debt is 2.80 percentage points (≈0.34 * 0.33 * 0.246). The estimates show that external debt increases even more when safe haven is determined by total debt. Intuitively one would expect that external debt should decrease when implementing total debt restrictions. This result will not be examined more closely, but it is possible that it is just random, due to lack of precision in the estimates.

The summarized table below shows that the introduction of thin-capitalization rules effectively reduces the internal debt ratio. However, the external debt ratio is increasing, which indicates a substitution effect between internal and external debt. As Buettner et al

(2012, 937) point out, these findings lead to a reduction in total leverage, although external debt increases. The reason is that the reduction of internal leverage is greater than the increase in external leverage. The findings are summarized in Table 5 below.

Ratio affected by thin-capitalization rules	Percentage points affected
Internal debt-to-asset ratio	3.22 percentage points decline
Internal debt-to-asset ratio, restriction on total debt	6.59 percentage points decline
Parent debt ratio	3.16 percentage points decline
Parent debt ratio, restriction on total debt	5.50 percentage points decline
External debt ratio	2.00 percentage points increase
External debt ratio, restriction on total debt	2.80 percentage points increase

Table 2: Summarized calculations

Source: Based on calculations from Buettner et al. (2012)

Another study that analyzes the impact of thin-capitalization rules is Blouin et al. with their paper "Thin Capitalization Rules and Multinational Firm Capital Structure" (2014). Their dataset contains thin-capitalization rules from 54 countries in the time period 1982-2004. By using BEA data (US Bureau of Economic Analysis) they are able to examine the capital structure of foreign affiliates of US multinationals.

During the data period, nine countries introduced total debt restrictions and eight countries introduced internal leverage restrictions. In Table 3 (Blouin et al. 2014, 39), it is shown that restrictions on total leverage tend to have a significant effect on both internal and total leverage. The countries that implemented total debt restrictions (Panel A) got a mean decrease in both internal and total leverage of 4.5%. The reduction in leverage was negative in all cases, but only statistically significant in six out of eight countries. The countries that implemented internal debt restrictions (Panel B) had a 4.6% decline in total leverage and 3.3% decline in internal leverage, on average. As in the previous case, the reduction in both total and internal leverage was negative in all cases, but only statistically significant in six

out of eight countries. These results indicate that thin-capitalization rules have a significant impact on capital structure.

In order to test specifically, Blouin et al. (2014) present regressions which look at the direct impact that thin-capitalization rules have on capital structure. In Table 4 in Blouin et al. (2014, 41), the regression analysis of an affiliate's total leverage is presented. In Regression 4, the authors use a "total leverage restriction" variable to capture the effect of a debt-to-asset restriction on total debt. The result is highly significant and indicates that these kinds of restrictions reduce the debt-to-asset ratio by 1.9%.

Further, Blouin et al. (2014) test whether restrictions that directly relate to internal leverage have an impact on internal leverage. In Table 5, Blouin et al. (2014, 42) present the regression analysis for this matter. Regression 4 presents the "internal leverage restriction," which captures the effect of restricting internal leverage. The internal leverage restriction (parent-to-equity) declines by 6.3% when internal thin-capitalization rules are implemented. This result is highly significant and implies that internal restrictions have a significant impact.

Finally, Blouin et al. (2014, 44) show in Table 7 how thin-capitalization rules that restrict internal leverage may have an indirect effect on total leverage. This is typical if internal and external leverage are imperfect substitutes. The "internal leverage restriction" captures the decline due to the debt-to-asset restriction on internal debt, which shows a 0.8% decline. Comparing this result to the result from Table 4 in Blouin et al. (2014, 41), we see that the impact is more than halved. This tells us that internal leverage restriction on total leverage is about half as effective as total leverage restrictions on total leverage.

The result from Blouin et al. (2014) are be summarized in the table below.

Results	Estimation Result (Standard Error)	
(1) Debt-to-asset restriction	-0.0186***	(0.00691)
(2) Parent-to-equity restriction	-0.0629***	(0.0224)
(3) Debt-to-asset restriction (parent debt)	-0.0082***	(0.0009)

Table 3: *Regression results *** significant at 1%*

Source: Based on result from Tables 4, 5 and 7 in Blouin et al. (2014)

These results indicate that thin-capitalization rules have a significant impact on the firm's capital structure. Blouin et al. (2014) extend their analysis and look at the effectiveness if there is some discretion in their application of thin-capitalization rules. In their dataset, 40.6% of the countries that practice thin-capitalization rules open for a discretionary consideration. In Table 8 in Blouin et al. (2014, 45), they show that the impact of the thin-capitalization rules is reduced by 61% ($\approx$0.0169/0.0276) if it is possible that there may be a discretionary assessment. Narrowing it to total leverage restrictions, the impact of the thin-capitalization rules is reduced by 48% ($\approx$0.0109/0.0229). This result is, however, not significant. Looking at internal leverage restrictions, the impact of the thin-capitalization rules is non-existent due to the discretionary considerations. Summarized, they find that the discretionary option may influence thin-capitalization rules on total leverage, which suggests that more automatic rules are more effective.

5.2 Impact of earnings-stripping rules

The previous studies look at traditional thin-capitalization rules and the effectiveness of introducing these kinds of restrictions. In this section, the focus will be on earnings-stripping rules. A working paper by Buslei and Simmler (2014) analyzes the impact of introducing the new earnings-stripping rules in Germany. The time period is 2006-2008, in order to capture the potential changes from the traditional thin-capitalization rules and towards the new earnings-stripping rules.[41] Buslei and Simmler (2014, 8) are using a difference-in-difference

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[41] A short review of the historical thin-capitalization rules in Germany was described in section 2.1

approach where they compare the result of a treatment group and a control group, both before and after the reform.

The German earnings-stripping rule includes a number of different features than the Norwegian earnings-stripping rules. Like the Norwegian rules, the German approach allows 30% of tax-adjusted EBITDA to be deductible. However, in contrast to the Norwegian rules, both internal and external interest expenses above this defined threshold will be subject to interception. On the other side, the German rules has a higher exemption limit than the Norwegian rules (1 million euro ≈ 7.8 million kroner).[42] Further, the interest carry-forward period is five years for the German rule and ten years for the Norwegian rules. The German rules also opens for two different clauses (group and escape clause)[43] that the Norwegian rule set has not implemented. These differences are summarized in Table 4 below.

German earnings-stripping rules	Norwegian earnings-stripping rules
30% of tax-adjusted EBITDA deductible	30% of tax-adjusted EBITDA deductible
Internal and external interest expenses above this threshold will be intercepted	Internal interest expenses above this threshold will be intercepted
Exemption limit: 1 million euro	Exemption limit: 5 million kroner
Interest carry-forward period is five years	Interest carry-forward period is ten years
Group clause and escape clause	Permanent establishment[44]

Table 4: Norwegian and German earnings-stripping rules main features

Source: Own illustration

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[42] 1 million euro is approximately 7,8 million kroner (≈1 M EUR / 0,1283). These calculations is based on the yearly average exchange rate for 2013 which is calculated in Exhibit 3, page 69

[43] The German earnings-stripping rules do not apply for firms that are not a part of a consolidated group (group clause) or if the firms are able to prove that their debt-to-asset ratio is equal or less than its group average (escape clause). For a more elaborate version look at Ruf and Schindler (2012, 13-14)

[44] The Norwegian rules set does not provide the same exemptions as the German rules. However, a potential loophole is the permanent establishment that was discussed in Section 3.4

Buslei and Simmler (2014) use the firm database DAFNE. From this database, they are able to analyze the basis on financial statements for all incorporated German firms. Since this database only contains data from German companies, they are not able to control for the escape clause. As the authors point out, to control for this clause, information about the group structure is needed. However, in order to cope with this, the dataset is divided into two different samples. Sample 1 provides only firms with a net interest result near the exemption threshold of 1 million euro.[45] In this sample, the escape clause is assumed to have a minor relevance. Sample 2 provides all firms that are affected by the thin-capitalization rules.

Buslei and Simmler's (2014, 17, Table 2) estimation shows that the implementation of the new earnings-stripping rules reduced the debt-to-asset ratio of sample 1 firms by 5.3 percentage points between 2006 and 2008. This result is given that the net interest expenses are constant. They further split up the result by looking at changes in internal and external debt ratio, and the reduction of these ratios is approximately equal (Buslei and Simmler 2014, 34, Table A.5). This result indicates that there is no substitution between internal and external debt, which intuitively regards that the earning-stripping rule sets restriction on total debt. In Table 3, Buslei and Simmler (2014, 19) investigate whether the firms near the defined threshold of 1 million euro exploit this limit by splitting up their assets. They find that firms that split up their assets do not reduce their debt ratio and can therefore use this as an avoidance strategy in order to avoid the interest barrier.[46]

In Sample 2, all firms that are potentially affected by the new earning-stripping rules are included. This includes also the firms near the exemption limit. Buslei and Simmler's (2014, 21, Table 4) estimation shows that the debt ratio declined by 2 percentage points between 2006 and 2008. This decline is smaller in absolute terms, compared to Sample 1. However, the authors argue that this can partially be attributed to the fact that large firms use the escape clause more often, which they were not able to control for.

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[45] Buslei and Simmler argues that small firms will choose other measures than the escape clause, since this often will create the need of structure changes within the group. This can be an expensive and complex way to avoid the earnings-stripping rules. They further assume that firms with net interest expenses up to 1.5 million euro behave in this way.

[46] The estimation of changes in debt ratio of firms that split up their assets is shown at the bottom of Table 3 in Buslei and Simmler (2014, 19). The result shows no significant changes in debt ratio (Coefficient: (1) + (3): -0,005, insignificant).

Summarized, Buslei and Simmler (2014) confirm that the German earnings-stripping rules do have a significant impact on the firms' capital structure. They find that firms near the exemption limit can avoid interest payments being denied deductibility by reducing their debt ratio or by splitting up their assets. The latter does not broaden the tax base of Germany and questions the effectiveness of the earning-stripping rules. One positive development regarding the tax base of Germany is that no substitution opportunities exist between external and internal debt with the new rule set.

5.3 Implication for the Norwegian Approach

The few studies available may provide an indication of how tax authorities should develop an effective tax regime with respect to debt shifting. The results will also be used to indicate what to expect from the Norwegian rules.

Traditional thin-capitalization rules, or specific thin-capitalization rules, have been a prevalent approach to regulate debt shifting. As discussed in Section 5.1, the effectiveness of the rules is somehow questioned by Buettner et al. (2012). The fixed ratio approach has proven to reduce the internal debt ratio, but this effect is offset by an increase of external debt. This substitution effect is not perfect, but indicates that the effectiveness of the rules are reduced. Relating this result to the Norwegian approach, one may argue that possibilities to substitute internal debt in favor of external debt exist. Recalling equation (29), a firm can find it optimal to only choose external debt. However, the opportunities to substitute are limited since external debt indirectly affects the deductibility of internal interest expenses. With this in mind, the firms need to eliminate all internal debt in order to have excessive external interest expenses.[47] Buslei and Simmler (2014) address the substitution question with respect to the German earnings-stripping rules, and their results indicate that there is no substitution between internal and external debt. Intuitively, this is expected since the restrictions on deductibility are directly related to both internal and external interest expenses.

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[47] Excessive external interest expenses must be understood as interest expenses that exceed 30% of taxable EBITDA.

Buettner et al. (2012) also find evidence that indicate that total debt restrictions exert stronger effects than restrictions on related party debt. These findings relate to traditional thin-capitalization rules, but they may indicate that this also counts for earnings-stripping rules. Given the possibility to substitute internal debt with external debt in the Norwegian approach, one can argue that these rules can be considered less strict than the German approach. An interesting topic for further research would be to compare how both the Norwegian and German approach affects the firm's capital structure. It might be interesting to investigate both in terms of the possible loopholes that the different sets of rules hold, but also the potential impact of the German rule set, which no longer needs to make judgments on whether the debt comes from related parties or not. This assessment is pointed out as a weakness by Buslei and Simmler (2014, 1) who argue that this can be problematic, given the complex group structures, and may worsen the effectiveness of the regulation.

Blouin et al. (2014) provide an important finding about the application of thin-capitalization rules. Their results indicate that rules which open for discretionary assessment may reduce the effectiveness of the thin-capitalization rules. The argument for discretionary options is that this approach will address each case individually and ensure justice. However, the fact that administrative costs can be extremely high and the existence of asymmetric information between the firms and the tax authorities may hamper the effectiveness.

Buslei and Simmler (2014) point out that the exemption limit on the German earnings-stripping rules hampers the effectiveness of the rules. Their results indicate that firms are able to avoid the exemption limit by shifting assets into new subsidiaries. This potential consequence, also known as the Norwegian regulations, was drafted. Of preparatory work, Prop.1 LS Tillegg 1, it follows that they were aware of the potential differences this could create between taxpayers and possible unfavorable adjustments (Finansdepartementet 2013b, 53). In this case, it is natural to consider the consequences of being able to rule out many small- and medium-sized companies from regulations against adverse adaptations. However, it should be noted that the German exemption limit of 1 million euro is significantly higher than the Norwegian exemption limit of 5 million kroner, which further suggests that fewer companies can leverage off this in the Norwegian rule set.

Since none of the above articles are researching rules that are identical to the Norwegian rules, one must proviso that the indicated results can be partly generalized. Although

traditional thin-capitalization rules have significant differences from earnings-stripping rules, one should expect that some results are transmitted between the sets of rules.

6. Conclusions

This thesis has examined the interest deduction limitation rules, also called the Norwegian earnings-stripping rules. The thesis has been divided into three parts. The first part consists of the legal framework that generally describes the main features of the new Norwegian rules. The second part is based on the legal framework and presents a theoretical model for the derivation of optimal capital structure. The final section looks at three relevant empirical articles. These articles look at rules that aim to prevent thin-capitalization, although the rules used are not completely identical to the Norwegian rules. Throughout this paper, I have attempted to answer the following overall issue:

> *"Will the new Norwegian earnings-stripping rule prevent debt shifting more efficiently than traditional thin-capitalization rules, which restrict the companies debt to asset ratio?"*

Norway has chosen to abolish the arm's length principle in favor of the earnings stripping rules. In theory, one could argue that this is a less effective regulation. The assumptions that underlie this claim, however, are so strict that they do not reflect the real world imperfections.

The new Norwegian earnings-stripping rules apply from the fiscal year 2014 and are designed to prevent companies from stripping earnings via intercompany debt financing. The rules limit the deductibility of interest expenses that originate from related party and third party debt where a related party has provided security for the debt. Third party debt is not subject to interception, but it can displace the deductibility of internal interest expenses.

The predictions from the theoretical model suggest that the new Norwegian earning-stripping rules can effectively reduce the leverage of firms that are embraced by the rules. However, since the new rules do not restrict deductibility of external debt, this indicates that it can be optimal to use external debt in favor of internal debt. Having a capital structure with only external debt entails that the firm can achieve a higher debt ratio than what was initially accepted. Such a type of substitution is also to some extent confirmed by the empirical literature, but it should be noted that the indirect impact that external debt holds will limit the opportunities for effective substitution. An interesting result is that this can be achieved

regardless of whether or not one assumes that the rules are perfectly binding or consist of potential loopholes (leeway approach).

The effectiveness of new rules partly depends on the existence of potential loopholes. In the elaboration of the legal framework, it was indicated that foreign companies, which have limited tax liability in Norway, could adapt to these rules due to tax planning reasons. Since the Norwegian rules recently came into force, there exists, at present, no case law or administrative practice for cases where the regulations are circumvented. This makes it difficult to say anything specific about whether it is easy to circumvent the rules or not.

I think the new rules for mainland Norway are a step in the right direction to limit tax avoidance in Norway. This is justified in that the arm's length principle is not considered to be a sufficient alternative. On top of this, several OECD countries have already introduced thin-capitalization rules to limit deductibility of interest expenses. However, it is expected that the tax authorities follow the effect of these rules carefully. Based on experience, the authorities should consider possible changes and customization of the new Norwegian earnings-stripping rules, this especially with regards to some of the shortcomings mentioned in this thesis.

7. Exhibits

Exhibit 1: Percentage distribution of foreign-controlled enterprises by ownership 2011

Country	Companies	%
Sweden	1752	29%
Denmark	774	13%
United Kingdom	637	11%
USA	528	9%
Germany	321	5%
Netherland	367	6%
Finland	230	4%
Switzerland	200	3%
France	190	3%

Source: SSB (2013)

Exhibit 2: Development in Corporate Tax Rates 1995-2012

Year	EU 27	EU 17	Norway
1995	35,3%	36,8%	28%
1996	35,3%	37,0%	28%
1997	35,2%	37,0%	28%
1998	34,1%	35,8%	28%
1999	33,5%	35,2%	28%
2000	31,9%	34,4%	28%
2001	30,7%	33,0%	28%
2002	29,3%	31,8%	28%
2003	28,3%	30,4%	28%
2004	27,0%	29,6%	28%
2005	25,5%	28,1%	28%
2006	25,3%	27,7%	28%
2007	24,5%	26,8%	28%
2008	24,0%	26,3%	28%
2009	23,9%	26,2%	28%
2010	23,7%	26,2%	28%
2011	23,4%	25,9%	28%
2012	23,5%	26,1%	28%

Source: Eurostat (2013)

Exhibit 3: Historical exchange rate EUR/NOK 2013

Description	Rate
Period Average	0.1283
Period High	0.1354
Period Low	0.1188
December 2013	0.1188
November 2013	0.1219
October 2013	0.1232
September 2013	0.1252
August 2013	0.1261
July 2013	0.1266
June 2013	0.1293
May 2013	0.1323
April 2013	0.1326
March 2013	0.1335
February 2013	0.1346
January 2013	0.1354

Source: http://www.oanda.com/

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