The Reform of the Notional Interest Deduction in Belgium: Evidence of the Impact on the Cost of Equity and the Financing Decisions of Belgian Companies.

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2. Introduction

In 2018, the Belgian government decided to progressively enforce several modifications to the Belgian tax system. More than just minor changes, this reform aims at changing the paradigm present in Belgium since decades. The objective of the government is to reduce the tax burden on companies and create simpler but more effective fiscal rules.
Part of this reform, the government decided to bring some modifications to the often criticized Notional Interests Deduction (NID) regime. When introduced in 2006, the official and un-official objectives followed this tax incentive were multiple: Continuing the coordination center regime to maintain the fiscal attractiveness of Belgium, strengthen balance sheet of companies by reducing the cost of equity, stimulate investment and employment in Belgium by reducing the effective tax rate on corporate income. Those objectives have been commented and studied many times in the literature but the exact effect on the Belgian economy as a whole is still not clear.

In this paper, my objective is to study and comment the impact of the new NID regime in Belgium but also to discuss the potential implications on a hypothetical European taxation system.
In a first time, I will go back to the evolution of the literature related to the tax-induced bias discriminating the equity over debt when it comes to financing new projects. I will discuss the consequences of the bias on the balance sheet of companies and the related risks. I will try to show the current situation in Europe and the different initiatives that aim at tackling the issue.
In a second time, I will discuss the successive measures introduced in Belgium to fill the gap between debt and equity financing. I will compare the effects of each policy with a theoretical reference model and comment the evolution of the effective tax rate under the under the different regimes.
In the last section of this paper, I will build a quasi-experimental study to find evidences of the impact of the new NID regime on the leverage of Belgian companies and for the public budget. Using the results obtained and the learnings from the literature, I will discuss the opportunity to introduce a NID in a European common taxation system. I will try to bring to light some of the biggest challenges of such a regime what would be the potential pros and cons to finally conclude.

3. Literature Review

3.1. Cost of debt and Cost of Equity

Through this section, I will spend some time looking at the evolution of the notion of cost of capital and cost of debt in the economic literature to finally demonstrate where the Allowance for Corporate Equity principles come from. We can already state that the revolutionary structure of the measure is due to the fact that, for the first time in the turbulent history of our corporate tax system, it is rooted in the economic reality companies have to deal with. Indeed, fiscal laws are often vehicles targeting specific value streams of the national economy to bring money for the government's budget and obviously are based on political ideologies. The ACE must be seen as an economic stabilization tool aiming at influencing companies behavior. To illustrate this differentiation, it is important to understand the economic background that led to the creation of the ACE system.

First of all, we should have a look at the first theories about the arbitrage between equity financing and debt financing. In their publications Modigliani and Miller tried to demonstrate the independence between the value of the firm and the financing decisions. Their first paper helps us define what the cost neutrality between using debt or using equity to finance new investments is.
They imagined their model in a perfect market, which implies that the following assumptions were met:

- Securities can be freely traded at competitive market prices equal to the present value of their future cash flows.
- There are no taxes, transactions costs, risk premium and insurance costs.
- Firms financing decisions do not induce changes in the generated cash flows and do not send signals to the markets.
- Symmetry of information.

To them, if those conditions are met, it does not make any difference whether a company decides to finance new investments with new debt or new equity. The cost of financing new investments is exactly the same in both situations and is completely independent from the chosen financing option. It implies that the total return of a project will not be linked to the opportunity or not to finance it with debt or with equity. The value of the

firm is only based on operating incomes and future prospects. Of course, they didn't consider any bias factor such as imperfect market conditions or external factors such as tax systems, but their model will be the starting point for my research.

Other research has showed that theoretically the value of a company is not affected by financing decisions as it should be in a perfect world. Indeed, many internal and external factors to the company do have an impact on the optimal financing decisions. In our modern economies the adverse information and sometimes opposite interests between managers and shareholders can create agency costs and lead to harmful decisions for the company. That risk can be moderated by using more debt as it forces managers to be disciplined and reduces the agency costs for shareholders. The utilization of debt in a too large extent can also lead to distress costs as the risk of bankruptcy is higher and needs to be controlled. I will spend more time on those risks later in this paper.

Another bias factor we need to consider is the pecking-order theory (Myers, 1984) that induces a debt preference over equity. The theory is based on the signals sent to the market when top-executives of a company make a decision and the increase of financing costs following the announcement. The theory tells us that if a company decides to finance a new project, it has different options, all sending a different message to the market.

- The company can use the retained earnings or internal resources, the cost is minimal as there are no fees and no asymmetric information. It also means that a company is strong enough to internally finance new projects and is ready to assume the full risk of the project.

- If the company needs external financing, managers tend to prefer to issue debts. It signals the project is believed to be profitable and the company is undervalued. The new project is expected to have a higher return than the market interest rate, and therefore will increase the value of the company. The share of the return above the interest rate paid on the debt will be the current shareholders profits and they don't want to share this profit with new investors.
- On the opposite, the issuance of equity sends the signal that the company is overvalued and the managers are trying to seize that opportunity to

generate financing by diluting shares. They will finance new projects by selling new shares because they are at a high price and they want to benefit from it.

Finally, the most important external factor for this paper is the distortion induced by the personal and corporate tax systems enforced by governments. The unequal treatment of debt financing and capital financing is the root cause of what is commonly known as *the Tax Shield.*

3.2. Tax-induced Bias

i. Theoretical framework

The origins of the *Tax Shield* theories go back to the time when Joseph Stiglitz published his paper *"Taxation, corporate financial policy, and the cost of capital"* in 1973 in the *Journal of Public Economics.* It that paper he proved, by using the US Tax Codes, that fiscal laws are enforcing an unequal treatment of debt and equity. This unequal treatment leads to arbitrage opportunities between the two financing sources. The impact of tax laws on financing decisions has been discussed many times between those who believe the correlation exists and those who do not. It is later that King (1974), based on Stiglitz' work, demonstrated the impact of fiscal laws on financial structures of companies and their investment behaviors. He proved that the optimal investment policy is determined by the cost of capital. He agreed with Modigliani and Miller on the fact that in the absence of specific constraints on the financial policy of a company and without taking inflation and investment incentives into account, the cost of capital is the interest rate. The cost is independent of the financing method. But in a second time he proved that in an economy with legal constraints to prevent tax avoidance and where externals finance companies' investments, the previous theories don't hold anymore. The cost of capital depends on the optimal financial policy but also on the expected tax rates changes in the future. The conclusion is that the sax system is no longer just a way of collecting money for the government, but also a tool to influence firms' behaviors by changing tax rates or announcement effects.

Those contributions are evidence of the dependency between tax rules and the financial structures of companies. But to understand the precise role of the ACE system, which is a tax-factor, as stabilization tool, we need to have a closer look at those interactions between taxes and capital structure.

The modern tax system allows companies to pay interests on debts as a cost. It means they have the same treatment regarding wages, supplies and materials, energies, travelling costs, etc.
They are subtracted from the EBIT to calculate the net income, so they are not included in the taxable base. Those interests are *de facto* exempted from corporate tax and the cost of debt financing for companies is limited to the interest rate of their borrowings. It also means that investors who lend money to a company see their money being imposed only one time at their personal income tax rate and the final return on the money lent is theoretically the market interest rate.

On the opposite, if we have a look at the minimal cost of capital, it is divided between the market interest rate (Often based on the return of State bonds) and a premium paid for the risks induced by equity such as no priority in case of bankruptcy, responsibility of owners, dividends are paid after interests. The dividends, which are return on equity, consist in a redistribution of a share of the net income of the company to the equity holders. It means that the final amount allowed to shareholders will be taxed twice: In the first time by the corporate tax on the profits of the company and secondly by the personal income tax on the dividends they receive.

We can cite the Weichenrieder and Klautke (2008) study that puts numbers on the strength of the correlation between corporate tax rate and debt-asset ratio in the present. They conclude that an increase of 10% in the corporate tax rate will result in an increase of 1.4 up to 1.6% of the debt-asset ratio. It proves that an increased corporate tax rate makes equity financing more expensive, pushing companies to adapt their financing structure.

To give an illustration, the company will have to generate more revenues to distribute a net revenue of 100€ for shareholders than a net revenue of 100 € for debtholders.

This highlighted the idea that the cost of equity is higher than the cost of debt for stakeholders due to the non-taxation of debt interests' payments in the corporate tax code, this difference and the resulting savings are known as *The Tax Shield* we spoke about earlier.

A consequence of the *Tax shield* is that the theories consisting in considering the value of the company independent from the financial structure is no longer true. The actual total value of the leveraged firm is equal to the total unleveraged value of the company augmented by the value of the tax savings provided by debts. The value of the tax savings is defined by the amount of debt multiplied by the corporate tax rate. The total value can be written as follows:

$$V_{Leveraged} = V_{Unleveraged} + \tau Debts \qquad \text{where } \boldsymbol{\tau} \text{ is the Corporate Tax Rate.}$$

So in theory, a company can maximize its value if it is completely financed with debt.

But as debt represents an always bigger share of the companies' liabilities the risks of distress, of agency costs and of becoming vulnerable to a recession or to an external downturn are growing. As a consequence, the cost of debt is increasing too. That is why companies still use a mix of debts and equity. A 100% debt-financed company would be considered as an outlier. Here what is important is the proportion of the two financing sources in the total financing structure. The leverage ratio, the amount of debt compared to the total amount of equity, is the proportion of debt financing into the total financing of the company. This ratio is the common measure uses to describe the level of debt a company is using and compares companies. Companies with a high leverage ratio tend to use a lot of debt, we can therefore assume they are benefiting in a large extent from the tax shield to optimize their value, but they are also more exposed to distress.

The outcome of that distortion is the emergence of an optimal leverage ratio (Kraus, 1973) in the middle between the tax shield provided by the exemption of corporate tax on debt interests and the distress costs induced by a too high leverage.

Another consequence of that discrimination is the appearance of the new vehicles and structures built by companies and investors to finance new projects. Thanks to the creativity of bankers and legal councils, they managed to structure investments as debts, although it could be seen as very close to an investment in equity. Those very long-term debts, often convertible into stocks, have clauses to be renewed easily on the due date. They are very hard to be recovered before the due date, can be traded between investors and often pay a higher interest rate than the market rate. It can be seen as a very stable source of financing for a company, like equity, but at a lower cost for the shareholders since they receive exempted interest payments instead of dividends. This is pure tax optimization and this is another consequence of the discrimination between debt and equity financing, resulting in an even higher optimal leverage ratio for the company and its shareholders.

In that context, companies' top decision-makers tend to push their leverage ratio higher and higher in order to pay less taxes and boost the value of the company and leave the ownership structure unchanged (Fama, 2012). Furthermore, as the Investor's confidence grows and because interest rates are low, the perceived risk of distress, downturn or insolvency diminishes, thereby reinforcing that trend.

ii. Costs and risks induced

Following the 2008 crisis, the economic world has become more and more familiar with the notion of systemic risk, in particular in the banking sector. We have come to realize that a crisis starting in the financial sector can also deeply hurt the whole economy and lead to the collapsing of blue chip companies in every other segment of the economy. This domino effect has been fueled by a strong dependency of every economic player on credit due to the trends of over-leveraging companies. Once the debt financing sources stopped, many companies faced distress and made it difficult to sustain operations. The social, political and economic crisis have proven to many people the risks and costs induced by debt fueled bubbles.

Many research tried to show evidenc of the correlation between the debt bias and the cost for the society as a whole, which is commonly known as *Welfare cost*.

Depending on the sources, the total welfare cost of the debt bias is estimated between 0.08% and 0.23% of the GDP (Weichenrieder 2008) or more than 0.25% of the GDP (Gordon 2010). In the case of the study conducted by Weichenrieder, they calculated the efficiency cost of the distorted capital structure for the economy. A few years later, De Mooji (2011) suggested that those costs might by under-evaluated. Indeed, he exposed that the two studies don't take in account every segment of the economy and the chosen elasticity in the models is the one of the less affected sector. Furthermore, he adds that the costs of economic cycles of fast growth and recessions, systemic risks and distress risks are not included in the studies despite also having a welfare cost.

The excessive use of debt as a financing source is significantly correlated with a higher risk of financial crisis (Bianchi 2010). The real costs of that risk and the resulting acceleration of the economic cycles is hard to evaluate and to my knowledge has not been proven yet. Furthermore, due to the "2013 IMF Fiscal Monitor" of October, it is now believed that countries with a highly leveraged banking sector could have reduced the impact of the crisis by implementing measures reducing the debt bias.

iii. The cost of Tax Planning

Another very important cost resulting partly from the tax-induced bias are the arbitrage opportunities for MNEs. They can move money inside the group and between the countries to reduce the overall tax expenditure. In the context of the tax bias, they have two instruments enabling them to elude taxation: the hybrid financing instruments described *supra* and the most interesting one, the profit shifting using debts.

Between 1993 and 2004, Huizinga et al. (2008) carried out a research in thirty-two European countries to show evidences of a link between debt level of a group entity and corporate tax rate of a country. They concluded that an increase of 10% in a country's corporate tax rate leads to an increase of 1.8% of the leverage of a MNE in that particular country. They also proved the existence of debt transfers from countries with a low tax rate to countries with a higher tax rate. As an example, in their studies they chose two entities of the same company with very similar characteristics but located in two different countries with comparable tax systems. They noticed that a simulated increase of 10% of

the corporate tax rate in one country, with every other parameter remaining constant, would result in a modification of the debt level of both entities. The one located in the country proceeding to the tax rate increase would see its leverage ratio increase by 2.4%, due to the increased benefits of the tax shield. While the entity located in the country where the tax rate remains unchanged would see its leveraged ratio diminished by 0.6%. The impact of this debt-transfer phenomenon is huge for member states. In their paper, Haulotte and Valenduc (2009) estimate the total negative effect as a cost reducing the total welfare. The cost would be at least 0.25% of the GDP mainly explained by a large extent in the loss of revenues for governments.

The opportunity for MNEs to use those arbitrage opportunities raises some very important issues for tax collectors. The first one is the reduced amount of collected money due to the overall reduction of the tax burden of the company. It also implies an increased cost for national administration due to higher administration and compliance costs. (De Mooij 2011). Finally, as MNEs have the opportunity to benefit from tax optimization unlike domestic companies cannot, the debt bias creates a discrimination between local and global companies. The resulting competitive advantage can help the low-taxed MNEs to gain market shares, forcing domestic competitors who pay taxes to go bankrupt thereby depleting domestic economy and undermining state revenues. (Factica 2012)

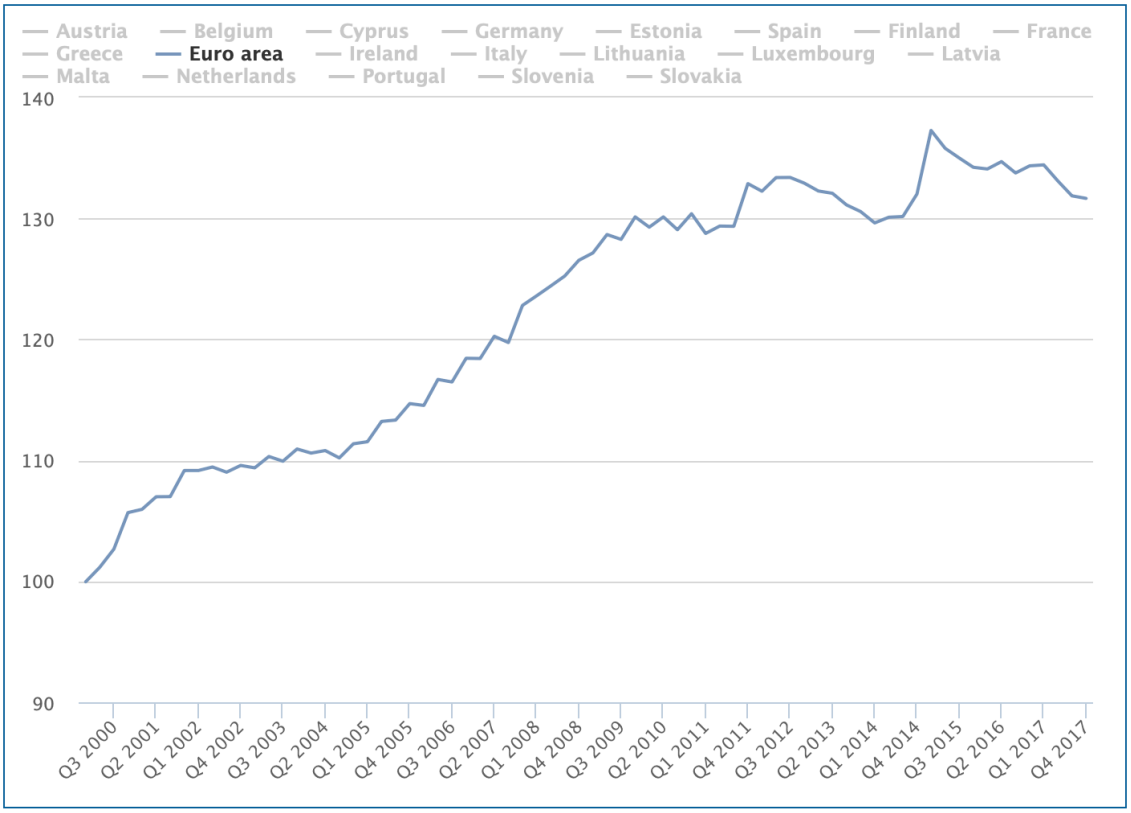
As we can see, in the recent years many studies have been trying to investigate the debt bias in our corporate taxation systems and the resulting opportunities for MNEs. Even if it's hardly quantifiable, they all reach the same conclusion, namely that there are negative effects on the domestic economies but also on global welfare. It shows the importance of considering the issue of tax induced bias and the potential benefits of equalizing the treatments of debt and equity financing.

iv. European Overview

In this subsection, we will have a look at the issue of over-leveraged companies and the induced risks in Europe. I will try to determine the scale of the phenomenon and the possible consequences.

In the following graph, we can observe that there has been a sharp increase in the debt-to-GDP ratio since 2000 for European companies. After 2008 we can notice a short stagnation, the ratio has been increasing due probably to the European Central Bank policies. The low interest rates and the large amount of cash injected into the economy made borrowing cheap and enticed companies to use debt. That availability of cash also pushed market capitalization to a new eight. As market capitalization is an element of the corporate equity, the larger amount of equity has also contributed to the increased debt ratio. But such level of indebtedness raises concerns about the long-term sustainability of European companies. If we compare the 2008 level with the impact of the global downturn on our companies, with the level of 2017 it is legitimate to fear the scale of distress our companies would face if a new global crisis were to unfold.

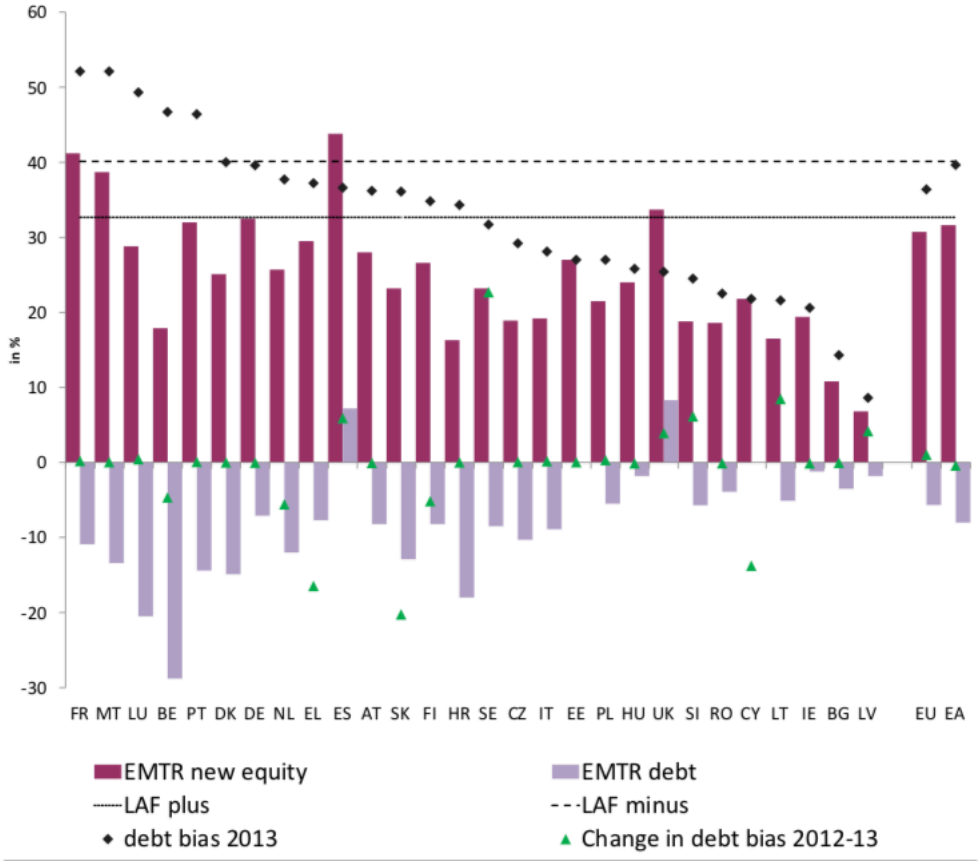
Graph 1: *Evolution of the Debt-to-GDP ratio for European Companies between 2000 and 2017 (Base 100 = Q3 2000)*



Source: European Commission (2018)

The European authorities are also aware of the existence of an equity – debt bias. In the taxation paper of 2015, Nicodème measured the debt bias for Member States. The measure used was the Effective Marginal Tax Rate for new investment funded with equity of debt. The main driver of the measure is the Statutory Corporate Tax Rate of a country. The chart confirms what I previously suggested in this paper, the higher the statutory tax rate, the higher the debt bias. The model used takes into account special regimes enforced by the government such as the ACE system in Belgium and Italy. However, it doesn't take in account the thin-capitalization rules or deductibility limits of interests linked to a company's profits.

Graph 2: *Comparison of the debt-equity discrimination and the debt bias level between European Countries using the Effective Marginal Tax Rate in 2013.*

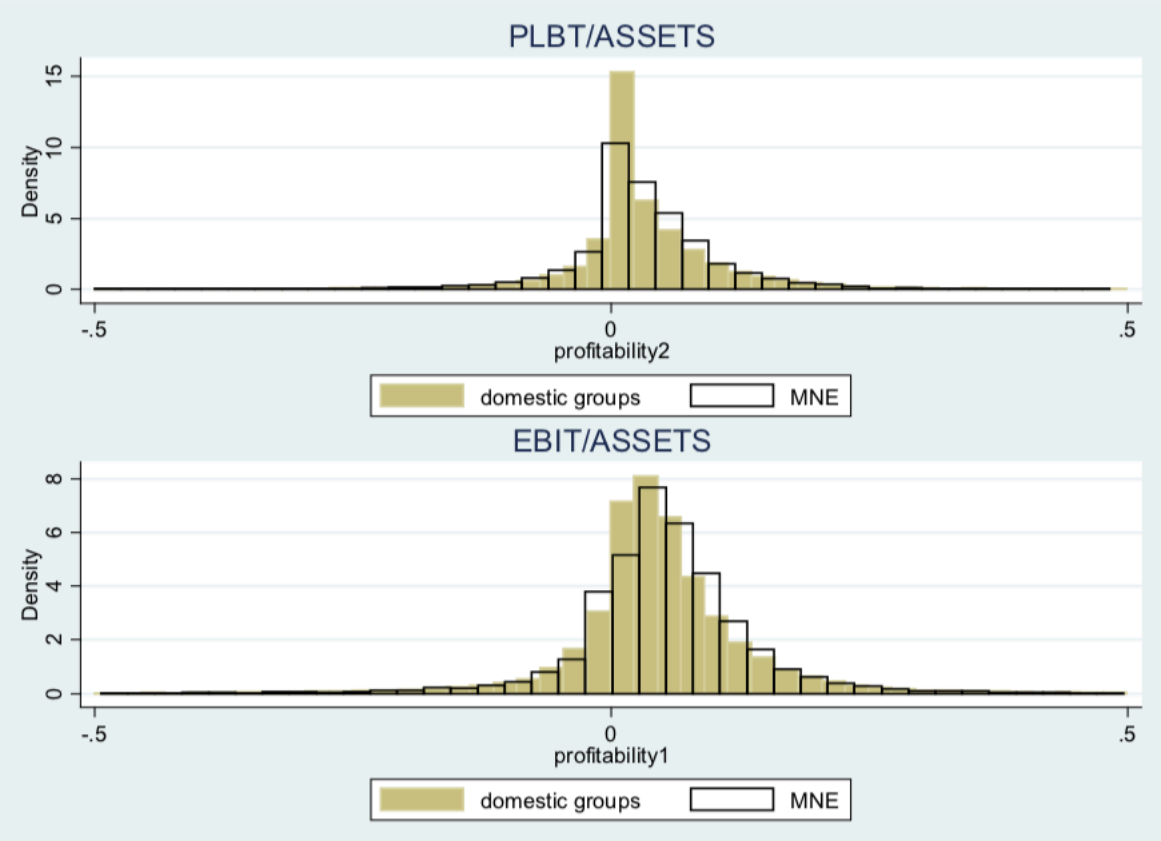


Source: ZEW (2014)

This bar chat shows that Belgium is one of the countries with one of the highest debt bias. But as Nicodème explained in the paper, the study considers only one type of ACE system with a notional interest common to all countries, which doesn't fit with the Belgian one. With the right interest rate for Belgium, he assumed the Belgian debt bias would be much lower placing Belgium behind Germany and France for example. However, we can clearly note a huge discrimination between debt and equity with the Effective Marginal Tax Rate. In every country, the tax burden on equity is much higher than the cost of debts and the debt bias resulting leads to the armful consequences exposed previously.

The appendix 2 lists all the effective tax rates established by country in the EU for SMES and MNEs between 2010-2015. Multinational companies are subject to a higher ETR overall, and therefore should pay a larger share of their profits as taxes. It can be explained by the fact that many large companies are located in large countries such as Germany and France. Those countries tend to have a heavier corporate tax burden on those companies mainly because their domestic market is hardly too avoidable.

Graph 3: *Distribution of European MNE and domestic group based on profitability (2010 – 2015)*



Source: European Commission Taxation Papers (2017)

This graph, included in the taxation papers on aggressive tax planning indicators, gives us some evidences of the reduction of the ETR by MNEs by using financial costs. The first graph is the distribution of the Profit and Loss Before Tax (PLBT) for domestic companies and MNEs. Both distributions are centered around 0, it shows that the profitability based on the PBLT of domestic companies and MNEs are equivalent. The second graph illustrates the profitability of domestic and MNEs in term of EBIT. The distribution of the domestic companies is still centered around 0, but the distribution for MNEs moved slightly on the right. The two graphs indicate a slightly higher profitability for MNEs, which confirms the assumptions that they have higher financial costs. Those costs, partly resulting profit shifting through debt vehicles, reduce the corporate tax base pushing down the ETR on MNEs profits.

European leaders, based on previous studies, are aware of the existence of a debt bias and a trend of over leveraging companies. The European High Level Group report to the European Leaders on the strategy to be conducted to improve employment and sustain growth in Europe is clear about the necessity of more equity financing.

"The limited availability of finance is a second obstacle to setting up and developing businesses in Europe. Company financing in Europe is currently too lending based and not enough risk capital based. This makes it especially hard for start-ups and SMEs to attract sufficient financing, as they cannot meet the demands for guarantees by traditional financial institutions. It is safe to say that the environment for risk capital investments still needs to be improved."

This abstract shows some of the crucial implications of the debt bias in the real economy. Europe is aware that if it wants to recover and improve its economic performance, it must address this issue. Based on those conclusions, European leaders and National leaders have been trying to enforce several policies in order to tackle the problem. The next subsection is dedicated to those correction measures and also developing how ,theoretically, the ACE enforcement is vowed to close the gap between debt and equity financing.

3.3. Correction policies

The lawmakers have tried to tackles those kind of new financing structures by enabling tax authorities to requalify excessive debt payments as dividends, therefore applying the relevant taxation on it. Some of those conditions are:

- The interest rate of the loan is much higher than the market rate without rational reasons.
- The amount of the down payment exceeds the sum of the taxed reserves at the beginning of the taxable period and the company's paid-up capital at the end of that period.

Meanwhile, those conditions, in particular the first one, are based on subjective criteria. A company can invoke many elements to justify a higher interest rate on a loan, so the rule is too complex for enforcing by the tax administration.
Some other policies tried to address the issues resulting from bias, such as the “thin-capitalization rules” or the “earnings stripping rules” enforced by some member States. But to reach tax neutrality between debt and equity, Mourre (2014) will suggest in the European Tax Commission report two measures to facilitate the transition: one is to limit the deductibility of interests (CBIT), the second one is the reduce the cost of Equity (ACE).

i. CBIT: Comprehensive business income tax

To reduce the fiscal discrimination between debt and equity, Mooij and Devreux (2008) suggested two options: We can reduce the cost of equity, which may result in a reduction of the fiscal revenues of governments. Or we can increase the cost of debt by reducing the favorable tax treatment induced by the classification of debt expenses as deductible costs. The reduction of the cost of equity will be discussed in the following point treating of the ACE. In this section, I will develop the concept of reduction of the deductibility of interest payments with the CBIT rule.

The CBIT has been created by the US Treasury in 1992 and aims at eliminating the favorable treatment of debt financed investments by disallowing the deduction from the taxable profits of the interest payments as costs.
The organization of the system is very complex, as is it changing many long standing fiscal rules. In the US Treasury proposition, they do the distinction between CBIT companies and non-CBIT companies (like small firms). The same apply to financial companies and banks. The interests received from a CBIT firm or bank by another CBIT firm or bank will be exempted or deductible. However, interests received by a CBIT company from a non-CBIT company will be subject to taxation. For example, if a bank receives interests from households or government bonds, it will be taxed as households and the government are non-CBIT agents. About foreign interests received by national companies, it will depend on the treaties with each country if the interests will be taxed or not.

The CBIT system turns corporate income tax into a global company-wide tax on capital. All capital returns will be taxed at the source. This measure broadens the taxable base to currently exempted types of capital income, such as capital income earned by institutional investors. As interest payments would be taxed, and the taxable base broaden, the US Treasury added a proposition to abolish the personal income tax to avoid double taxation on capital incomes like dividends, but we will not develop that aspect here.
The CBIT has for consequence to raise the cost of capital on debt-financed investments. It is increasing the ETR on interests and therefore, reduces the discrimination between debt and equity. It might result in a decline in the number of investments. The projects profitable at the margin before the CBIT will not be profitable anymore. Under that aspect, the CBIT is at the opposite of the ACE as I will show in the next subsection.
However, the final outcome on investments and corporate tax revenues is ambiguous. If a government decides to enforce the CBIT without changing the personal tax regime, the broadening of the tax base will result in higher corporate tax revenues. It will enable the government, for the same amount of revenues, to reduce the corporate tax rate. It reduces the cost of equity and may attract new economic rents or investments.
Sorensen (2007) emphasis that effect. He notes that the cost of capital on low-yielding debt-financed investments will rise, as explained *supra*, but highly profitable equity-financed investments will be taxed lighter and will expend. Bond (2000) estimates that

the benefits from the lower corporate tax rates resulting from the CBIT are likely to outweigh the increased cost of capital.

Table1: *Expected impact of CBIT on Decision margins*

Effects of CBIT on distortions in	
- Capital structure	Neutralised
- Marginal investments	Exacerbated
- Tax planning via intragroup financial structure	Reduced debt finance in CBIT country
Effects of corporate tax rate reduction on	
- Investment by credit constrained firms	Increased investment
- Discrete location of profitable investment	Increased investment
- Tax planning via transfer pricing	Reduced outflow – increased inflow of profits

Source: De Mooij & Devreux (2008)

ii. ACE: Allowance for Corporate Equity

The Allowance for Corporate Equity was first proposed by Devreux and Freeman (1991) as a tool to address the debt bias. They suggested to equalize the cost of debt and the cost of equity by granting companies a deduction proportional to a notional interest applied equity without removing the deductibility of interests' expenditures. The tax cut on equity return would be proportional to the amount of money saved with the Tax Shield. The key here is to make sure the notional interest rate of the deduction for equity is equal to the interest rate for debt. It makes shareholders indifferent between debt or equity financing as the corporate tax will only affect the share of return on equity above the market rate. The ACE systems can be different in their calculation methods or in the choice of the reference for the debt rate. Indeed, the real interest rate on debt will vary from company to company depending on the perceived risks and the premiums resulting from those risks. According to Fane (1987) the notional interest rate should be equal to the risk free interest rate on debt, often given by the rate on state bonds, to be equal to the tax advantages of debt that are certain.

Under the hypothesis that the selected notional interest rate is accurate, the ACE has some very interesting properties:

- Regarding tax-induced bias, companies will be indifferent between debt or equity financing as the ACE system neutralizes the bias.

- Differentiation between the national depreciation rules, which are part of the fiscal competition between state members, would become irrelevant under the ACE regime. The variations between the depreciation rates would be compensated by the variations in the ACE. A fast depreciation in the early years would save money in the short term but those savings would be offset be the reduction of the stock of equity and therefore the reduction of the ACE the following years. (Jacobs 1997)

- The ACE is also neutral regarding the investment decision making. As any investment profitable without taxes remain profitable under the corporate tax system. If an investment has a return equal to the marginal interest rate, the profits will equal the ACE deduction and the return will not be lowered. (Klemm 2005) The EU Commission (2015) argue that implementing an ACE could favor investment in countries coming from a traditional tax system.

- The ACE system does not need regular adjustment to fit with inflation. The amount of deduction, based on the total profits, will automatically increase at the same rate as the inflation rate. (Klemm 2015)

However, those upsides must not overshadow some negative aspects described by analysts of the ACE regime. Indeed, without drawbacks, it would be difficult to understand why such a small number of countries implemented that system. We have two main reasons why governments are reluctant to enforce ACE:

- To be neutral for the State revenues, implementing an ACE needs to be paired with an increase in the corporate tax rate. Indeed, if the tax base is narrowed, the rate of corporate tax on it must be higher to collect the same amount of revenues. But due to the tax competition between European countries, increasing the corporate tax rate, even if combined with an ACE, could be harmful in term of attractiveness and result in a negative impact on the national economy. Profitable investments could be relocated

as the benefit from the ACE is not high enough to balance the cost of the increased corporate tax.

- The European Commission is fighting hard to reduce tax competition between State members by creating a uniformed fiscal landscape, which implies removing unfair fiscal incentives. A country enforcing an ACE on its own could be badly seen by other State members and the EU authorities.

- The cost of an ACE can be substantial in the short-run if the notional deduction is applied to both new and existing capital. A government enforcing the regime have to pay attention to the amount of lost corporate tax revenues to avoid budgetary distress.

The ACE can also be seen as a fiscal stabilization tool for national economies to edge away from downturns and systemic crisis. As it tries to equalize the cost of debt and the cost of equity, the ACE represents an incentive against over-leveraging companies as it reduces the advantages of the tax shield. It pushes companies to keep more capital as reserves to benefit from the ACE and as a consequence build buffers to edge against risks. By having stronger balance sheets, companies would be less likely to go bankrupt and in order to keep benefiting from the tax savings, they would be less prone to relocating, preserving employment, investments and stability.

Table 2: *Expected impact of ACE on Decision margins*

Effects of ACE on distortions in	
- Capital structure	Neutralised
- Marginal investments	Neutralised
- Fiscal depreciation	Neutralised
- Tax planning via intragroup financial structure	Increased equity finance in ACE country
Effects of corporate tax rate increase on	
- Investment by credit constrained firms	Reduced investment
- Discrete location of profitable investment	Reduced investment
- Tax planning via transfer pricing	Outflow of profits

Source: De Mooij & Devreux (2008)

As we can see, the ACE seems to have very interesting upsides if it fits well with the characteristics of the national economy. This is why, the ACE systems implemented in different countries have been very different in the way they were built. Those differences, from the choice of the reference interest rate to the calculation method of the deductible equity, were the consequences of political and economic choices. They resulted in more or less successful implementations of the ACE.

3.4. The Belgian Case

In the previous section of this paper, we showed that, in a particular tax system, there is a bias in the decision-making process of either using debt financing or equity financing. This distortion has led some companies to over-leverage their balance sheet to finance new projects and benefit from the tax shield.

In this section, I will start by developing the case of Belgium. I will demonstrate how, in our tax system, we also push companies to finance their investments using debt thanks to the fiscal laws in place based on the model King and Stiglitz have used. In a second time, we will try to understand the reasons for trying to correct the discrimination between financing sources. I will describe and compare with our benchmark the successive measures enforced by the governments to tend to the neutrality. Finally, I will search for the official and non-official reasons of the introduction of the Allowance for Capital Equity in the shape we know in Belgium, before discussing the impact and effectivity of the first introduction of the ACE.

i. The King-Stiglitz Model

In this section, we will try to build a reference framework to evaluate the different evolutions in the Belgian tax system since 1960. Based on this reference, I will discuss some important measures that were taken back then and assess their contribution, positive or negative, to the neutrality and efficiency of the tax system regarding the financing sources.

The first step to build the model is to confirm, whether or not, the Belgian fiscal regime is similar enough to the US fiscal regime Stiglitz and King used. Stiglitz listed four major

features relevant for his purpose, and we will see if those four features also exist in Belgium.

(1) Dividends (apart from exceptions) are tax at the same rate as the personal income.

In Belgium, dividends are considered as personal revenues for the one who receives them. It means that someone who possesses some shares in a company, if the very company distributes dividends, he will have to pay a 25% tax rate on the money received. There are some exceptions to that general rule, such as the exoneration of the first 804 euros perceived, but those are minor and we can consider the Belgian regime equal the US regime on that aspect.

(2) Capital gains are taxed at ½ the rate for dividends and are taxed only at realization.

In Belgium, capital gains also benefit from a favorable regime, much more than in the US. Indeed, capital gains in the Stiglitz-King model are taxed at half the rate of the dividends, whereas in Belgium capital gains are fully exempted from taxation. This is why Belgium is sometimes qualified as tax heaven, as companies can use this to optimize payments to shareholders by turning what should have been dividends into capital gains to evade the tax burden. However, there are some exceptions. For example, if a transaction is seen as speculative, with a very short period between the buying and the selling with an increase in the value of the shares, the fiscal administration can decide to tax the profit as personal income or corporate profit depending on who did the transaction. As in the US, profits are subject to tax or exemptions only when they are realized.

Even if the conditions are more extreme in Belgium, the underlying principles are the same. The tax burden is on the dividends but capital gains are partly or fully exempted.

(3) Bond interest payments are considered as personal income and must be taxed accordingly.

This hypothesis also holds in Belgium. Indeed, interests paid on a debt will be considered as a revenue for the lender. Whether it is a company or a private investor, the interest payment will be taxed. In the case of a company, the amounts

perceived will be a financial revenue and will be taxed as a net profit at the corporate tax rate. If it is a private investor, the payments will be considered as personal revenues and will be taxed at the relevant tax rate on personal income.

(4) Interests payments are not included in the corporate tax base subject to the corporate profits tax.

As in the US, interests are paid as a cost and do not enter into the composition of the net profit, so in the corporate tax base. Unlike dividends, they avoid double economic taxation as they are only subject to personal income taxes but not to corporate profits taxes.

(5) Other Parameters

Stiglitz also suggests some other features to understand the impact of taxation on corporate behavior. For example, the ability to offset capital losses within a year or to partly carry the loss over and back in time. We will not go into the exhaustive details of the Belgian regime on the topic, but we can state that it is similar enough to support the Stiglitz-King's model.

As shown, the Belgian tax regime is very similar in its principles to the one Stiglitz and King relied on to demonstrate their theories. We use this model as a reference and evaluate some of the main measures enforced by successive governments in Belgium. To assess their impact on neutrality, we will use the concept of "Effective Tax Rate".

In this paper, I will use the definition of Effective Tax Rate made by Vallenduc and Halleux (2007) in their paper "Effective tax rate and the size of the company in Belgium an empirical investigation on micro-data". They define the ETR as the Corporate income tax liability (CITL) divided by the taxable profits that should appear under a benchmark tax system with no tax expenditures. By tax expenditure, they mean all the fiscal incentives that represent a cost for the Belgian authorities.

They translate the definition in the following equitation:

$$ETR = CITL / (NTB + Ate – DC)$$

With:

- NTB = Net tax base
- Ate = allowances that are considered as tax expenditures.
- DC* = disregarded charges, excluding CIT.

All the tax credits, including the notional ones, are deducted from the CITL as they reduce the overall tax burden. For the computation of the denominator, they start from the net taxable profits. They add to it all the allowances and exemptions considered as tax expenditures (For example, the tax that should have been paid on exempted revenues). Finally, they subtracted the disregarded charges that should be deduced according to accounting standards. They provide some examples:

- Any extra-cost deduction that is considered as a tax expenditure (an investment allowance for example) will be added to the denominator and will reduce the effective tax burden as recorded by the ETR.
- Any allowance that is not considered as a tax expenditure (the participation exemption aiming at preventing double taxation, or losses carried forward) will not affect the ETR.
- The non-deductibility of expenses will increase the effective tax rate.

We should add some precisions about the ETR definition. Some provisions, such as the deduction for losses carried forward, the exemptions of revenues from branches under treaties regimes or the participation exemptions are not included in the tax expenditures in the ETR formula. But we know that such provisions will reduce the CITL and therefore reduce the ETR. We should also add preferential regimes, like coordination centers, to the tax expenditures lowering the ETR.

Finally, I must add an important feature to the definition of the ETR to use it in my paper. To include the discrimination between debt financing and equity financing as a factor reducing the ETR, the net tax base should also include the interests paid on debts together with the ones exempted from corporate profit taxes. As they are a return for debt

investors, they should be considered as a return exempted from taxes. The bigger the share of the EBIT distributed as interests, the smaller the corporate income tax liability is. So, the more a company uses debt, the more it reduces its ETR.
This definition of the ETR will be, with the Stiglitz-King model, the starting point of our assessment of the evolution of the discrimination between equity and debt in Belgium. It will provide a benchmark from which I will discuss the impact of the main tax regimes enforced in Belgium and see if they tend to increase or lower the discrimination between debt and equity.

ii. The "Arrêté Royal of 1982"

This package of fiscal measures was suggested by Senator Coorman and the minister of finance De Clercq at a time of an economic downturn. The Belgian economy was slowing down and companies were facing increasing difficulties to gain an access to financing. Due to the gloomy context and the confidence crisis, banks were reluctant to lend money and investors were withdrawing their money from the stock market. The Brussels Stock exchange was in bad shape and some companies were facing serious financial distress due to a huge devaluation of their shares.
The Belgian government decided in 1982 to figure out a way for Belgian companies to have a better access to financing. They did so in order to give an impulse to the Belgian economy, hoping those investments would bring confidence back on the market and restart a positive loop for employment, investment and growth.
The chosen measures were inspired from the French model created a few years earlier. The government decided to help companies by facilitating the access to equity financing. The government decided to bring investors back on the stock market by allowing tax exemptions on investments in Belgian companies, or investment funds with a majority stake of Belgian stocks.
The first 40,000 Belgian Francs (Around 1,000 euros) invested in Belgian companies or investment funds with at least 60% of Belgian stocks were exempted from the taxes. Those 40,000 Belgian Francs were deducted from the taxable revenues of private investors. Furthermore, companies were allowed to issue new stocks with a reduced tax rate on dividends.

Before the enforcement of the new regime, we showed that the Belgian tax system was very similar to the basic model of Stiglitz-King with the discrimination between debt financing and equity financing. Due to the economic context described *supra,* the government had two option to boost investments. The first one was to help companies secure financing with an easier access to debt, but any measure would probably have failed, as the banking sector was very reluctant to lending money at that time. Furthermore, the government was concerned about the poor performance of the Belgian Stock Market, increasing the urge to bring investors back. So the chosen solution was to reduce the cost of equity financing for both companies and private investors. But why did it reduce the cost of equity?

To answer that question, I will use the ETR and the definition we made of it previously and I will have a look at both the point of view of the private investor and the company.
The deductibility of the 40,000 Belgian Francs means that the private investor will pay personal income taxes on the total of his revenues (dividends and interests perceived included) diminished by the 40,000 Belgian Francs. So, the money gained by investing in companies is less heavily taxed, but only if that money is invested in Belgian equities. Therefore, only the revenues from equity investments are benefiting a reduced personal income tax rate. So private investors have huge upsides to investing their savings in Belgian Stocks.

Let's have a look at impact on the cost of debt and equity financing on the company side. As previously discussed in this paper, the dividends are subject to a double economic taxation. Where debt only imply a personal income tax for investors, dividends are taxed by corporate income tax and by the personal income tax. The exemption for private investors reduces this bias, by reducing the private income tax on the dividends perceived from Belgian companies. This is the first incentive for private investors to buy equity and provide cheaper equity financing. Private investors look for lower returns on their investments than previously, thanks to lower taxes.
Furthermore, companies can issue shares with a preferential tax rate, the AFVs ("Avantage fiscal voordeel"). Companies increasing their capital were allowed to issue new shares with a lower tax rate on dividends. This measure was not directly affecting the ETR, but it was another incentive for private investors to invest, as it reduced the tax burden on dividends.

Compared to the initial model Stiglitz-King used, the actions of the Belgian government helped to reduce the bias between debt and equity financing. By granting exemptions for returns on Belgian companies' equity and by creating shares with less taxed dividends, the government reducing the personal income tax on dividends. Therefore, it reduced the impact of the double economic taxation on those dividends, which is a main contributor to the fiscal discrimination between debt and equity.

Those two measures, both contributing to a reduction of the overall tax burden on dividends, and therefore on the returns from equity investments, contributed to reduce the cost of equity investments for private investors. For the same amount of after-tax money, they were demanding lower return on equity. Those lower expected returns implied a reduced cost of equity financing for companies. It was an incentive to use equity over debt to finance new projects and a first attempt at trying to tighten the debt-equity bias.

iii. The Withholding Tax on Dividends

A second very interesting measure enforced by the Belgian government was the separation between the global revenues of households, which represents the taxable base of households, and revenues from interests and dividends. In 1984, they created the "précompte mobilier libératoire" (PML) on interests and dividends. This system, which we will name PML, modifies the tax base for the personal income tax. Previously, interest revenues and dividend revenues were included in the global income of households, and were part of the taxable base. Therefore, they were taxed at the same rate as all revenues from the households, that's to say; at the personal income rate.

With the PNL system, the interests and dividend revenues are now excluded from the global taxable base. They are taxed at a fix rate depending on the revenue and are collected by the company distributing dividends or interests. Once the PML has been paid on the eligible revenues, they are exempted from personal income taxes and shouldn't even have to be declared to the administration.

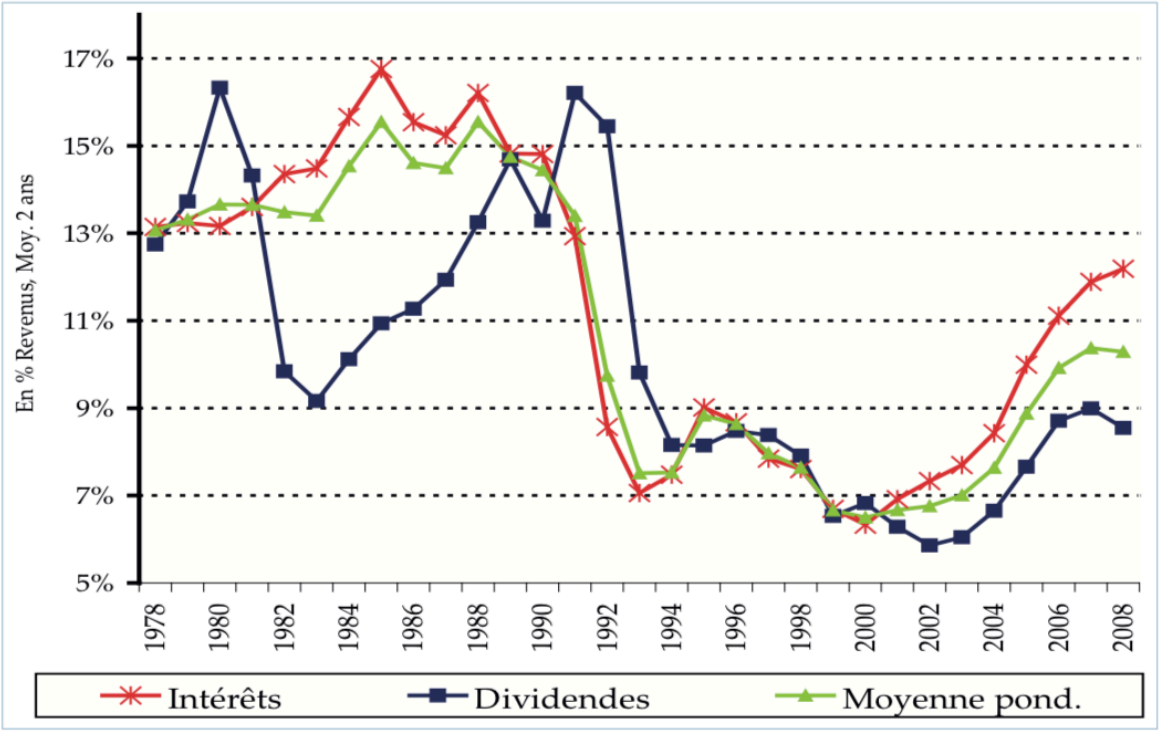
The tax collector has the ability to tax those revenues at different rates, creating a mechanism that could enable him to use those rates to correct the tax-induced bias between debt and equity financing. The PML tax rate on interests and dividends was around 20% in 1983.The graph number four shows the effective tax rate on dividends and interests when perceived by households. The effective rates are much lower than expected

for two reasons. The first one, common to both interests and dividends, are the legal structures, mostly international ones using the legal voids to avoid taxation. The second one, that explains why dividends were less taxed during the 80's, are the many incentives offered by the government to stimulate the economy by reducing the cost of equity for private investors and companies.

However, when we have a look at the Weighted Average Rate (The green line), it is much closer to the effective tax rate on interests than the effective tax rate on dividends. It means that even if the withdrawing effective tax rate on equity is much smaller than the effective withdrawing tax rate on dividends, much more revenues are coming from interests. Despite preferential rates for equity investments, private investors are much more eager to lend money to companies, by their own means or through banks, than to invest into equity.

This can probably be explained by the fact that a reduced withdrawing tax rate on dividends does not eliminate the economic double taxation of dividends.

Graph 4: *Effective Households Withdrawing Tax Rate on Interest and Dividends from 1978 to 2008. (As a percentage of the mean revenues over 2 years)*



Source: NBB (2008)

If we look at the measure on the Stiglitz-King initial model, it affects the first condition of the model, the dividends are taxed at the same rate as the personal income. By creating a new regime, excluding the dividends from the personal income tax base in order to tax it separately, the government leaves the door open for more opportunities to reduce the tax induced bias. It doesn't suppress the double economic taxation of dividends, but it provides a first set of tools to correct the resulting negative effects. It reduces the gap at the investor level which has indirectly an effect on the returns expected from debt and equity, and therefore the cost of debt and equity.

iv. The Coordination Center Regime

We can, without the shadow of a doubt, apply the Stiglitz-King model to the Belgian case, despite some isolated measures aiming at correcting the discrimination of equity. As a consequence, we should have highly-leveraged balance sheets for most companies. Nevertheless, most MNEs active in Belgium had huge amounts of equity in their balance sheets and high leverage ratios. It is interesting to have a closer look at that paradox in order to understand all the parameters that led the lawmakers to opt for the ACE system in the shape as we knew it before the 2018 revision. We need to take a moment to come back to the history of the corporate tax regime that preceded the ACE system enforcement in order to understand what was at stake. How the law makers managed to smooth the transition between the old and the new tax system.

Since 1982 and the "arrêté royal n° 187 du 30 décembre 1982", Belgium has offered very appealing tax cuts for profits put in a reserve and for profits distributed as dividends in order to attract foreign capitals. With this new regime, MNEs were authorized to establish small offices in Belgium, named "coordination centers". Their roles were to provide a variety of services to the different entities of the group. They could exclusively provide those services to the group, they cannot work for other clients. Companies obtained the coordination center status through renewable ten-years authorization obtained after negotiations with the Belgian authority. We have to lay emphasis on the criteria that have to met in order be authorized to establish a coordination center, as they can only be

fulfilled by large companies and MNEs. To be eligible to establish a coordination center a company has to:

- Employ at least 10 people in Belgium
- Have operations in at least four different countries.
- Have a total turnover of minimum 240,000,000 €.
- The consolidated capital and reserves worth more than 24,000,000 €.

The services provided to the group could be very diverse such as currency edging, marketing, insurance, lobbying, information gathering and analysis. But in reality their main function was to be the financial center of the group. They were often called "the group bank" because many internal financial transactions, loans, transfers are operated by the coordination centers. The objective for the MNEs was to build up a financing structure such as the coordination center lent money to the other entities to finance their investments in the first time. And in the second time, those entities highly in debt paid back to the coordination center interests that sometimes count for up to the complete entity profits. Those internal loans, enabled the group to shift profits from highly taxed countries to coordination centers as interest payments not subject to corporate taxes. The fiscal regime applied to the coordination centers was very favorable for equity investors. Among the most significant advantages we had:

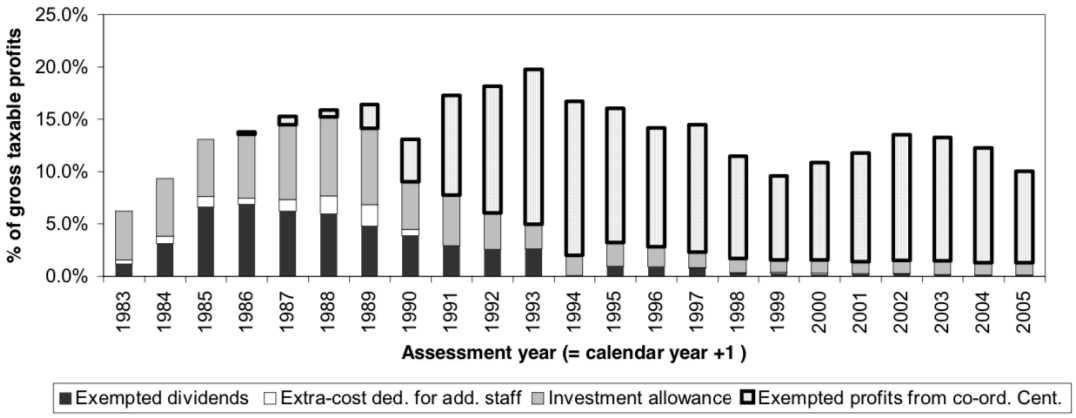
- No corporate taxes on dividends distributed to investors. They are exempted from paying the withdrawing tax on distributed profits.
- No taxes on the interests paid to other entities in the group and no taxes on interests paid by other entities to the coordination center.
- No registration rights, no property tax.

The role of the coordination centers was then to turn interest profits, collected from the loans to the foreign group entities, into capital return through dividends or shares buybacks. Such structure enabled MNEs to be taxed at a very low effective tax rate. Indeed, the ETR as defined previously is very low, thanks to the reduction of the Corporate Income Tax Liability. All the exemptions allowed and the nature of the coordination centers purposes enable companies to considerably reduce their corporate tax burden.

As a consequence, the coordination centers were heavily financed, mostly with equity, distributing heavy dividends and had a very high capital to asset ratios.

In 2003, more than 250 companies had settled coordination centers in Belgium in order to concentrate their revenues from other countries before keeping them as reserves or distributing them as equity returns to the shareholders. This legal regime explains why in Belgium we have two important aspects to take into account in the analysis of the ACE system. The first one is that most of the companies in the country tend to over leverage their balance sheet to benefit from the tax shield and the second one is that a small number of very large players have huge amount of capital in the form of equity in the country to benefit from the coordination center regime.

Graph 5: *Tax expenditures – Corporate income Taxes – Deduction from the tax base from 1983 to 2005.*



Source: Belgian Ministry of Finances

The graph number 5 shows the importance of the successive tax expenditures and incentives in Belgium. At first, the exemption on dividends was the main contributor as tax expenditure. Secondly, the coordination centers regime became more and more important to finally be the main tax expenditure for the government. It was the main tax incentive used in Belgium to attract foreign companies and investors. Unlike the reduced tax rate on dividends, the coordination center regime was only profitable for large MNEs able to build substantial fiscal structures to make the best of the regime.

In that context, it is legitimate to wonder why Belgium decided to remove the coordination centers regime to introduce a general one in the form of an Allowance for Corporate Equity. We could also wonder why the ACE regime in Belgium is slightly different in its construction from what is described in the literature and applied in countries such as Italy or Portugal.

v. Termination Coordination Center Regime

There are several parameters to take into account to answer the question. The first one is to look into the new fiscal landscape the European Union is trying to build and the rules that have been progressively applied to ensure the integrity of the common market since the creation of the Union. The second one is linked to the cost and the bad reputation of the measure on the national level.

a. The European blame

The need for reformation of the coordination centers regime became more and more urgent as the European Commission was trying to build a more and more integrated single market. It means among other things reducing tax competitions between countries and remove barriers to free movement of capital.

The Commission has been aware of the coordination center for a long time. In 1984 and 1987 it authorized Belgium to keep this regime in its tax code. Following the adoption of the Code of conduct for business taxation aiming at tackling damaging fiscal completion, the European Council requested the Commission to review some fiscal regimes to determine if they are considered as State subsidies. The investigation on Coordination Centers regime started in 1999 and concluded in 2003 that it consists in a State aid incompatible with the new code of conduct. As it was a regime already applied, Belgian didn't have to recover the aid. But it cannot sign the 10-year agreements anymore, which used to allow companies to settle coordination centers and the regime would last until the end of the agreement for companies currently holding one without possibilities to renew it after 2010.

b. Critics on the National stage

Other negative aspects of the coordination centers regime were the cost of the measure for public finances and the perceived feeling that Belgium was making gifts to MNEs. In 2002, the last year of public data, coordination centers in Belgium declared a total of 5.36 Billion euros in profits thanks to, in a large extent, their financial operations. The amount of tax paid on those profits was 73 Million euros, an effective tax rate of 1.36%. Some could argue that despite low fiscal revenues from those profits, they contributed to creating well paid jobs, up to 10.000 depending on the sources. On the left wing of the political landscape, the feeling of injustice of those fiscal gifts was growing and the regime was more and more criticized and seen as a gift to the wealthy. In times of economic woes, the existence of such fiscal niche was hardly defendable given that the socialist party was part of the governing coalition at that time.

The combination of those two trends urged the government to reform the fiscal incentives landscape in Belgium. In light of the push of the European Union for a more homogenous tax system between all members, many countries had to reshape their national tax regimes. Two main paradigms emerged from this evolution. In the first one, we find the countries who decided to revoke most of their tax incentives or favorable regimes and compensate the loss by cutting on the corporate tax rate. In the second one we find the countries who decided to keep their corporate tax rates untouched but maintained most of the favorable regimes by reshaping them.

This is why, in 2006, the Belgian government decided to officially implement an Allowance for Corporate Equity, in order to tackle the issues of the highly leveraged companies by equalizing the cost of debt and the cost of capital. But as we will see, the chosen characteristics of the Belgian ACE reveal some unofficial goals authorities are less prone to discuss.

vi. Belgian ACE characteristics

The Belgian ACE, named NID for *Notional interest deduction,* has been created to reduce tax discrimination between debt and equity financing and to therefore promote capital-intensive investments in Belgium. The NID is also a rule reducing the effective tax rate

for all companies and provides a higher return on investments. But the new system also aims at replacing the coordination center regime, which had to be removed after the European Commission ruling of 2003. Belgium wanted to find an internationally accepted substitute that preserves the attractiveness of Belgium.

In Belgium, the reference nominal deduction rate has been chosen to be equal to the 10-years state bonds rate and is supposed to represent the risk-free interest rate (capped at 6.5% and 0.5% higher for SMEs) . Some other particular characteristics of the original Belgian NID system needs to be considered in this paper:

- The deduction in Belgium is a permanent incentive, it does not only apply to new investments. The NID based on the aggregate net equity amount of a company at the end of the preceding fiscal year with some adjustments. For example, tax credits, R&D credits, own chares held in the balance sheet, will have to be subtracted to the total equity amount to obtain the qualifying equities. Such adjustments aim at avoid abuse of double use of tax incentives.

- The qualified investments can be either tangible or intangible assets without distinction between both.

- An important aspect is the incompleteness of the rules about transactions between entities of a same company such as internal lending and borrowing. Those rules, named *anti-avoidance provisions*, let MNEs transfer equity to their affiliate in Belgium which can in a second time lend that money to foreign entities of the group, therefore lowering the effective tax rates on profits made in other countries. It is an example of the tax arbitrage described earlier in this paper.

- During the transition period, running until 2010, companies benefiting from the coordination center regime had to choose between the two systems. They cannot cumulate both tax incentives.

As we can see, the underlying goal of the NID is mainly to offer a legal solution to MNEs to compensate to disappearance of the coordination centers. As the system is made to benefit to every company operating in Belgium, it has credit for being legal in regards to EU treaties on harmful competition and state aids, but also for reducing the competitiveness gap between MNEs and domestic companies created by the coordination center regime. It is also, by nature and as describe in the theoretical aspects of an ACE, a stabilization tool to edge against the risks of over-leveraging. However, thanks to the incomplete anti-avoidance rules and the NID calculated on the whole equity of the Belgian entity, the NID still enables MNEs to transfer profits to Belgium reduce their effective tax rate on it, just like the coordination center regime

vii. Effectiveness of the Belgian ACE

The outcome of the NID regime in Belgium has been discussed many time inside economic circles but also on the political stage. The ideological arguments have often eclipsed concrete facts and empirical researches. In this subsection, I will try to assess what was the real impact on the Belgian economy and the fiscal revenues based on concrete studies and research. I will also try to understand the reasons that led to the 2018 reform of the NID regime.

The first point of the Belgian ACE I will discuss is the objective of creating a continuity after the Coordination Center Regime. Regarding this goal, the Belgian ACE has achieved to enable companies benefiting from the favorable regime to keep a very low corporate income tax rate. Indeed, companies benefitting the most from the ACE are companies operating financing operations and therefore well capitalized. For companies that took over the operations of the coordination centers, the ETR was close to 0% according the report of the Tiberghien Law Firm (2010). In the end, the NID has reached its objective of keeping the favorable regime of the Coordination centers alive.

A second effect also linked with the effective tax rate is the overall reduction of the cost of equity in Belgium. The NID had for consequence to bring the ETR on corporate income from the nominal rate of 33,99% to 26% on average. The cost of such a reduction in term of corporate taxes revenues had first been estimated by the NBB to 2,6 Billion Euros for 2006. However, the final impact on the public budget has been less important.

Indeed, thanks to compensatory measures and an inflow of foreign capital, the final net cost was estimated between 140 and 430 million euros for 2006. Due to fiscal optimization structures and new equities, the cost raised to between 280 and 770 Million euros. The objective of neutrality for the public budget has obviously not been achieved. The effects on employment, investment and economic growth are hardly quantifiable individually. Burggraeve (2008) expected the net impact of the NID to be sensible in the mid-run, if the budgetary neutrality was respected. He estimated the net contribution of the NID to the reel economy to be an increase of 400 Million euros of gross investments in fixed assets on a 5-year period and the creation of 3000 new jobs. In 2015, Hebous demonstrated the opposite and found no clue of such effects looking at the behavior of German MNEs.

Finally, regarding the goal of improving Belgian companies' balance sheets by reducing the cost of equity financing, the results are ambivalent. The introduction of the NID resulted in a huge inflow of capital from foreign companies or entities (See Appendix 4). Princen (2011) studied the effect of the Belgian ACE on Belgian companies leverage ratio compared to French and German companies. The result is a decrease of 2% to 7% of the leverage ratio of Belgian companies due to the introduction of the ACE. Afterward, Panier (2013) also concluded to a significant increase in the share of equity used in balance sheet of Belgian companies compared to other EU countries. At first sight, the ACE seems to have achieved its objective of reducing the tax-induced bias, and the reduced leverage ratio is the consequence of that.
But when we have a closer look at the capital flows flowing the introduction of the ACE, the effects might not be as positive as expected. Two studies, conducted in 2008 by Laveren and Van Sweevelt and in 2013 by Van Caneghem and Van Campenhout, showed no significant effects of the NID on the capital structure of SMEs. This is due to the fact that companies that benefit the most of the NID are MNEs. Following the introduction of the regime, they shifted equity to Belgium to optimize the amount of the deduction. This money was afterward lent to intra-group foreign entities to bring profits back to Belgium where they were not taxed thanks to the NID. The increase of equity is therefore mainly due to tax optimization purpose and not for new investments.

The NID indeed strengthened the balance sheet of companies and reduced the fiscal discrimination of equity, mostly MNEs, but the impact of the reel economy is very minor

compared to the cost of the measure for the public budget. Due to a lack of anti-abuse measures and aggressive tax planning, the NID has been used as a fiscal optimization vehicle, gathering criticism from the political class and civil society.

viii. Second reform of the Belgian ACE

The new notional interest deduction regime is part of the 2018 reformation of the Belgian corporate tax system. The underlying principles remain unchanged, but the computation formula for the qualified amount of equity has been reviewed. Previously, the NID was based on the full amount of the prior-year net equity of the company. In a second time, that amount was multiplied by the interest rate chosen to calculate the total amount deductible from the total corporate income tax liabilities. From now on, the qualifying capital is the average of the five year increase in net equity. Once this average is determined, it is the amount used to compute the NID for the fiscal year.
This change in the computation method has huge consequences for companies with significant equity in Belgium. Thanks to low interest rates at the moment, they might not see a large impact on their overall corporate tax liabilities in Belgium at the moment. However, it makes no doubt it will have a negative impact on their cash flows in the future. Speaking in term of ETR on dividends, it is a huge hit as the corporate income tax on the cash flows used to pay the dividends will lose its main tax incentive. It will result in a higher cost of equity, increasing the debt bias.

On the other side, the Belgian government has decided to reduce gradually the corporate income tax rate from 33% to 25%. It is a clear change of paradigm for the authorities. Previously on the side of countries with high CIT rates but also with fiscal niches and incentives, Belgium now tends to be a country with less interesting incentives but with a lower CIT rate.

In the following section, I aim at finding the impact of this reform on the leverage of companies in Belgium. I will search for the measurable consequences but I will also discuss the potential impact on the capital structure, the corporate tax revenues variation and the investment. Finally, based on the Belgian experience, I will imagine the pros and cons of an ACE in a hypothetical European tax system.

4. Empirical study

4.1. Empirical methodology

To analyze the impact of the new NID regime in Belgium, I decided to inspire my methodology from the one used by Princen in the first chapter of her doctoral thesis *"Determining the impact of taxation on corporate financial decision-making"*. Due to some constraints as the time to realize the study and the access to the data, I needed to bring some modification to her model. I will detail the differences later in this section.

To assess the impact of a tax reform, the ideal situation would be a random experiment. It means in a large data base of companies a random sample would be subject to the modification of tax regime. It would enable me to leave all the observable and unobservable covariates unchanged in order to ensure they do not affect the observed variable. Only the tax regime modification would have an impact on the randomly selected regime. It also has the advantage of not creating selection bias so any outcome is favored.

In reality, a random experiment is very difficult if not impossible to create, furthermore if I we want to assess the impact of a new tax policy. Many external factors can have an impact on the variable of interest and fiscal measure often do not come alone and do not affect only a sample of the companies.

In her paper, Princen (2011) has found natural experimentation conditions as close as possible from a random assignment. She thought that if she was able to find a treatment and a control group similar enough to be compared, she could assume the existence of a natural experiment to test the effects of a tax policy. The tax policy she was trying to test (The treatment) was the introduction in 2006 of the NID regime in Belgium and she wanted to test the effectiveness of the regime. The treatment group were the companies of the country affected by the treatment and the control group were the companies in the non-experimental country. She used the difference-in-differences identification strategy. This choice was motivated by the availability of data before and after the reform. In her study, she had 1 year of post reform data available, but as she demonstrated, the effects of the reform were mostly sensible the year of the enforcement, as companies anticipate

the new regime. In my paper, the last year of data is the first year the new regime application, but as Princen showed, the effects should already be visible.

The difference-in-differences is particularly effective evaluating the effect of a new fiscal law. The method compares the changes in outcomes of the treatment and the control group over a certain period of time.

However, the utilization of this method to evaluate the impact of the new NID regime is only feasible if two key assumptions hold. The first one requires the capital structure of both groups to follow the same trends before the treatment. Indeed, to be accurate the d-in-d method requires the treatment and the control groups to follow the same trend in absence of treatment. Secondly, the two groups should present exactly the same pre-treatment characteristics. Those two assumptions ensure that the control group accurately represents the behavior of the treatment group in the absence of the tax reform, so the validity of the difference-in-difference method.

To ensure the validity conditions are met, Princen used two methods I replicated in my experiment. The first one is to match the two samples by using a propensity score method. This method will enable me to pair control companies and treatment companies that have the most similar covariates. But as the number of covariates is very large, the method consists in stratifying them. The propensity score p(X) used is proposed by Rosenbaum and Rubin (1983). It summarizes all variables into a single index. Companies with the closest index will be paired.

To define the propensity score as she did in her paper, the propensity score is a conditional probability that a firm *i,* with the features X_i, is subject to the equity tax shield ACE_i.

$$p(X) \equiv E[ACE_i|X_i] = Prob[ACE_i = 1|X_i]$$

The propensity index ensures the similarity of the pre-treatment characteristics of the two groups. To check the first validity condition, I must also analyze graphically the pre-treatment trends followed by the capital structure of the two groups over time.

For the model used, Princen set it up as follow. C_c (County) is used to define if the country is an experimental country or not (dummy variable, 1 if experimental country, 0 if not). T_t (Time) is also a dummy variable used to describe in the time period is before or after the tax reform (1 if after, 0 if before), X_{ict} is the individual control. The leverage of a

company *i* can be estimated with an Ordinary Least Squares (OLS) regression. For the difference-in-difference, Princen estimates it should have those specifications:

$$Y_{ict} = \alpha + \gamma C_c + \lambda X_{ict} + \rho C_c \,.\, T_t + \epsilon_{ict}$$

Where γ stands for the time-invariant country effects, λ are the country-invariant time effects and ρ is the casual effect of interest. ρ captures the variations in the variable observed in the treatment country after the introduction of the reform. It measures the marginal difference between pre and post treatment and determines the scale of this difference.

4.2. Data

The data I used for this model come from the ORBIS (Bureau Van Dijck) data base. It is a worldwide data base that contains economic, commercial and financial information of more than 310 million public and private companies around the globe. It centralizes the income statements and the balance sheet of those companies under a standard format to facilitate data treatment and comparisons. The data goes from 2011 to 2019. As in the Princen model, I only selected non-financial firms. The financial sector presents some specificities that makes it impossible to be included in our study. The effects of the tax reform on financial companies will not be discussed in this paper.

The selected samples are French and Belgian companies. The Belgian companies are the treatment group. The French companies will be the control group. Data from 2012 to 2017 are the pre-treatment data, the data of 2018 are the treatment data. Some company information for 2019 are already available, but there are only a few of them, that is why 2019 is not included in this experiment.

To be in line with previous capital structure literature, only companies active in the industrial sector has been selected (SIC 2000 – 5999). I also excluded companies with no employees, or no sales from the samples. The sample is composed with 18442 Belgian company-year observations and 31081 French company-year observations.

To cope with the idea of robustness of Princen, I also build a sample for Germany. This sample is made of 8430 company-year observations. The small amount observation is

due, as Princen noted, to the low level of compliance of filing national accounts in Germany.

In my study, due to time constraints and access to data restriction, I used other indicators than the one used by Princen. The data I collected are the total number of employees, the total assets (in millions of Euros), the leverage ratio as defined previously in this paper, the liquidity ratio, the solvency ratio, Tangible assets (in millions of Euros), the return on equity, the return on assets, the profit margins, the EBITDA, the inventories turnover and the total sales (in millions of Euros).

Once those data collected, is matched the two samples with the propensity score method described previously to meet the condition of validity of the difference-in differences method. The description of the variables is given in the table 3 for the year 2016.

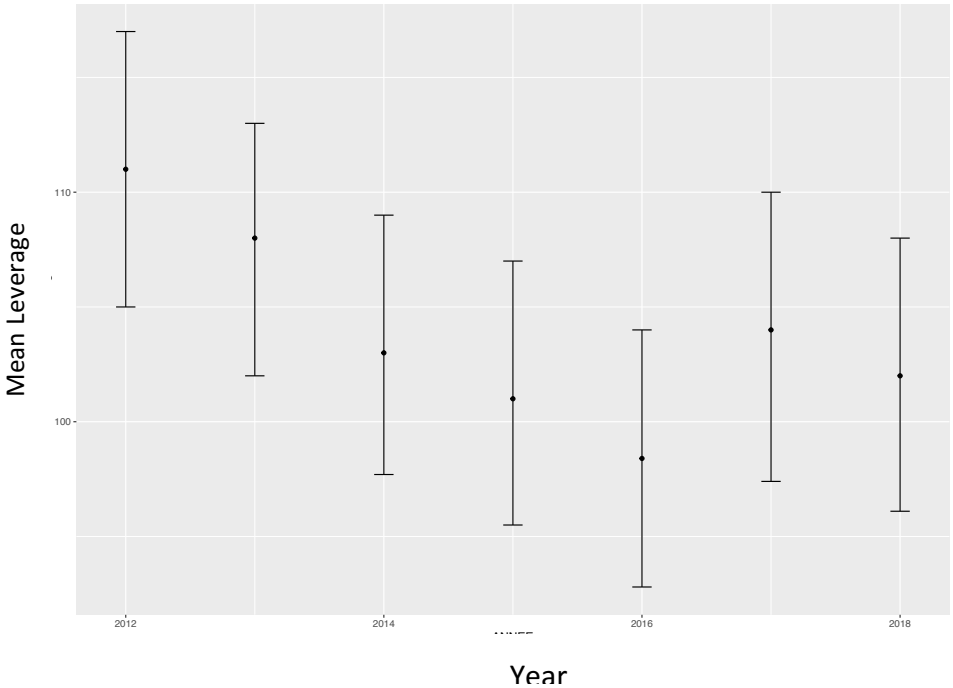
Table 3: *Descriptive Statistics of the Treatment, Control and Mixed samples*

The table presents the characteristics of the pre-treatments samples in 2006. It provides the mean and the standard deviation for the main variables used in this paper. The data are provided for the treatment group, the control group and the full sample. Employees gives the total number of employees. Total assets are given in millions of Euros. The leverage ratio is the leverage ratio as described earlier. The liquidity ratio is the amount of current debts divided by the amount of current liabilities. The solvency ratio measures the ability of the company to face its debt obligations. Tangible assets are all the tangible assets of the company in millions of euros. ROA is the Return on assets, the net income divided by the total assets. The ROE is the return on Equity, the net income divided by the total equity. Profits margins are the margins on total sales. The EBITDA is given in millions of euros. Inventories turnover are the turnover of the year. Sales are the total sales of the year given in millions.

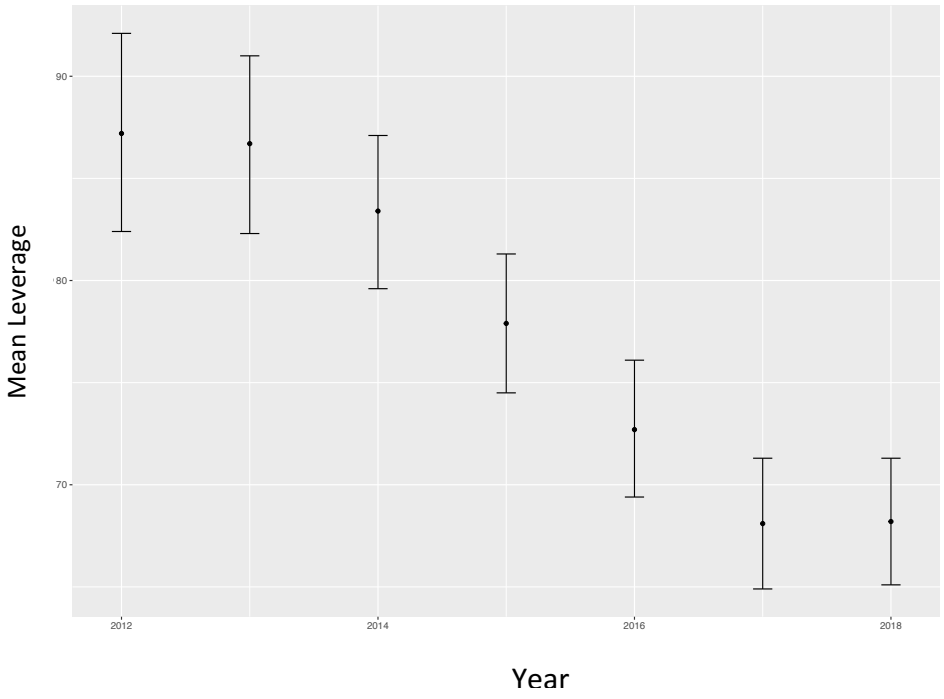
	Full Sample		Treated Sample		Control Sample	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Employees	1104.39	(12,817.34)	267.59	(4,206.89)	1,177.21	(13,103.49)
Total Assets (Millions)	453.78	(6,748.37)	229.65	(4,952.37)	441.90	(6,092.59)
Leverage Ratio	67.95	(111.69)	98.36	(143.79)	72.74	(114.04)
Liquidity Ratio	1.43	(1.69)	1.72	(3.34)	1.41	(1.56)
Solvency Ratio	39.91	(24.95)	41.78	(22.72)	42.27	(20.17)
Tangible Assets (Millions)	112.08	(2,316.66)	33.25	(529.34)	111.96	(2,293.44)
ROA	6.08	(12.08)	6.65	(10.62)	6.77	(10.65)
ROE	16.14	(59.81)	20.16	(61.90)	16.16	(43.80)
Profits Margins	6.34	(9.80)	8.33	(10.32)	6.81	(9.29)
EBITDA (Millions)	19.85	(239.42)	10.44	(241.53)	22.05	(254.01)
Inventories Turnover	40.10	(97.00)	38.47	(99.80)	39.20	(94.38)
Sales (Millions)	246.13	(2,365.07)	110.34	(997.61)	271.84	(2,791.89)

The graphs 6, 7 and 8 enable me to check the condition of validity that treatment and control groups follow the same trends before the tax reform. From 2012 to 2016, the French and Belgian sample are very similar with a decrease of the mean leverage. But in 2016, the curves take different trajectories. An explanation of this early difference can be the announcement effect of the tax reform in Belgium. Companies want to anticipate the new regime and already take measures to adapt. Furthermore, we can see that the German and French samples follow the same trend on the whole period, confirming they can both be the control group. Our sample are in line with the first validity condition.

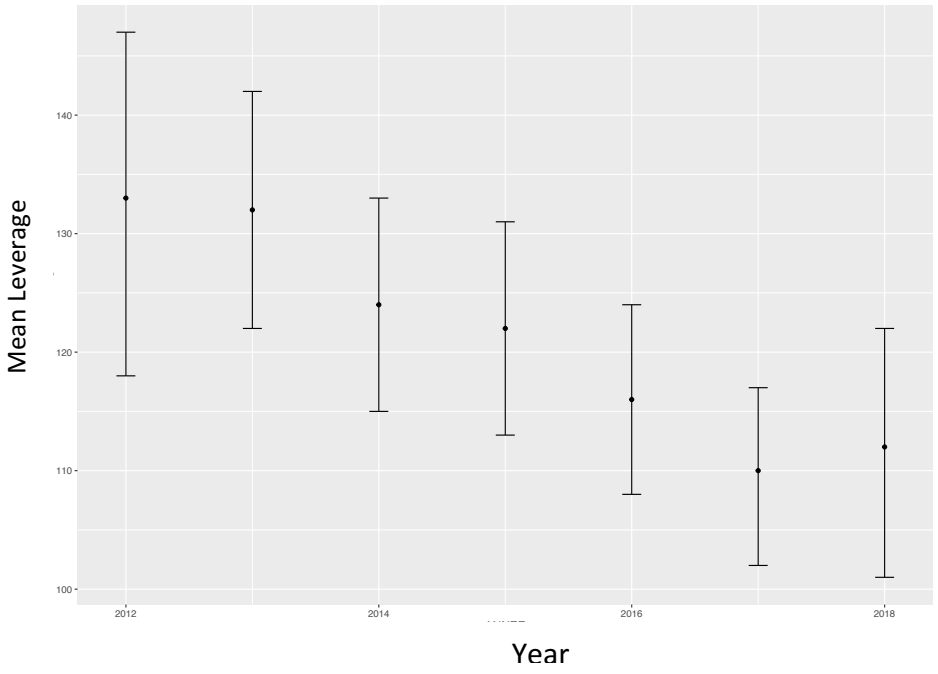
Graph 6: *Mean leverage of Belgian Companies from 2012 to 2018.*



Graph 7: *Mean leverage of French Companies from 2012 to 2018.*



Graph 8: *Mean leverage for German Companies from 2012 to 2018.*



4.3. Results

The Table 4 reports the results of the Ordinary Least Square regression using the difference-in-differences strategy on the matched control and treatment samples. The treated sample regroup the Belgian company observations and the treatment is applied in 2018. The control sample regroup the French company observations and they are not affected by the treatment. The coefficients are reported with the degree of significance indicated by the symbols *, **, *** respectively for significance at 10%, 5%, 1%. The dependent variable is the leverage ratio defined previously as the ratio between total debts and total equity.

The regression (1) regresses the leverage ratio on three dummy variables. The *"Treatment"* variable define whether or not the company is in the treatment county. The "*Time"* variable is a time-specific variable to define if the observations has been made before or after the tax reform. The *"The Tax reform"* variable reflects the existence or not of the new tax regime for the Belgian NID. In this regression, the variable we want to test, the tax reform, has a coefficient of 8,1802 and a degree of significance of 1%. It suggests the tax reform, which reduce the total deduction for companies, increase the leverage ratio by 8,1802% when enforced. However, the model doesn't take in account the other variables I used to describe the characteristics of a company observation.
The regression (2) include those variables. In this second regression, when the other features are included, the effect of the tax reform on the leverage ratio of a company is not significant anymore. Where other parameters have a significant effect on the Leverage, the impact tax reform doesn't have a significance level strong enough to draw conclusion.
Those results suggest that the impact of the new NID regime doesn't have a significant impact on the leverage ratio of companies in the treatment group. Other variables seem to have a more significant impact and we cannot conclude to the effectivity of the tax reform.

Table 4: *Effects of the new NID regime on Belgian companies' Leverage.*

The table is the result of the regression to determine the leverage, using the difference-in-differences method for Belgian and French samples. The dependent variable is the leverage ratio of a company. The Treatment is a dummy variable that takes 1 if the observed company is in the treatment country, 0 if not. The time is also a dummy variable that takes 1 if the company observation is done after the introduction of the tax reform, 0 if the observation is made before. The Tax reform is a dummy variable, based on the Treatments and Time variables. It takes 1 if the company observation is made in the experimental country after the tax reform, 0 otherwise. The solvency ratio measures the ability of the company to face its debt obligations. Tangible assets are all the tangible assets of the company in millions of euros. ROA is the Return on assets, the net income divided by the total assets. The ROE is the return on Equity, the net income divided by the total equity. The EBITDA is the profit before interest, taxes, depreciations and amortizations.
*, **, *** represents statistical significance at the 10%, 5% and 1% level.

Dependent Variable	Leverage	
	(1)	(2)
Treatment	25.7006 ***	23.813121 ***
Time	(10.3811) ***	(6.563664) ***
Tax Reform	8.1802 ***	2.39843
Liquidity Ratio	/	6.182793 ***
Solvency Ratio	/	(3.882329) ***
Tangible assets	/	0.001821 ***
ROA	/	(0.509146) ***
ROE	/	(0.175484) ***
EBITDA	/	0.001932
R^2	0.01003	0.3592

Under the Belgian point of view, this study put the light on several very interesting points. The first introduction of the Notional Interest Deduction aimed at continuing a favorable fiscal regime for companies established in Belgium and to reduce the tax induced bias between debt and equity financing. Following publications demonstrated the positive effect on the balance sheet of companies and the reduction of the leverage ratio. But at what cost for the national budget? The deduction induced huge loss of corporate tax revenues for the government while being pointed out by both EU institutions and the public opinion.

With the new regime, granting the deduction for new investments only, it was feared that positive effects of the first introduction would be vanished. This study tends to show that this is not the case. The new NID regime seems not to have a significant impact on the leverage ratio of Belgian companies. With a lower total amount of deduction granted, the public budget will have more revenues from the corporate income tax, responding to the critics pointing out the cost of the NID. This conclusion opens the way for a larger debate on the optimal organization of an Allowance for corporate equity and the discussion about the necessity of not of such a regime in a hypothetic European fiscal system.

4.4. Limits of the experimental study

The results obtained with the regression using the difference-in-difference method provide a first estimation of the effects of the new tax regime on the leverage ratio of Belgian companies and the tax induced bias in the country.

However, despite paying attention to build a model as robust as possible, I must note some aspects that could limit the validity of this study and could be improved during further researches.

The first aspect is the access to the relevant data. The ORBIS data base provides a large amount of data that were the basement for this study. Nevertheless, when I extracted the data, some company-year observations were missing one or more variables. With an access to other data base and much more time, it would have been possible to fill those gaps and to have an even more detailed data base.

Another point related to the data base, is the very small number of company-year observations already available for 2019. The reduced number of complete observations pushed me to give up on using the company observations of the year 2019. Including that year in this study would have add another post-treatment year and would have improved the validity of the final results.

The time constraint also played a role on the decisions made to build the regression model. Indeed, with much more time, I would have been able to test a larger range of variables, or to construct new one, in order to improve the predictive power of the model. With a model fitting better with the reality, measuring the impact of a new tax regime based on the model becomes more relevant and generates more robust results.

Being aware of the limits of this model and the resulting conclusions can be seen as positive. I know that improvements can be brought to the empirical study and it opens the way for longer and deeper researches on the topic.

4.5. ACE in a global European taxation system.

In this section, I want to go further by discussing the pros and cons an ACE under the perspective of an integrated EU wild fiscal system. As we showed previously in this paper, fiscal systems can be very different between European countries. We can classify them into two main categories, the low corporate tax rates countries with less tax incentives and the countries with high corporate tax rates but offering a range of fiscal incentives to reduce the Effective Tax Rate. However, partly due to fiscal competition, the recent trend is favoring the low corporate tax countries, pushing the second category of countries to adapt their taxation system. As the following figure from the BNB shows, many countries are trying to repeal exemption regimes while cutting on the corporate tax rate.

Table 5: *Corporate tax reform initiatives in other EU Countries.*

	Approved ?	Characteristics of the current system	Reform timetable
Netherlands	Approved in the Dutch government agreement of October 2017	Progressive system: € 0-200 000: 20 % > € 200 000: 25 %	2019: € 0-200 000: 19 % > € 200 000: 24 % 2020: € 0-200 000: 17.5 % > € 200 000: 22.5 % 2021: € 0-200 000: 16 % > € 200 000: 21 %
France	Approved by the French parliament in December 2017	Progressive system: An earlier reform in 2016 made provision for a reduction to 28 % in 2020. In addition to the rate in force, a supplementary contribution of 3.3 % is levied.	2018: € 0-500 000: 28 % > € 500 000: 33.3 % 2019: > € 500 000: 31 % 2020: Abolition of the progressive system Rate of 28 % 2021: Rate of 26,5 % 2022: Rate of 25 %
Luxembourg	Approved by the Luxembourg parliament in December 2016	Reform already begun in 2017. The rates also include the municipal business tax and the unemployment fund contribution.	2017: 27,1 % 2018: 26 %
United Kingdom	Proposed reform	Reduction from 20 % to 19 % from 1 April 2017 (already decided).	2020: 17 %

Source: NBB Economic review (2018)

To achieve a European taxation system, it is crucial to have compensatory measures to ensure the transition. If a common corporate tax rate is enforced, probably in the middle between the higher and the lower CIT rates, countries with low corporate tax rates will see their fiscal revenues surge. At the opposite, some countries where the CIT is a huge contributor to the budget may see their revenues fall and they might face budgetary distress. Fiscal revenues transfers should be organized during a transition period.

But the creation of such an integrated European tax system would be a unique opportunity to address the issue of the tax induced discrimination between debt and equity without the issue of fiscal optimization structures. The treat of profit shifting, outsourcing, etc. resulting from fiscal competition do not hold in a European fiscal regime. It would be less harmful for national economies to change the fiscal rules for more fiscal revenues and reach neutrality between debt and equity financing. This is why the creation of a European taxation system would be the opportunity to introduce smoothly a new global solution.

At the moment, when a country enforces an ACE like regime, companies tend to use it more like a vehicle to reduce the overall corporate income tax liability and the policy loses its first goal, which is pushing companies to use more equity as financing source.
If the ACE was enforced at a European level, inter country transfers wouldn't affect the CITL as the ACE incentive is common to every country. It will reduce the fiscal competition between EU countries, may attract capital from foreign countries and will reduce the cost of equity. Overall, a European ACE may reach its target to improve the balance sheet of European companies and strengthen their financial positions.

But the cost of the ACE will not be approved in every European country. Indeed, as we saw in Belgium, when enforced and depending on the chose regime, an ACE can undermine the public budget and some European countries cannot afford such cost. Furthermore, the negative reputation of ACE might destabilize some governments in the context of a growing populism. I would suggest to idea to enforce both the ACE and the CBIT to balance the negative effects of both measures. By increasing the cost of debt

and collecting more revenues from taxes paid on interests, government could pay for the reduction of the cost of equity through ACE.

If each measure does the half of the way to close the gap between debt and equity financing, and if the cost and revenues from each policy induce budgetary neutrality, a European taxation system might be a unique opportunity to address the tax induced debt-equity bias. Furthermore, starting from a clean sheet could be the opportunity to enforce both regimes in one shot, to avoid some transition issues with previous regimes.

5. Conclusion and Further Researches Tracks

The debate surrounding the discrimination between debt and equity due to the tax system in place has lasted for decades. Whether it is on the consequences or on the different ways to fix it, no clear conclusions have settled the divergence of opinion. This paper aimed at collecting different point of view, historical facts over the tax-induced bias and conduct a quasi-experimental study over the effects of a new regime that is vowed to address that issue.

The first introduction of the Notional Interest Deduction aimed at continuing a favorable fiscal regime for companies established in Belgium and to reduce the tax induced bias between debt and equity financing. Following publications demonstrated an increase in the balance sheet of companies but also furnished proof of the significant cost of the NID for the public budget. This cost, unbalanced by an increase in revenues from other sources, entrenched the reputation of the NID in the public opinion and the political cast as a fiscal gift for large MNEs. This leaded the government to review the structure of the NID in 2018 and reduce the range of deduction to new equity-financed investments only.

This paper demonstrated that such a tax reform did not had a significant impact on the leverage ratio of companies. It means the benefits of the first form of NID, the increased amount of equity on the balance sheet, haven't disappeared. The new NID regime grants less deductions, therefore it will be much less costly than the previous one and will not affect the public budget as much as before. It enables the government to reduce the CIT rate, in line with the trend in other European countries. However, further studies with more detailed data available on a longer post-treatment period might bring stronger evidence of the impact of the new regime. It would be an exciting topic for deeper researches in the years to come.

This is why, in my opinion, an Allowance for Corporate Equity, maybe under the same regime as the NID, would be worth implementing in a hypothetic European taxation system. Introducing an ACE, coupled with the tax revenues of a CBIT, would balance the negative effects of an ACE on public budgets while being an effective shot at reducing the discrimination of equity. It would improve the balance sheet of European companies, therefore reducing their exposition to downturn and systemic crisis, which is crucial in an always more shaken world.

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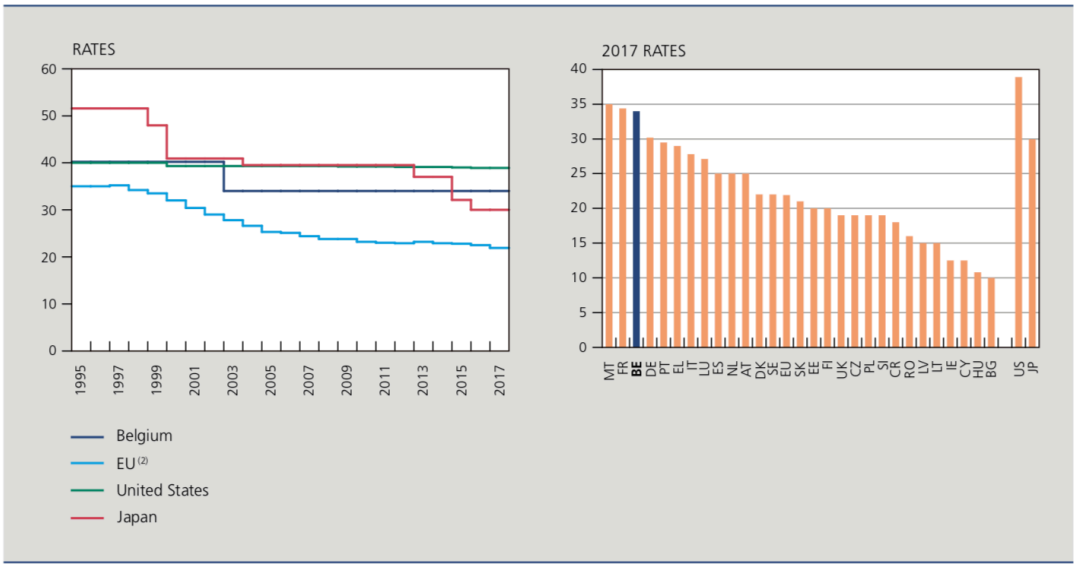
Appendix

Appendix 1: *Corporate tax rates in EU Countries and comparable Countries*



Source: EC.
(1) These are the highest statutory tax rates, including any local or regional taxes on corporate profits.
(2) Unweighted average.

Source: NBB Economic review (2018)

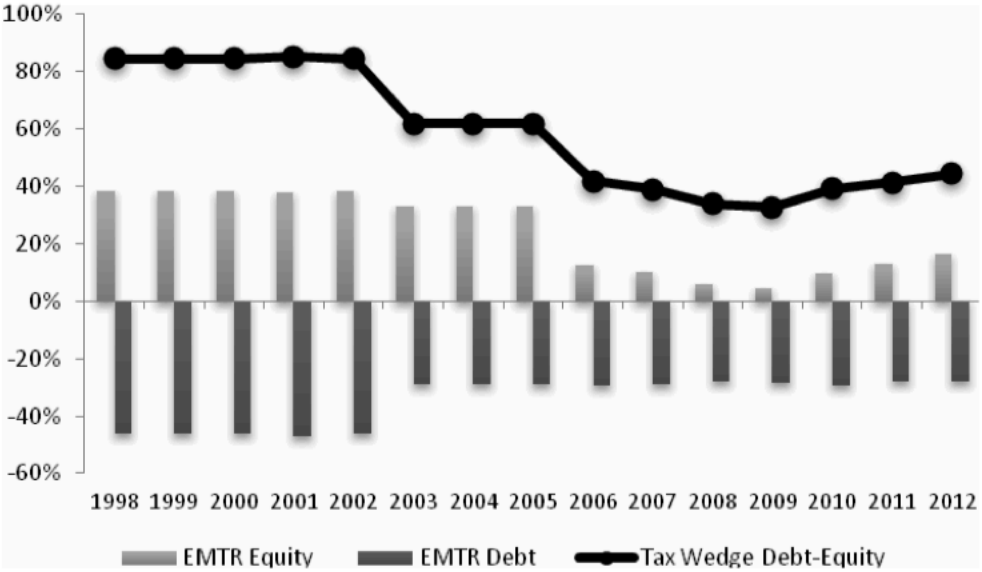
Apendix 2: *Consolidated ETR (Tax/EBIT), by Member States (2010-2015)*

Country	Domestic groups				Multinational groups			
	% obs. used	TAX/EBIT			% obs. used	TAX/EBIT		
		Mean	Median	Skewness		Mean	Median	Skewness
Austria	69.8	19.4	19.8	1.2	74.3	22.5	23.4	1.2
Belgium	65.2	27.8	29.0	0.6	72.5	25.9	24.8	1.5
Bulgaria	47.4	10.7	7.0	2.1	57.1	7.5	8.7	-1.0
Croatia	53.9	7.4	6.9	1.3	56.5	11.7	10.6	0.7
Cyprus	20.4	14.0	11.0	1.0	38.1	15.3	14.7	0.7
Czech Republic	29.4	32.5	21.7	1.6	87.5	24.7	18.8	1.9
Denmark	63.0	20.8	20.8	1.4	73.7	23.2	23.1	1.4
Estonia	60.0	28.3	17.7	0.7	63.6	15.5	13.6	1.0
Finland	72.5	19.9	19.8	1.7	72.8	23.6	22.2	1.6
France	57.2	24.9	24.9	1.1	66.5	26.9	26.0	1.4
Germany	67.1	24.0	23.4	1.3	76.1	27.8	27.4	1.5
Greece	43.2	20.6	17.4	1.7	58.7	22.7	21.7	0.9
Hungary	48.9	16.1	10.5	1.7	68.4	12.6	10.3	1.0
Ireland	39.7	14.7	13.5	2.4	54.9	19.3	15.3	2.6
Italy	59.7	37.3	35.3	0.9	73.3	33.5	32.7	0.8
Latvia	71.3	18.9	15.4	3.0	73.1	13.3	15.1	0.7
Lithuania	68.5	9.5	9.6	-0.3	50.0	11.3	11.3	0.0
Luxembourg	43.8	19.3	19.2	0.0	56.9	27.2	25.2	1.3
Malta	49.3	24.5	25.8	0.3	33.3	14.5	12.2	1.0
Netherlands	58.1	21.2	21.4	1.5	68.0	24.4	22.5	1.9
Poland	59.3	17.8	17.6	2.1	72.9	17.6	16.8	1.9
Portugal	57.9	20.0	19.1	1.8	72.8	21.8	20.0	1.7
Romania	51.6	15.8	13.9	1.9	100	12.8	12.8	0.0
Slovakia	30.4	24.2	23.3	1.2	14.3	16.3	16.3	n. a.
Slovenia	45.5	8.9	9.0	0.0	54.2	8.9	7.8	-0.1
Spain	49.6	21.6	21.7	1.0	58.5	20.8	20.1	1.2
Sweden	65.5	20.6	21.8	1.4	71.1	24.7	23.9	1.9
United Kingdom	58.6	19.2	20.3	1.3	69.4	22.1	22.3	1.4
EU 28	**59.7**	**22.1**	**21.6**	**1.3**	**69.9**	**25.1**	**24.1**	**1.4**
Average		**20.0**	**18.5**	**1.3**		**19.6**	**18.6**	**1.1**
Std. deviation		**6.8**	**6.7**	**0.7**		**6.5**	**6.3**	**0.8**
High values		**IT**, CZ, EE, BE	**IT**, BE, MT	**LV**, IE, BG		**IT,** DE, LU, FR	**IT,** DE, FR, LU	IE, PL, SE, NL
Low values		HR, SI, LT, BG	HR, BG, SI, LT, HU	**LT**, LU, SI, MT, EE		BG, SI, LT, HR, HU, RO	SI, BG, HU, HR, LT, MT	**BG**, SI, LT

Notes: Based on the consolidated accounts from Orbis. *"% obs. Used"* refers the fraction of accounts which have a positive operating profit (EBIT), a non-negative tax liability and an effective tax rate within the interval of 0 to 1. Means and Medians are in %. n.a. represents a case, where the skewness is not defined because we have only one observation. *EU 28* refers to the average value for the EU overall and *Average* refers to the arithmetic mean of country values. High/low values are one standard deviation above/below the unweighted "Average", bold entries are 2 standard deviation above/below.

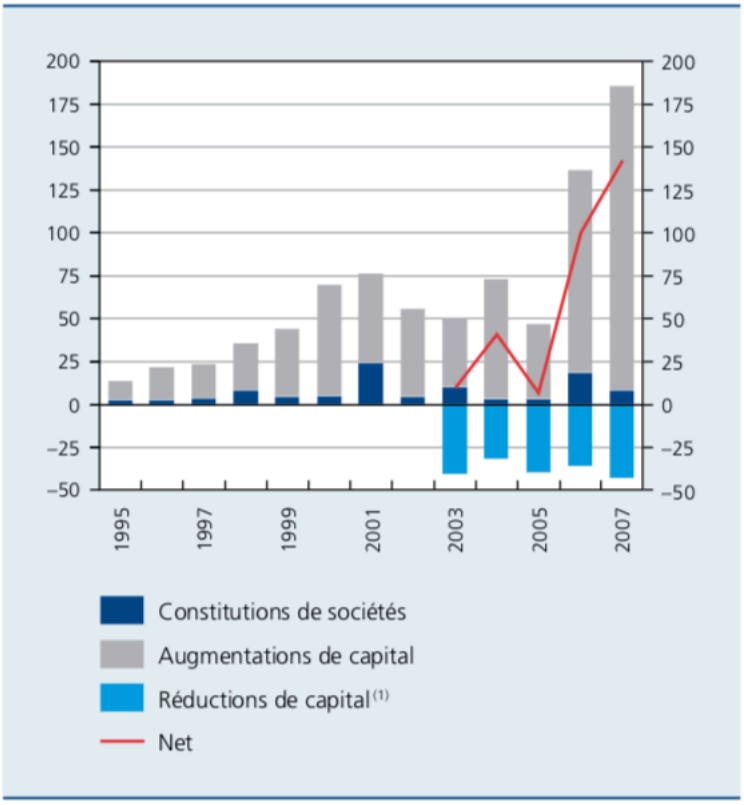
Source: EU commission Taxation Paper (2017)

Appendix 3 : *The effective marginal tax rate on debt and on equity (1998-2012)*



Source: ZEW (2012)

Appendix 3 : *Variation of the level of Equity for Beglian Comapnies between 1995 and 2007(In Billion Euros)*



Source : NBB (2008)