

Debt bias in corporate financing decisions

Overview, implications, comparisons and alternatives.

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Abstract:

The aim of this work is to analyze the phenomenon of the debt bias occurring because of the deductibility of interests from the taxable income of firms in most tax systems. Because of this, firms are more likely to search for financing resources through debt instead of investing in themselves with resources coming from own interests. In this work an overview of the distortion is given, from the principles of the capital structure theory to the actual phenomenon, up to possible remedies and considerations for the future.

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Contents:

<i>Figures and Tables</i>	V
Chapter 1 – Introduction	1
1.1 <i>Definition of corporate finance</i>	1
1.2 <i>Areas of corporate finance</i>	1
1.3 <i>Equity financing</i>	4
1.4 <i>Debt financing</i>	6
1.5 <i>Hybrid securities</i>	8
Chapter 2 – The theory behind the capital structure	10
2.1 <i>Definitions and theoretical background</i>	10
2.2 <i>Derivations from the original theory</i>	15
Chapter 3 – The bias towards debt in current taxation systems	26
3.1 <i>Analyzing the debt bias phenomenon</i>	26
3.2 <i>The rationale(s) for sources of financing discrimination</i>	30
3.3 <i>The size of the debt bias</i>	34
Chapter 4 – Overview of the solutions and the possible remedies	47
4.1 <i>The causes of the global financial crisis</i>	47
4.2 <i>The aftermath of the global financial crisis</i>	53
4.3 <i>Policy responses overview and implications</i>	54
4.4 <i>The status quo in the EU28 area</i>	76
Chapter 5 – Concluding remarks	83
Bibliography	87

Figures and Tables:

<i>Figure 1: firms' areas of corporate finance.....</i>	<i>2</i>
<i>Figure 2: firms' sources of financing.....</i>	<i>4</i>
<i>Figure 3: 1977 Miller's model.....</i>	<i>13</i>
<i>Figure 4: 1984 Myer's static-tradeoff theory of capital structure.....</i>	<i>17</i>
<i>Figure 5: 1976 Jensen-Meckling argumentation on optimal capital structure determination in case of agency costs and under the trade-off hypothesis.....</i>	<i>18</i>
<i>Figure 6: Pecking-order Theory priority diagram.....</i>	<i>20</i>
<i>Figure 7: Gap of effective marginal tax rates (EMTR) on debt and equity financed new investments (in percentage points).....</i>	<i>36</i>
<i>Figure 8: Contribution of the debt bias to leverage (in percentage point of leverage).....</i>	<i>43</i>
<i>Figure 9: Effect of debt bias on probability of crisis.....</i>	<i>51</i>
<i>Figure 10: Time-series of firms' leverage ratios before and after ACE implementation in Italy (2011).....</i>	<i>69</i>
<i>Table 1: Differences in the rate of return for debt financing and equity financing.....</i>	<i>28</i>
<i>Table 2: Return on investment in case of debt financing case.....</i>	<i>30</i>
<i>Table 3: Summary of studies using single country data.....</i>	<i>39</i>
<i>Table 4: Summary of studies using cross-country variation.....</i>	<i>40</i>
<i>Table 5: Analysis of Variation of the Tax Elasticity of Debt.....</i>	<i>41</i>
<i>Table 6: Policy options to contrast debt bias.....</i>	<i>56</i>
<i>Table 7: TCRs with fixed ratio.....</i>	<i>58</i>
<i>Table 8: Earnings-stripping rule.....</i>	<i>58</i>
<i>Table 9: Current tax policies in Europe addressing debt bias.....</i>	<i>81</i>

“Companies are taxed heavily for making investments with equity; yet the tax code actually pays companies to invest using leverage”

(Barack Obama, 2011)

CHAPTER 1 – Introduction

1.1 Definition of corporate finance

In our society, firms are set up in order to achieve certain objectives. It may seem strange, but usually these goals are not directly addressed toward making a profit, but they are linked to a vision, that is a large and broad statement that described in a general but effective way what a company is formed for. Profit is not a side effect, it is extremely important as well, as it is fundamental to the achievement of the said objectives and goals and to the wellbeing of the ones involved in the process.

We know that every decision that a firm makes has financial implications. Having financial implications, the subject goes naturally under the rubric of corporate finance.

When dealing with corporate finance, one has to know that this terms refer to a wide range of instruments, means and actions that are strictly related to the capital structure of a firm, to the ways in which the management tries to increase the value of the firm to the shareholders and to the tools and analysis used to allocate resources and evaluate significant events or projects.

So, in a very broad way, corporate finance regards all the aspects of a firm that involve financial resources so, as every step taken by a firm has financial implications, corporate finance concerns every aspect of the firm that may have reflections on the resources of the firm itself.

1.2 Areas of corporate finance.

Corporate finance is a branch of the whole set of decisions that a corporation (or, in general, a firm) has to make, along with decisions concerning investments, divestments and dividends retention or distribution.

The final task of corporate finance is to increase the value of the firm and to maintain it competitive throughout time in order to operate in the long term

and to achieve the objectives described by the management or in the mission and vision statements.

Corporate finance involves many areas of the firm's dimension. These areas are strictly linked one to another and, briefly, concern the firm's decisions in investments, in financing and in dividend policies (described as the firms' core principles in Damodaran (2014)).

Damodaran (2014) describes the main areas of corporate finance as parts of a bigger picture that is the business and the path to its value maximization. As said, in this sense the three main areas are defined as concerning matters such as investments, financing and dividends.

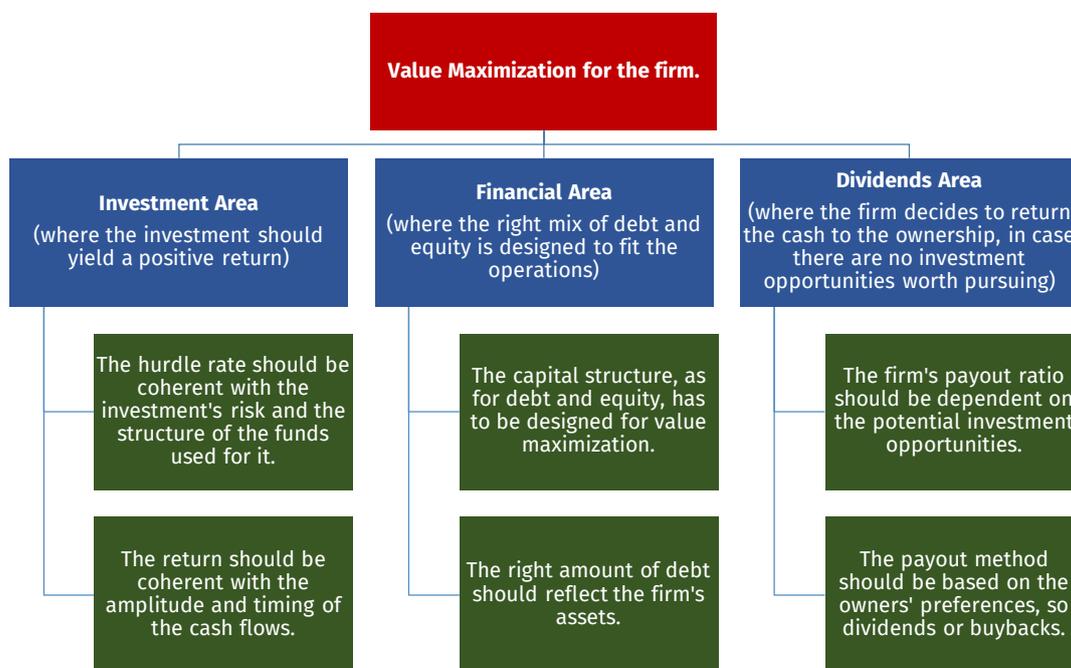


Figure 1: firms' areas of corporate finance.

from Damodaran, Aswath. (2014), "Applied Corporate Finance.", John Wiley & Sons. Hoboken/NJ.

With respect to investments, a firm must seek value maximization through investments in assets and projects looking for returns higher than the minimum acceptable hurdle rate.

The financing principle regards the choice of a capital structure (as we will see later on in this thesis work) that reflects the nature of the assets or investments being financed.

The dividend retention principle defines the cases and the occurrences in which cash shall be returned to the business owners or retained into the firm in order to seek further investment opportunities.

In this document we will focus on subject involved in the financing principle, as it is fundamental to our perspective to understand how the capital structure is influenced by decisions taken about its very composition, whether or not they follow the main lines of thought described in Chapter 2.

Every area of decision in the firm's dimension is important for the firm's life itself, but each one can have its own weight, depending on many variables, such as the firm's size in terms of turnover, number of employees, geographical extension, or fields of interest and industry.

Even though a firm shall monitor and operate within certain guidelines (according to the right mix of weights of the said areas or principles), one aspect that is almost always more relevant than others is the capital structure of the firm.

Corporate finance concerns mainly and mostly the area of the firm related to its provision of financial resources, which will have to be gained, utilized and re-allocated in some way.

Basically, a firm can search for funding sources in several ways, which can be summed up in two main categories of sources of financing:

- Debt capital;
- Equity financing.

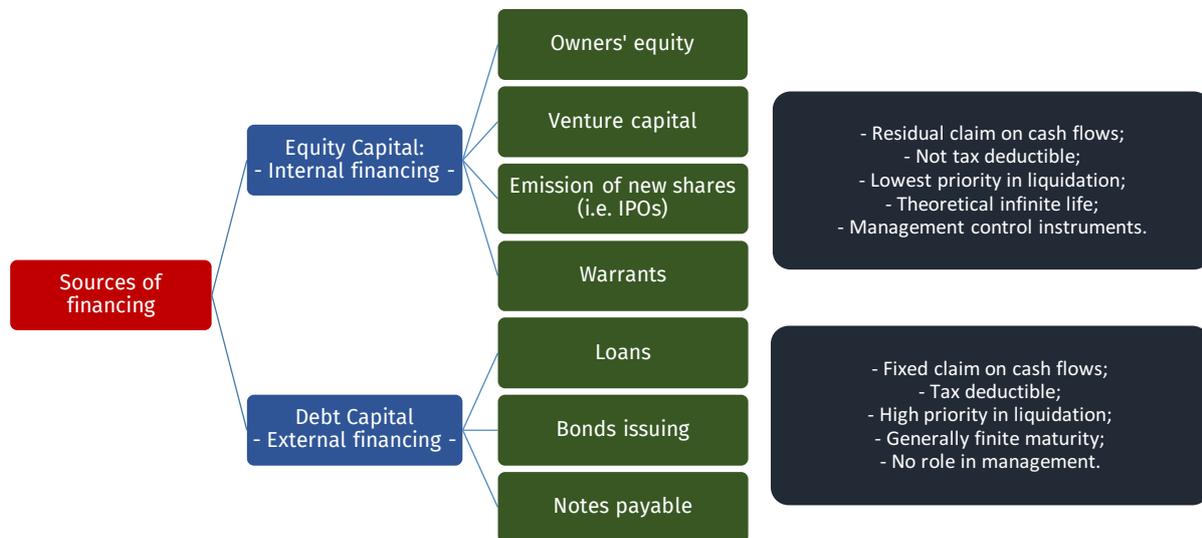


Figure 2: firms' sources of financing.

This distinction is strictly related to the origin of the source of financing, which can be internal to the firm (i.e. shareholders) or be an external subject (i.e. bondholders). This distinction may seem simplistic, but sums up in a very effective manner how the provision of financial resources works according to the provenance of the resource itself.

1.3 Equity financing

When a company decides to finance itself not relying on debt, it may rely on internal sources of capital. This way of financing can assume the form of owners' equity operations, venture capitalist intervention, emission of new shares, issuance of warrants and other instruments.

Usually equity means common stock, but the equity claim on a business can take a variety of forms. This is due to the characteristics of the firm's ownership (i.e. the firm is privately owned or publicly traded) and to the firm's growth and risk characteristics¹.

¹ Damodaran (2014)

For example, a firm may decide to go for owner's equity, meaning that it would rely on one or few individuals providing the amount of funding needed and/or to plow back the amount of capital gained through the lifetime of the business into the business itself.

Usually, in the case of small or risky firms, the company cannot find the right amount of resources needed in order to operate and assure a real growth to the business itself. In this circumstance, the firm may decide to seek out for external investors, who might help financially the firm in exchange of a part of the ownership whole.

Another case of equity financing is depicted by the conventional way for a publicly traded firm to raise equity, that is to issue common stock at a price the market is willing to pay.

In recent years, firms have started using certain financial instruments called *warrants*, which are tools that give to the holder the right (not the obligation) to buy or sell a predetermined quantity of stocks at a predetermined strike-price and within a certain date. In most cases warrants give the holder the right to subscribe new shares of a publicly traded company, allowing the company itself to raise funds.

There are many other methods to raise funds via equity. In this sense the firm can decide from a wide array of choices, depending on the private or public nature of the investor and the degree of *openness* that the firm wants to achieve (so the management can address the offer of new shares or equity instruments to the general public or to more specific subjects).

The main characteristics of equity financing focus on the fact that in this way, financing the firm equals (in some way and in some measure) owning the firm. Financing via equity permits the funder to have possession of a share of the firm's ownership and the right to manage it (usually through the voting system).

Owning the firm has relevant aspect not only in the managerial dimension of the firm, but also allows the owner to claim a residual part of the cash flows (i.e.

dividends), while having the lowest priority in the liquidation process. All of the aspects referred to equity financing have theoretically infinite life.

So, in summary, the firm can gather financial resources internally by having the owners of the company bringing in funds. In this case we refer to the *owner's equity*, representing the basis for the growth, especially for the smaller or new businesses.

1.4 Debt financing

The other natural way to a firm to raise funds for corporations is to rely on borrowed funds (debt capital or credit) as sources of investment in order to sustain ongoing business operations or to fund future growth.

One can find several implications beyond the decision to go for debt funding. From the management point of view, even though debt has a very high strategical weight, it does not corrode the proportions existing in the management pool. In general, the individuals or subject granting debt to a firm does not gain management rights nor ownership shares.

Going for debt implies that the borrower accepts a fixed claim (not residual – as in the case of equity financing) in favor of the lender that has, generally, a finite maturity.

Other aspects that are important when a firm considers to get indebted are related to the fact that the lender has a higher priority when it comes to liquidation with respect to others that has the rights to claim something from the firm, such as shareholders.

The characteristic of debt around which this final thesis work revolves is that debt allows the firms to get a deduction from taxes, generally when it comes to interest payments. We will discuss this aspect further in this document.

Debt is available in the market through a multitude of forms, thanks to the (within certain legal boundaries) customizable nature of the contractual agreement. The traditional and simplest forms of debt are represented by

financial instruments such as bank loans, notes payable, or bonds issued to the public.

Bank loans are the probably the more representative way to describe debt, as it is the first instrument that comes into mind when dealing with debt. A loan consists of an agreement between two or more parties. In this agreement a certain amount of money is lent by a lender (i.e. a bank) to a borrower (a firm, an organization or an individual), to be given back in periodical installments within a certain time frame, charged up with interests, which represent substantially the price for the loan. Several options are available in order to get the most advantageous loan possible, with respect to amount needed, risk tolerance, firm's size, seasoning financial needs etc.

Notes payable are written promissory notes, which confirm that the borrower is going to pay a due amount within a certain period of time, charged of interests. Here the main difference from loans is that the contractual dimension is coming from a promise of payments instead of a mutual agreement that is previous to the loan.

For larger, and often publicly traded companies, a viable option to gather financial resources is represented by *bonds*. Issuing bonds, for a firm, means that the firm release in the market a predetermined amount of sellable contracts at a certain price. This contracts allows the subscribers to claim a certain amount of money equals at least to the amount paid for the contract itself (face value – in case of at par and above par bonds, not below par bonds), plus interests.

Bonds require the corporations to make regular interest payments (interest expenses) on the borrowed capital until the debt reaches its maturity date, therein the firm must pay back the obligation in full.

Debt payments can also be made in the form of *sinking fund provisions*, whereby the corporation pays annual installments of the borrowed debt above regular interest charges.

Corporations that issue callable bonds are entitled to pay back the obligation in full whenever the company feels it is in their best interest to pay off the debt payments. If interest expenses cannot be made by the corporation through cash payments, the firm may also use collateral assets as a form of repaying their debt obligations (or through the process of liquidation).

Another kind of way to raise capital is selling own shares to investors, which would likely expect that there will be an upward trend in the value of the firm over time in order to make their investment profitable².

1.5 Hybrid Securities

So far we have seen that equity and debt differ from one another with respect to nature of the part of the firm's cash flows and assets that can be claimed (residual or fixed) and with respect to the management privileges that each instrument gives or do not give to the respective owner. Anyway, there are securities that cannot be filled neatly in one of these two categories, because they share characteristics of both. These securities are called hybrid securities and are financial instruments like preferred stocks, option-linked bonds and convertible bonds. However, we will not refer to certain hybrid instruments in particular anymore in this work, even though we will discuss about their role with regards to taxation and debt bias. We will rather focus on the extreme sides of financing, so internal and external.

² The value is going to be related to the ongoing and future processes of investment, which would have to make the firm earn a positive rate in order to be profitable.

CHAPTER 2 – The theory behind the capital structure

2.1 Definitions and theoretical background

The capital structure of a business represents one of the focal points of this thesis work, as it is both the starting point and the final result of a series of decisions about financial resources taken considering all the implications explained in the next chapters and sections.

With the terms “capital structure” we refer to the combination of resources at the business disposal with different provenance, briefly equity or debt, as previously explained, often referring to a debt/equity ratio called *leverage* (or *gearing*). The capital structure of a firm represents how it finances its overall operations and growth by using a combination (or a *mix*) of all the above mentioned options and many other financial instruments.

The basis for modern thinking of capital structure derives from the Modigliani-Miller Theorem, which led to the capital structure irrelevance principle, even though all of this is treated merely from a theoretical point of view. In their seminal 1958 paper, Modigliani and Miller initiated the modern discussion of the amount of debt corporations should use, instead of focusing on which financial tool a firm should go for comparing to others (Titman (2002)).

The studies behind the capital structure, nowadays, have come to several conclusions and theoretical models under which a firm may decide how to build up its own capital structure, but the answer to “How do firms choose their capital structure?” is simply “We don’t know”³.

³ Myers (1984)

Here Myers propose several reasons why all the theories behind the models built in order to explain and forecast capital structures behaviors have important weak points and should be considered with caution when advising managers.

Even though the Modigliani and Miller Theorem provides the basis for the modern studies of capital structure, it is based upon a model of an economic world in absence of taxes, bankruptcy costs, agency costs, asymmetric information and in an efficient market (so no frictions at all). So, in this sense, the rules by which the capital structure of a firm should be represented are pretty strict, ideal and very unlikely in the real world. Anyway, the theorem states that the value of a firm is not likely to be altered by the way the firm itself is financed so all combinations of debt and equity can maximize the value of the firm. In reality we sure know that every firm encounters many situations in which debt could be more appropriate than equity financing and vice versa, leading us to state that the optimal combination of debt and equity for a firm's capital structure is the one that maximizes the value of the business.

Modigliani and Miller, based on the hypothesis above, obtained the following results:

- 1- The value of a firm (and of its cash flows) does not depend on its capital structure;
- 2- The cost of equity for a firm with a certain amount of debt in its capital structure is equal to the one of a firm without any debt, plus a premium for the financial risk (or, even, the cost of equity is equals to the cost of debt as regarding the interest rates). In this way, operating on the gearing of a firm (so changing the mix of debt and equity for the capital structure) the final result, that is the overall risk and the overall value of a firm, remains the same.

So, in the second proposition, Modigliani and Miller argued that increasing the gearing ratio for a firm would lead to an increase in the overall risk of the firm, getting the investors and the shareholders to require a higher premium for the increased risk.

In a subsequent work in 1963, Modigliani and Miller introduce in their theorem income taxes⁴ (so tax deductibility for interest to be paid), therefore introducing the phenomenon under which the presence of debt represents more value for a firm (because of the tax deductibility of interests). We will discuss these aspects more profoundly furthermore in this thesis work.

In another subsequent work by Edward Miller⁵, the concept of irrelevance of the capital structure has been reintroduced thanks to the the Neutral Mutation idea.

This concept relies on the fact that the adoption of a specific capital structure for a firm may be due to habits and specific choices that may have not given advantages nor disadvantages to the firm, so adopted over and over again. Given the great variety of types and kinds of capital structure spread in the markets, this concept may help explaining why one should expect not the adoption of a “preferred” capital structure by the firms, even though Miller himself did not state that all of firms’ financing habits are neutral mutations, only that some of them may be (Myers (1984)).

⁴Modigliani and Miller (1963).

They did mention taxes in their 1958 work, but they did not explain in depth the advantages that could be brought in leverage.

⁵ Miller, E. (1977).

In this work, a relevant result is given by the idea that, when there is equilibrium in the stock market and in the debt market, there is no advantage to go for debt instead of going for equity financing.

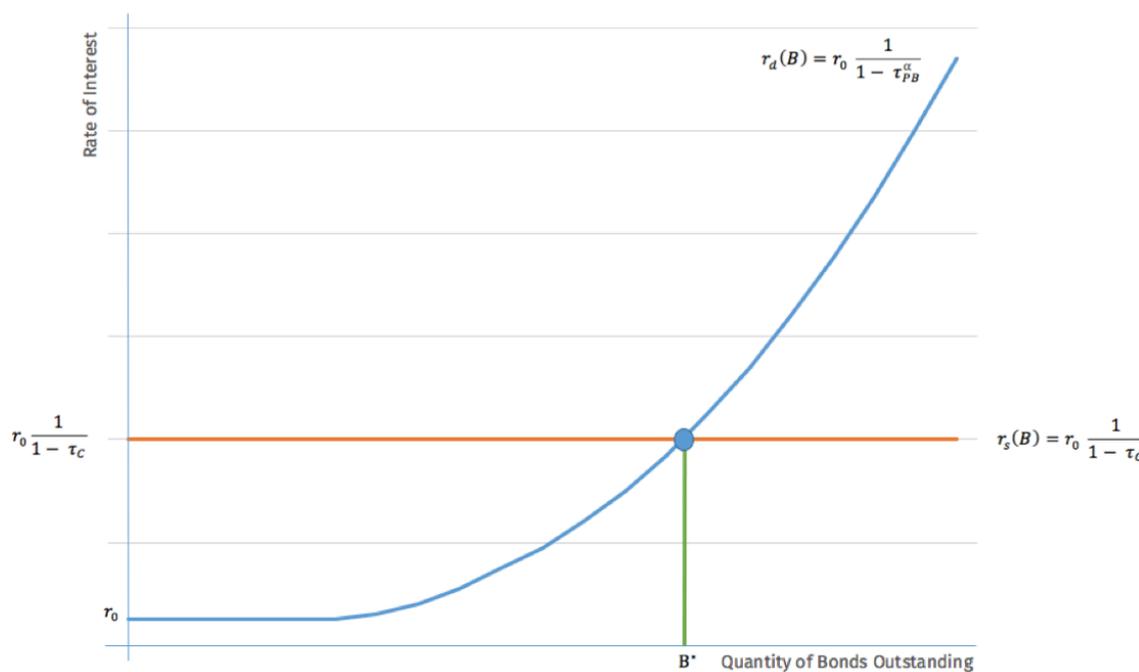


Figure 3: 1977 Miller's model.

from Miller, Edward M. (1977), "Risk, uncertainty, and divergence of opinion.", *The Journal of finance*, 32(4) 1151-1168.

The graph above is the result of the following:

- 1) First, we assume that, in fact, debt can bring a certain gain to the firm, represented by

$$G_l = \left[1 - \frac{(1 - \tau_C)(1 - \tau_{PS})}{1 - \tau_{PB}} \right] B_l$$

where τ_C is the corporate tax rate, τ_{PS} is the personal income tax rate related to common stocks' gains, τ_{PB} is the personal income tax rate applicable to income derived from bonds and B_l is the market value of the levered firm's debt;

- 2) So, we can easily compare the value of a firm with 0 debt and a firm with a certain amount of debt as

$$V_l = V_u + \left[1 - \frac{(1 - \tau_C)(1 - \tau_{PS})}{1 - \tau_{PB}} \right] B_l$$

with V_l corresponding to the value of a levered firm and V_u to the value of an unlevered firm; here we can see that the *before-tax* return on taxable bonds plays a role in determining whether a subject may be interested in bonds or not. If the taxation on personal income derived from common stocks is higher than the taxation hitting on incomes coming from bonds, then the *before-tax* return on taxable bonds has to be high enough to compensate this difference, in order to not create a distortion for investors towards equity financing, thus the rates have to satisfy the equation

$$(1 - \tau_{PB}) = (1 - \tau_C)(1 - \tau_{PS})$$

That is the equilibrium condition⁶;

- 3) In the graph, the upward sloping curve labeled $r_d(B)$ represents the demand for bonds by the public and the supply is represented by $r_s(B)$ and are driven by the returns, respectively, of the bonds demanded by the public and the return offered by the firms;
- 4) On the left side with respect to B^* (representing the quantity of bonds offered and demanded in equilibrium), we can find first all those bonds which are not or low taxed, such as those of state and local governments. Once there are no more tax-exempt bonds, investors would likely ask for a premium in order to compensate the taxation. If corporations were to offer a quantity of bonds greater than B^* , then interest rates to be paid to

⁶ Note that, in his 1977 work, Miller stated that personal taxation is relevant in principles, but from a practical point of view, it could be easily ignored because of the delay in the personal taxes payment with respect to the actual realization of the capital gains, so having an equilibrium condition equals to $(1 - \tau_{PB}) = (1 - \tau_C)(1 - \tau_{PS})$.

investors would be higher than the supply rates, so making leverage a bad opportunity for firms;

- 5) Assuming the relatively irrelevant value of τ_{PS} , in B^* we can find that the tax rate of the incomes from bonds is equal to the corporate tax rate. In equilibrium condition we would have

$$V_u = V_l$$

making the value of a firm independent from its capital structure, despite the deductibility of interest payments in computing corporate income taxes⁷.

2.2 Derivations from the original theory

From the original work of Modigliani and Miller (1958), there have been, initially, two main evolutionary branches of the capital structure studies, which have been controversially debating against the results gained by Modigliani and Miller.

a. The Static Tradeoff Hypothesis

From a critique by Kraus and Litzenberg⁸, regarding the firm's ability to pay interest on its debt, the Static Tradeoff Hypothesis has been derived.

This derived hypothesis from the MM's theorem directly contrasts the results of the MM's theorem itself by stating that a firm is not indifferent with regards to the composition of its capital structure, but the capital structure itself is

⁷ Many critiques are moved against Miller's work because of the way too strict characteristics of his hypothesis. For example, if we introduce the possibility to short-sell in the market, Miller's model results in paradoxical conclusions. Others have observed that in the real world we would likely have a more sophisticated taxation structure; also, simply by removing the perfect information condition from the model, we would immediately have a preference towards a certain source of financing with respect to another, as noted in Myers (1984).

⁸ Kraus and Litzenberger (1973).

“determined by a tradeoff of the costs and benefits of borrowing, holding the firm’s assets and investment plans constant” (Myers (1984)). This result is obtained by introducing some sort of friction in the financial markets (like bankruptcy penalties and taxation as exemplified by Kraus and Litzenberg (1973)), so not to be still in the Modigliani-Miller theorem’s domain (who assumed perfect capital markets and therefore the firm’s market value would be independent of its capital structure). In this sense, we should expect debt to have certain advantages for firms.

So, under this theory, a firm is portrayed as balancing the gain obtained by indebting itself (so deducting interest from the amount of taxes to be paid) and the three additional factors singled out by financial economists that limit the amount of debt financing: personal taxes, bankruptcy costs and agency costs. So, the firm is supposed to change its capital structure (so its gearing ratio) in order to have the maximization of its overall value, by having its marginal costs equals to its marginal benefits⁹. In Fig.4 there is represented the debt-equity tradeoff as portrayed by Myers (1984).

Another important contribution to this branch of the theories deriving from the capital structure studies is given by Jensen and Meckling in their 1976 work titled “*Theory of the firm: Managerial behavior, agency costs and ownership structure*” (Jensen and Meckling (1976)), in which they highlighted the problem of risk shifting and asset substitution¹⁰. Because of the limited liability for the

⁹ In his work, Myers pointed out the existence of costs of adjustments, that are costs due to the adjustment of the optimum in changing the capital structure of a firm, causing delay, so having another sign of imperfection in the market. He found a wide variation in actual debt ratios in his samples and addressed the costs of adjustment as a possible cause of heterogeneity in gearing ratios for similar firms in the same industries.

¹⁰ Here the debt, then to decide which of the investments to take, and then to sell all or part of his remaining equity claim on the market, he will not be indifferent between the two investments. The reason is that by promising to take the low variance project, selling bonds and then taking the high variance project he can transfer wealth from the (naïve) bondholders to himself as equity holder. An example is given by a simple simulation: in a world with no taxes, a manager-owned firm has the opportunity to take one of two mutually exclusive equal cost investment opportunities, being productive all the time with all the related trading markets (for debt and equity) always open. Assuming $\sigma_1^2 < \sigma_2^2$, where 1 and 2 indicate the two different investment opportunities, and assuming the covariance risk of each the distributions (in the

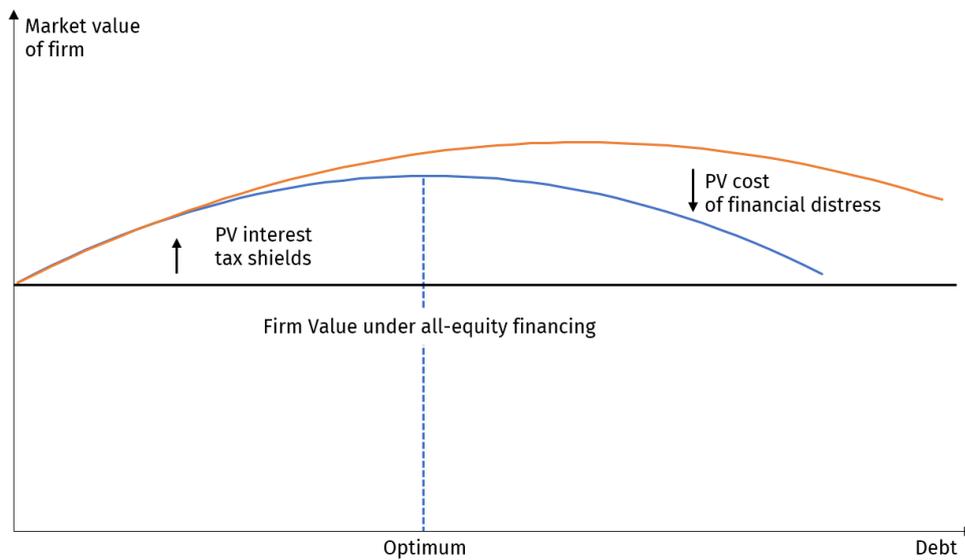


Figure 4: 1984 Myer's static-tradeoff theory of capital structure.

from Myers, Stewart C. (1984), "The capital structure puzzle.", *The journal of finance*, 39(3), 574-592.

firm, in case of default the costs are way higher for the equity holder to be paid, so the overall risk related to default linked to a certain investment is totally on the creditors. So, the higher the amount of debt, the higher the incentives for the owners and managers to take on onto risky projects, because of the risk shifting against creditors. A rational creditor would likely demand a premium on top of this added risk, so creating a cost for the firm.

Also, and more importantly, Jensen and Meckling (1976) noted in their work that firms would have always a gearing ratio < 1 , because of all the agency costs related to debt (so opportunity wealth loss, monitoring and bonding expenditures, bankruptcy and reorganization costs). Considering the overall agency costs related to the *exploitation of the outside equity holders by the owner-manager* and the total agency costs associated with the presence of debt

CAPM) to be identical, Jensen and Meckling stated that if the owner-manager has the right to decide which investment program to take, and If after he decides this he has the opportunity to sell part or all of his claims on the outcomes in the form of either debt or equity, he will be indifferent between the two investments, However, if the owner has the opportunity to *first* issue

in the ownership structure, Jensen and Meckling (1976) came to the following result, describing the optimal debt to equity ratio:

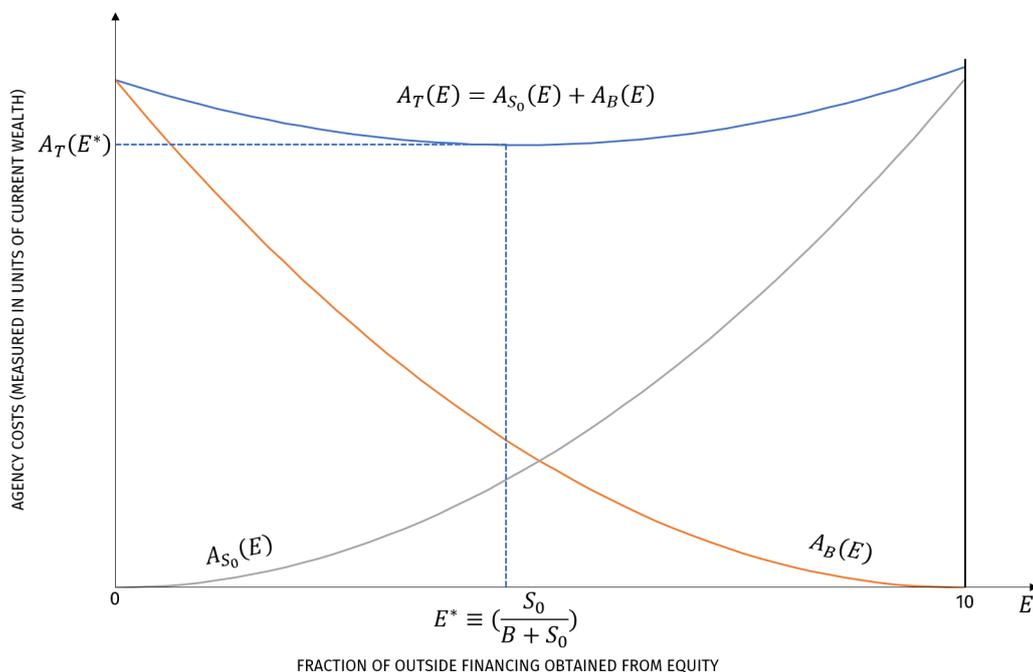


Figure 5: 1976 Jensen-Meckling argumentation on optimal capital structure determination in case of agency costs and under the trade-off hypothesis.

from Jensen, Michael C., and Meckling, William H. (1976), "Theory of the firm: Managerial behavior, agency costs and ownership structure.", *Journal of financial economics*, 3(4), 305-360

In Fig. 5 we have two separate components: $A_{S_0}(E)$ representing the total agency costs for outside equity financing and $A_B(E)$ representing the agency costs associated with debt financing, given E equals to the level of internal equity.

When $E \equiv \frac{S_0}{B+S_0} = 0$ (so there is no outside equity), the manager's incentives to go for outside equity financing is at a minimum since any variations in the total equity amount is equal to the changes in his own amount of equity (so assuming management coincident to ownership). As E increases to 100% his incentives to exploit the outside equity holders increase and hence the agency costs $A_{S_0}(E)$ increase.

The agency costs associated with the existence of debt, $A_B(E)$ are due mainly because of the value reductions in the firm and monitoring costs caused by the manager's incentive to reallocate wealth from the bondholders to himself by

increasing the value of his own equity claim. When $S_0 = E = 0$, so all outside funds are represented by debt, these agency costs are at their maximum. As the amount of debt declines to zero these costs also go to zero because as E goes to 1, his incentive to reallocate wealth from the bondholders to himself decreases, for two reasons:

- 1- The total amount of debt plunges, and therefore it is more difficult to reallocate any given amount away from the debtholders;
- 2- His share of any accomplished reallocation is falling since S_0 is rising and therefore $S_i/(S_0+S_i)$, his share of the total equity, is falling.

In Fig. 5 we can immediately note that the optimum for the leverage ratio for the firm is represented by the minimum of the equation for the total agency costs, $A_T(E)$.

So, in sum, all the variants of the tradeoff hypothesis are in accordance in stating that there is an optimal capital structure. There is no one optimal structure for every firm, but, of course, every firm has its own kind of assets composition and debt structure, which have their own costs, values and risks and time lags in adjustments¹¹.

b. The pecking order theory

The trade-off theories have in common the proposition that, while analyzing the benefits and the costs deriving from the choice between equity or debt financing, a firm can achieve an optimal capital structure.

In contrast, the pecking order theory assumes that:

- 1- Firms would go first for internal financing options, so there are preferences on which type of financing the firm should go for, and not only a merely “numerical” analysis;

¹¹ This factor is addressed in Brealey, et al. (2008). as the main factor because of which two firms with equivalent assets can be very different with respect to their capital structure.

- 2- Firms' payout ratios are tailored to the potential investment opportunities and target payout ratios move smoothly, in order to not incur into rapid and unexpected changes in dividends;
- 3- Conservative payout policies, mixed with variation in profits and return on investments lead to the fact that internal cash flows may be equivalent (or almost equivalent) to just investment expenditures. If needed, the first financing resources to be exploited would be cash or liquid securities;
- 4- In the case of needing external financing, the first option to winnow would be the safest one, so debt, then (probably) convertible bonds and so on. Equity would be the last resort. We see that here we do not have a target debt-equity mix to achieve, as the firms is more likely to follow its preferences order.

Donaldson, in his 1961 work¹² observed that *“Management strongly favored internal generation as a source of new funds even to the exclusion of external funds except for occasional unavoidable ‘bulges’¹³ in the need for funds.”*

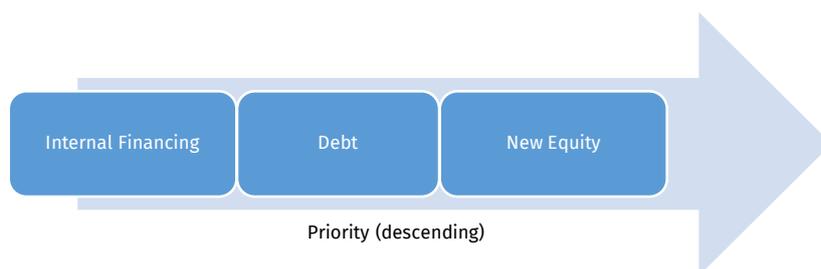


Figure 6: Pecking-order Theory priority diagram.

This proposition provided the basis for the modification occurred with Myers and Majluf in 1984¹⁴ and is strictly related with the asymmetric information phenomenon, intended as the management having superior information about the value of firm's assets and investment opportunities. The theory postulates that there exists a directly proportional relation between the grade of

¹² Donaldson (1961)

¹³ These 'bulges' where rarely met by cutting dividends, so via debt.

¹⁴ Myers and Majluf (1984).

asymmetric information in the market and the costs of financing. So there is an evident order of choice when it comes to financing for the firms:

So a firm is going to prefer internal financing as the first choice when it has to raise funds, then, when all the internal resources (represented by the financial slack – cash, liquid assets and unused borrowing power) are depleted, the firm is going to issue new debt (investment-grade) and when it is no longer sensible to issue any more debt, equity is issued¹⁵.

The pecking order theory has been popularized by Myers and Majluf (1984) where they argue that issuing new equity is the less preferred mean to raise capital because of information asymmetries between the management and the public. In this sense, a manager generally has more information on his firm with respect to the general public. Let's consider a situation in which a firm is deciding whether to issue debt or equity in order to meet an opportunity of investment (assuming the requirement for an instant raise of capital, otherwise the opportunity of investment would disappear): in case of debt financing and of a successful investment, creditors would receive a fixed payment (according to the interest rate and the type of debt issued), no matter how good the investment have been, then, the rest of the profits made thanks to the project would be all for the shareholder (the higher the yields of the investment, the higher the profits for the shareholders); if, instead, the firm is going to issue new equity, the new shareholders would participate in the gains all in the same amount, so the profits gained by the original shareholders would likely be lower than expected and, since the theory is based on the assumption that the management works mainly for the existing investors, they would be more likely better off with avoiding the entrance of new investors to share their part of

¹⁵ In Bolton, Patrick, and Mathias Dewatripont (2005), the authors noted as the order of choice established by Myers and Majluf (1984) is not necessarily the one that every firm is likely to go for. Instead, they stated that a firm will finance its investments by recurring to the one type of financing which value is less sensible with respect to the specific information that is object of the information asymmetry, so for certain kinds of information, new equity issuing could be potentially the best choice for a particular firm in a particular context.

dividends with when a positive investment opportunity appears (Myers and Majluf (1984)).

Myers and Majluf (1984) show clearly with a demonstration that, in case of favorable information by the management, it would be better to issue debt than equity and vice versa, so having the decision rule becoming “issue debt when the firm’s value is underpriced and issue equity when firm’s value is overpriced”.

This strategy seems to go along with a correct logical process, but eventually we will have opposite effects: putting ourselves in the investors’ shoes brings us to see a clear signaling issue on this matter. We, investors, know that a firm will issue equity only when seeking for an overvalued gain and debt otherwise so, in the first case, we would not be part of the issue unless the firm’s risk-free debt opportunity is exhausted.

Markets, adhering to this trend, would likely penalize new equity issue, considering that a signal that the firm has no very good prospect for the incoming investments¹⁶, and, then, firms would likely prefer debt over equity (even though this conclusion is not universally accepted by the economic literature), signaling the board’s confidence that the relative investment is profitable¹⁷.

The asymmetric information between investors and managers will also affect managers when deciding on adjustments toward optimal capital structure according to Myers (1984). If the firm will exchange debt with equity, it is considered as bad news. But if the firm instead exchanges equity with debt it is considered as good news. This even though both actions are taken with the

¹⁶ For example, ordinary stocks prices lose, generally, 2% after a new equity issue in the USA markets (Asquith, and Mullins Jr. (1986)).

¹⁷ Evidences show that in the real world, in most cases this is not applicable to industries where there are high costs of debt issue and high presence of intangibility of assets (i.e. high-tech industries – Brealey, et al. (2008)). However, tests of the pecking order theory have found that there are instances where the condition assumed by the theory itself are applied are a good approximation of reality.

same objective, to maintain or move towards an optimal amount of leverage.

c. The market timing hypothesis and the control hypothesis

Two main theories regarding how a firm might ratiocinate in decisions about its own capital structure have been discussed above. There are many other aspects and lines of thought in this regard, but we will limit ourselves to describe other two “minor” theories beyond the main two.

The market timing theory is pretty recent¹⁸ and takes some kind of distance with respect to the above mentioned theories. This particular theory is based upon the assumption of the irrationality of the market, that leads it towards inefficiencies of itself in terms of shares and debt circulation (so, for instance, the price of a share is likely to be different to the expected value). In this sense we are stepping into behavioral finance territory.

Baker and Wurgler¹⁹, claim that firms do not generally care whether they finance with debt or equity, they just choose the form of financing which, at that point in time, seems to be more valued by financial markets, not necessarily in a rational way. Let's assume there is a firm which is being overly evaluated by the market and is going to take an investment opportunity and is deciding whether to finance it with debt or with new equity: the firm is going to issue new equity because of the overvaluation (so not following the *diktat* of the pecking order theory) within an amount large enough to cover the investment and not to discontent the old investors (not seeking the tradeoff theory's optimum).

The idea that firms pay attention to market conditions in an attempt to time the market is a very old hypothesis, though the market timing hypothesis describes the behaviors of firms under the assumption that they are able to detect favorably inefficiencies better than and before the market itself and the

¹⁸See Stein (1996).

¹⁹ Baker and Wurgler (2002).

evidence to support this is pretty weak so the whole theory is a source of discordances between academics nowadays.

The control hypothesis is based on the Agency Theory²⁰, a theory primarily developed by Alchian and Demsetz²¹ and Jensen and Meckling²². According to the agency theory, firms have the power to separate ownership and control, having the first, the owners, to take all the risk of the business and the second to be exerted by the management (the agents) on behalf of the owners²³.

An agency problem arises as the compensation for the managers is correlated to the firm's turnover: as the business grows, the higher the compensation for the managers. Jensen (1986) therefore argues that managers may use cash flow to expand the firm more than necessary.

Jensen (1986) suggests the Control Hypothesis, using debt for motivating and disciplining managers in their use and control of the free cash flows at the firm disposal. In fact, managers may use substantial free cash flows for their own interest. By using debt, we would have a reduction in the free cash flows available to the managers, incentivizing them to act more efficiently

Also, with debt issuing we would have more control by the markets, which will be facing the firm and its managers on a regular basis. This kind of monitoring of the firm's opportunities and investments helps reducing the agency costs and

²⁰ Jensen (1986).

²¹ Alchian and Demsetz (1972).

²² Jensen and Meckling (1976).

²³ In Fama (1980), the author argues that managers are always maximizing their utility and this may lead to consumption at the expense of the shareholders. This conflict of interest is minimized through two markets: the market for corporate takeovers and the labor market for managers. When the firm's value increases, the market value of the managers do the same leading to increased compensation. This is the incentive for managers to act on the behalf of the firm's owners.

minimizing the problem²⁴.

²⁴ Jensen (1986) continues with the agency costs of debt, which includes bankruptcy costs. Similarly, in the Trade-off Theory there is an optimal amount of leverage with which the firm's value is maximized. This can be found where the debt's marginal costs offset the marginal benefits.

CHAPTER 3 – The bias towards debt in current taxation systems

Until now, we have discussed very briefly about the phenomenon of the debt bias and from a superficial point of view.

In fact, we have seen the topic appearing in the discussion about the capital structure in many points of the discourse, declining the presence of debt (and, moreover, of the deduction of interests from taxes) as a pure incentive for firms to indebt themselves in order to achieve maximization of the profit & losses results (and, theoretically, net profits).

We have not seen yet in detail how the phenomenon occurs and which can be the effects of it in a realistic situation and taking into consideration real world taxation frameworks.

3.1 Analyzing the debt bias phenomenon

As aforementioned in the sections and chapters before, the idea that all the phenomenon is based on is that interest expenses can be deducted, in many legal and tax systems, from the taxable income, while other kinds of resource-gathering methods cannot (one example, over the others, equity financing). This makes debt cheaper than equity, involving distortions (decisional, financial and economic) and going against the principle of neutrality with respect to sources of financing. The math behind the debt bias phenomenon is really simple: we consider a simple investment opportunity example in which there exists a project undertaken by a firm that involves an outlay of €10,000 in year 1 to acquire an asset that generates a guaranteed income of €300 in year 2, so 3% return. We suppose that there is no inflation and no depreciation for the acquired asset (for simplicity purposes). Also, we initially set no corporate income taxes for the first year and we set a risk-free interest rate of 3% per annum.

Case A):

The firm borrows €10,000 in order to finance the project. In this case we would like to expect the 3% return to cover just the interest expenses of €300 in the second year of activity. Then, the process made by selling the asset object of the investment would be used just to pay back the sum borrowed.

In this case, the overall value of the operation would be 0, so the shareholders would likely to be indifferent on undertaking the investment project or not²⁵.

Of course, if the project's yields were higher than €300, the firm would be better off if the investment is undertaken.

The situation is not different in case of the first scenario if we take corporate taxes into account. As the taxable profits would be equals to 0, so there would be no taxes to pay (instead there would be in the case of super profits – in this case profits higher than €300).

Case B):

The aforementioned investment project is undertaken by taking into consideration the option of financing it solely via equity financing.

If we do not consider corporate income taxation, the shareholders would be indifferent whether the firm undertakes the investment project or not, as if it does, after the sale of the asset at the end of year 2 the firm would have €10,300 for its shareholders. If it does not, the firm would likely have €10,000 spare to give its shareholders (because it would have not a debt to be repaid).

Of course, the corporate income taxation plays an important role. Here the firm has no interest to be deducted from the tax base, so, in year 2, it has taxable profits for €300.

²⁵ In this context, a project that just earns the required rate of return of 3% is referred to as “marginal investment”.

Assuming a corporate income tax rate of 25%, the firm would have €75 to pay in tax, leaving shareholders with a post-tax rate of return of 2,25% (instead of the initially expected 3%). In this scenario, the shareholders would be better off investing their own funds in something outside the corporate sector, in order to have a higher rate of return (avoiding taxation).

In this case it is worth to be noticed that, in order to have the acceptance from the shareholders, it would be required a guaranteed income of at least €400, so a post-tax income of €300 and a post-tax rate of return of 3%.

The cost of equity is then raised from 3% up to 4% because of the 25% corporate income tax rate.

An obvious implication results from this simple example, that is that corporate income taxation works as a deterrent for equity financing and incentive debt financing as the more convenient way to seek for investment opportunities and growth²⁶. In reality, the cost of debt tends to increase as the debt itself increases, because of the growing risk of default of the indebted firm. So, in practice, we observe firms using a mix of debt and equity finance.

	Case A: Debt Finance		Case B: Equity Finance	
	No tax	With tax	No tax	With tax
Investment - Y1	-10,000	-10,000	-10,000	-10,000
Borrowing - Y1	10,000	10,000	0	0
Income - Y2	300	300	300	300
Interest payment - Y2	-300	-300	0	0
Asset sale - Y2	10,000	10,000	10,000	10,000
Debt repayment - Y2	-10,000	-10,000	0	0
Proceeds before tax - Y2	0	0	10,300	10,300
Rate of return before tax	-	-	3%	3%
Corporate tax payment @25% - Y2	0	0	0	75
Proceeds after tax - Y2	0	0	10,300	10,225
Rate of return after tax	-	-	3%	2,25%

Table 1: Differences in the rate of return for debt financing and equity financing.

²⁶ Of course, the example is way too simplistic, as it does not take into consideration uncertainty of future scenarios and having an all-else-equals condition as a base condition.

From the government point of view, we would not want a corporate income taxation system that encourages firms to get into weak and fragile balance sheets in order to finance their growing opportunities and ordinary operations²⁷.

Another implication that raises is that the corporate income tax has as immediate effect the increase of the cost of capital, resulting in lower corporate investment.

The effect of this phenomenon is also relevant while considering borrowing an amount of money that is higher than the amount at the firm's disposal in order to invest in something in a heavier manner (thus, having a major leverage effect).

So, let us arrange another example:

Case A):

The firm has at its own disposal an amount of money equals to €10,000 that can be invested on an asset that will grant a return on investment before taxes equals to 10%. (so, having a profit before tax equals to €11,000). Assuming a tax rate of 25%, applied to the gross income of €1,000, the firm would have a net income of €750, that is equals to 7,5% as return on capital.

Case B):

Consider the same firm has, instead of financing the investment just with its own resources, the possibility to have access also to debt in a measure that is higher than the liquidity at its disposal in the previous case. So, assume that the firm now has the capability to borrow an amount of money four times the previous amount, so €40,000 at an interest rate lower than the previous return on investment before taxes, so 7,5%, plus €10,000 as the previous case. We can so imagine that the firm, having a much more consistent capital to invest on the investment project (€10,000 plus €40,000), could easily put it all onto the

²⁷ One might argue that the tax bias in favor of debt in the corporate income taxation system could be easily offset by a taxation system biased against debt in personal income taxes. This argument has little value, especially in larger companies where the shareholder base is highly fragmented and represented by tax-exempt institutions and foreign shareholders.

investment itself. At the same conditions as before, the investment would pay back as return on investment 10% of the sum invested, so the firm would have €5,000 as a gross income (before taxes) at the end of the year. The firm will have to repay the debt at the end of the year plus the interest due. The math in this case would be like this:

€10,000		Initial capital
€40,000		Amount borrowed
	-€50,000	Investment undertaken
€55,000		Asset sale (at 10% return)
	-€40,000	Debt repayment
	-€3,000	Interest payment
	-€500	Taxes (25%*€5,000-€3,000)
€11,500		Revenue
€1,500		Profit
15%		Return on investment

Table 2: Return on investment in case of debt financing case.

Here we can see clearly that the company has a return on investment that is higher than the one expected in case A. This is due to the fact that the cost of debt (in this case equals to 7.5%) is lower than the return earned on the investment (so 10%). The difference between the two is the reason why we would have a part of the total income (€1,000) and a part (€1,000) that is generated by the debt, leading to a total income of €2,000, taxed at 25%.

3.2 The rationale(s) for sources of financing discrimination

So far we have seen how it works and, further in this chapter, we will explore the consequences that the bias towards debt could make firms face²⁸ and the possible remedies brought to light by countries and governments. Instead, in this section, some possible rationales are considered as leading reasons for

²⁸ Though, nowadays, all the theories and economic rules have a relative importance in analyzing the impact of debt in an economy in which the debt bias is allowed, because of the withering borderline between all the financial instruments in the range that have a hybrid nature of debt and equity instrument.

governments to allow deliberately firms to have their financing decisions distorted.

There is no explicit reason or strong externality because of which a bias in favor of debt is required to correct a certain financial distortion, as, as we have been reported by empirical evidence, it creates itself a financial distortion that leads to liquidity constraints and financial difficulties²⁹. Also, the debt bias may have led to the issuing of complex hybrid instruments that blend characteristics of debt and equity, such as convertible bonds (having the advantages of the interest deduction of debt instruments and having other equity perks)³⁰.

As said in the previous chapters, the distinction between debt and equity is based on several criteria, but when more sophisticated instruments are involved, different criteria must be applied³¹. This is due to the fact that the features that distinct debt from equity (as mentioned in the first chapter of this work) leave considerable room for interpretation, thus, give space to arbitrage opportunities to arise (especially when different countries apply different rules

²⁹ Some may argue that the debt bias has been first created in the recent financial crisis. On the contrary, it may have aggravated it, by making bank restricting their credit supply to the public and making debt costlier in a moment of need.

Shaviro (2011), Shackelford, Shaviro and Slemrod (2010), Hemmelgarn and Nicodème (2010), Claessens, Keen and Pazarbasioglu (2010).

³⁰ In this case, we would be likely to expect poor transparency problems and issues in accountability of corporate financing policies, even though there is not empirical basis to prove it in terms of magnitude.

Fatica, Hemmelgarn and Nicodème (2013).

³¹ i.e. the degree of variability of the claim, the control of the size of the payment by the management, the priority put on cash-flows, the type of maturity (fixed or variable/infinite)

Fatica, Hemmelgarn and Nicodème (2013).

to determine whether a certain kind of financial instruments belongs more to the debt category than the equity category and vice versa³²).

Also, as pointed by de Mooij³³, using debt may be justified by corporate governance motives, e.g. in order for a parent company to control the free cash flow available to the management of a subsidiary firm, but this behavior creates enough room for international firms to exploit cross-country tax advantages by tweaking the on the capital structures of the holding's firms. Also, in an intracompany debt environment, it is more difficult to calculate the appropriate interest rate, because of the coincidence of the subjects who have to get prior and residual claims. Thus, we have the debt shifting problem.

The source of this different treatment is likely to have origin in the traditional consideration of dividends as remuneration components of a taxable income while the price of debt constitutes an ordinary business cost (this thought is also shared by the international accounting principles). This makes no sense, economically speaking and nowadays, because the consideration of both payments as a kind of return to capital is widely supported, therefore a priori reasons to tax one differently from the other one are not acceptable, logically speaking.

From a legal point of view, Devereux and Gerritsen³⁴ argue that one reason for the different tax treatment between debt and equity may rely on administrative convenient behaviors: CIT could be interpreted as a proxy for personal taxation as incomes derive from equity, so we could easily observe that a part of the income resulting from equity investments would be difficult to tax at individual level because of the typical amount of retention by the company; on the contrary, interest payments by the companies are typically in cash, and the receipts of them can be easily observed, then taxed. Following this train of thoughts, the interest paid needs not to be taxed at the corporate level (thus the

³² Schön, et al. (2009).

³³ De Mooij (2012).

³⁴ Devereux and Gerritsen (2010).

deduction, in order to the payment not to be taxed twice – at corporate level and personal level), even though there are several objections on these points that make the whole argument flawed critically³⁵. Overall, Devereux and Gerritsen (and many other authors) state that there are no objective reasons to have a different treatment between the source of financing, on the contrary, logic would call for a relatively similar tax recognition.

Until now, legal reasons to favor the bias of debt against equity financing have been listed, but there also exist economic reasons for it to happen. First of all, some may argue that the debt bias is real because of the existing market imperfections: as aforementioned, in case of complete markets and perfect information, there is no leaning towards debt against equity and vice versa for a firm, as any kind of capital structure would be efficient (Modigliani and Miller (1958)); in the real world, where markets suffer from every kind of imperfection, the debt bias is seen as a sort of mitigation system in order to keep pre-existing distortions under control. In the second place, de Mooij (2012), states that all the accepted economic theories with regards to capital structure and debt bias provide weak explanations on whether the debt levels chosen by non-financial firms are too high or too low. In this sense Gordon (2010) provides a useful insight on why debt bias could be a reasonable method to counteract the asymmetric information gap existing between investors and managers (think about the signaling effect that debt issuance creates³⁶). In their 1981 work³⁷,

³⁵ In the first place, the return on debt may result from changes in the value of the bonds of the company and not only from cash receipts, making the whole situation difficult to be taxed at personal level. Also, dividends can be paid in cash, so be taxed at individual level therefore exempted from being a part of the CIT base.

³⁶For the signaling theory, debt issuance would represent bad health for a firm. In this case, healthy firms issuing debt would be rather few. The governments, in order to improve efficient decision making, eases borrowing by these firms, simply taxing more firms with poor performances. The tax advantage of debt works in the way that the benefits are larger for firms that are healthy, so with this achievement in mind. Anyway, there is no strong support to the signaling effects of debt in the economic community.

De Mooij (2012).

³⁷ Stiglitz and Weiss (1981).

Stiglitz and Weiss formulate an hypothesis under which debt bias serves the function of debt encourager in an environment where banks are reluctant to give access to credit, because of the difficulty to verify the behaviors of borrowers³⁸.

Another point that can explain the existence of the debt bias is provided by Gordon and Bovenberg³⁹, stating that lower taxation of debt may be a solution (or a mild remedy) for the problems caused by the larger international mobility of debt with regards to the mobility of equity. Indeed, debt and equity markets have different kinds of information asymmetries inside themselves, because of the implicit nature of the financial instruments. So, given the higher perceived safety of debt (for an investor⁴⁰), debt is likely to be more easily moved internationally, so more difficult to be taxed at the source (therefore we have the debt shifting problem and the tax arbitrage opportunities that are created).

3.3 The size of the debt bias

This far we have seen that the phenomenon of the bias toward debt in corporate finance provides the basis for several immediate and side effects on individuals, single firms and industry and, moreover, on entire sectors of the national and international economies. In this section we are going to examine the amplitude of the effect of the bias towards debt under several aspects.

³⁸ Regarding this hypothesis, in their 1987 work (De Meza and Webb (1987)), De Meza and Webb developed a model regarding information asymmetry in both debt and equity markets, showing that debt bias would aggravate existing distortions. Also, there have been argued that debt bias would be likely benefit not all kind of firms to have access to credit, but just the ones that already have access to debt, so mature firms against new startups and growth firms. This because the credit rationing exposed as a cause of the debt bias to exist hits heterogeneously the firms, being heavier to the small ones and the new ones (Tirole (2010)).

³⁹ Gordon and Bovenberg (1994).

⁴⁰ In fact, a foreign equity investor may be reluctant to invest in a firm in another country because of the information asymmetry existing between him and the firm itself, having the latter better information causing a possible overcharge. Instead, debt carries different kind of risks.

So, we can say that the debt induced bias towards non-equity financing sources introduces at least two kinds of economic distortions: first, it exasperates the opportunities to debt-shift for firms, decreasing taxable incomes for the firms themselves; second, the increased level of leverage adopted by profit maximizing companies may generate a higher amount of systemic risk. We will explore deeper these arguments later in this section.

This topic gained considerable attention in recent years because of the chain-effect that the fiscal distortions of firms' capital structure may have on entire sectors, as default rates for firms increase during economic downturns because of the induced increase of leverage, so having subsequent negative impacts on the balance sheets of banks and, then, every other kind of firm ⁴¹.

In order to get a broader idea of the effects of the debt bias in the real world we put under our lenses the impact that the debt bias has with respect to leverage. As we have already seen on this paper until now, because of the debt bias, leverage tends to increase (generally speaking) the riskiness of a firm, in terms of capability to pay back debt and get access to credit (and, of course, many other aspects). As a consequence of a higher probability of default, the systemic risk tends to increase. The implicit push towards debt financing for firms can be considered an actual subsidy to financing. In this sense there exists a gap between equity financing and debt financing (in terms of convenience and profitability, because of the differences in the amount disbursed when taking on an investment), so a gap exists between equity-financed and debt financed new investments convenience.

⁴¹ Branzoli and Caiumi (2018).

This gap leads us to state that debt-financed new investments may bear a negative effective marginal tax rate (as reported in the graph below, from 2011), so they would not be profitable in case of a tax-free environment.

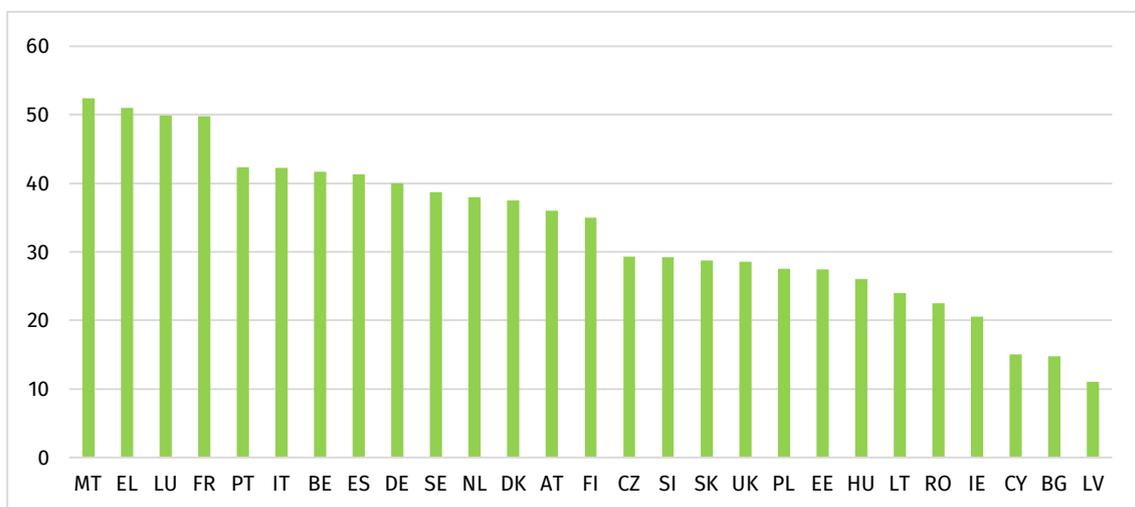


Figure 7: Gap of effective marginal tax rates (EMTR) on debt and equity financed new investments (in percentage points).

from Fatica, Serena, Hemmelgarn, Thomas, and Nicodème, Gaëtan. (2013), "The debt-equity tax bias: consequences and solutions.", *Reflets et perspectives de la vie économique*, 52(1), 5-18.

Many researches have been conducted in the regards of the debt bias phenomenon and many other are yet to be made (as we will see furthermore in this section).

Even though there are a lot of points of accordance between researchers, such as evidence on the fiscal incentives influencing the choice of financial leverage, so the existence of a positive correlation between leverage levels and corporate taxation⁴², many topics and conclusions are still obscure and dissonant between scholars. For instance, it has been recently shown that tax advantages have a role in determining financial choices⁴³, but the literature is not unanimously

⁴² Branzoli and Caiumi (2018).

⁴³ MacKie-Mason (1990) and Graham (1996).

agreeing on which factors have the major weight or on how they contribute to the firms' value⁴⁴.

In this sense, the problems that create difficulties in this branch of studies (like in many other branches related to taxation) are related mainly with data challenges due to diversity and complexity in tax codes and effectiveness of regulations. This leads to problems in quantification of corporate tax rates, quantification of the effects of interest taxation at the personal level (as we have previously seen, this is often omitted from the calculations – i.e. Miller, M. (1977)) and quantification of the costs of financial distress the firm may have to bear in case of bankruptcy.

On this argument, De Mooij provides a useful insight on the variety of studies, in order to make an attempt of normalization of the great variety of results⁴⁵. In his work, De Mooij argues that there is ample support on the debt bias argument stating the existence of the positive correlation between leverage and corporate taxation subsidies and benefits, even though these studies differ in a considerable way on representing the size of the phenomenon and are conducted within different methodologies and lines of thinking⁴⁶. Despite the contrary results obtained in the studies conducted up until the 90s (which described the impact of the debt bias on the financing decisions undertaken by firms as irrelevant, denoting either the irrelevance of the phenomenon or the

⁴⁴ Shyam-Sunder and Myers (1999) and Fama and French (1998).

⁴⁵ De Mooij (2011).

⁴⁶ In his work, De Mooij deep dives into the argument of the sensitivity of corporate taxation with respect to leverage and tax benefits (like the ones causing the debt bias). Stating that the debt bias is not a cause to the 2008 world economic crisis, but agreeing on its role in deepening it, the author also describes the debt bias as a matter of international concern, because of the creation of hybrid instruments and the possibilities of tax arbitrage, international tax planning and international debt shifting. He also investigates on how much taxation actually matters for corporate debt policies, suggesting different results whether a behavioral response is weak or strong. Previous studies asserted the insignificance of the tax effects on debt ratios, i.e. Miller in 1977 noticed how debt ratios from the 20s to the 50s were basically the same, even though taxes quintupled; also, in 1998, Myers and other described tax incentive as of third order importance in the hierarchy of corporate financial decisions.

lack of consistent results), recent observations have come to different conclusions, making the debt bias being recognized as posing a heavy stability risk in the economic systems.

Study	Data	Tax measure	Remarks	Results
Graham et al., 1998	Panel of non-financial US firms 1981-1992	Simulated MTR*	Long-term debt	Significant tax effect
Graham, 1999	Panel of US firms 1980-1994	Simulated MTR*, Miller term; PIT control	Regressions by firm groups and years	PIT matters, estimate for Miller tax term differs from CIT
Gordon and Lee, 2001	Panel of US firms 1954-1995	Simulated MTR* minus PIT on interest	Panel and time series estimates; distinction short- and long-term debt	Larger effect for: 1- Time series regressions; 2- Short-term debt 3- Either small or large firms
Jog and Tang, 2001	Panel of Canadian firms 1984-1994	Statutory CIT change during this period in Canada and US	Distinguish domestic and foreign controlled firms	Canadian firms without foreign affiliates are more responsive
Bartholdy and Mateus, 2006	Panel of Portuguese firms 1990-2000	Simulated MTR*	Distinguish long- and short-term debt	Larger effect on short-term debt, insignificant for long-term debt
Gordon and Lee, 2007	Panel of US firms 1950-2000	Simulated MTR* minus PIT on interest divided by (1 - MTR)	Interaction with interest rates	Interest rates matter for tax effects
Dwenger and Steiner, 2009	Cross-section in German firms 1998 and 2001	ATR* in 2001 relative to 1998	Long-term debt; different sized firms, risk groups and profit levels	Relatively large effects for large firms and more profitable firms
*MTR = Marginal Tax Rate based on simulations; ATR = Average Tax Rate based on either data or simulations				

Table 3: Summary of studies using single country data.

from De Mooij, Ruud A. (2011), "The tax elasticity of corporate debt: a synthesis of size and variations.", (No. 11-95). International Monetary Fund.

Study	Data	Tax measure	Remarks	Results
Booth et al., 2001	Cross-section of 17 countries	Miller tax term	Long and short term debt	Significant and insignificant effects
Altshuler and Grubert, 2003	US firms with foreign affiliates 1996	Statutory CIT rates abroad	Internal and external debt	Significant for internal, mixed for external debt
Desai et al., 2004	US affiliates 1982-1994 in 150 countries	ATR paid in subsidiary countries	Total, internal and external debt	Similar elasticities for internal and external debt
Mills and Newberry, 2004	US firms 1987-1996 with parents in 16 countries	ATR and statutory CIT rate in parent country	Large non-financial subsidiaries	Significant effects, largest for statutory CIT
Mintz and Weichenrieder, 2005	German parents 1996-2002 investing in 68 countries	Statutory CIT of foreign affiliates	Wholly and partly owned, linear and quadratic	Large effects for wholly-owned subsidiaries
Ramb and Weichenrieder, 2005	German affiliates of foreign parents in 69 countries 1996-2001	Statutory CIT rate of Germany and foreign parents	Directly/indirectly owned	Only significant for profitable and directly owned firms
Moore and Ruane, 2005	EU multinationals between 2000 and 2003	ATR, Statutory CIT and AETR per country	Control for regime of double tax relief	Significant effects for all taxes
Buettner et al., 2006	German parents 1996-2004 investing in 24 countries	Statutory CIT rate in subsidiary countries	Explore impact of thin-cap ⁴⁷ rules in cross-country panel	Significant tax effects, moderated by thin-cap rules
Overesch and Wamser, 2006	German parents 1996-2004 investing in 31 countries	Statutory CIT rate in subsidiary countries	Internal debt; control for thin capitalization rules	Significant effects, mitigated by German thin-cap rules
Huizinga et al., 2008	EU multinationals investing in 33 countries	Marginal tax, Statutory CIT differential and withholding taxes	Subgroups, marginal tax and tax differences	Significant effects of marginal and tax differences
Buettner et al., 2009	German parents 1996-2004 investing in 24 countries	Statutory CIT rate in subsidiary countries	Distinguish internal and external debt	Significant effects for both types of debt
Buettner and Wamser, 2009	German parents 1996-2005 investing in 174 countries	Statutory CIT rate in subsidiary countries	Internal debt; majority-owned and controlled foreign corporations	Significant but small effects on internal debt

*ATR = Average Tax Rate based on data; AETR = Average Effective Tax Rate based on simulations.

Table 4: Summary of studies using cross-country variation.

from De Mooij, Ruud A. (2011), "The tax elasticity of corporate debt: a synthesis of size and variations.", (No. 11-95). International Monetary Fund.

⁴⁷ With the term "thin capitalization" we refer to a high level of debt with respect to equity of a firm. Because of the tax deduction being allowed in most tax systems, multinational groups structure their financing arrangements to maximize the benefits, by constructing a tax-efficient mixture of debt and equity in

	N° of observations	Mean Tax Elasticity
Variation in debt variables		
Leverage-asset ratio	36	0.64
Debt-asset ratio	87	0.78
Internal debt	90	0.64
External debt	42	0.40
Long-term debt	9	0.40
Short-term debt	6	1.36
Variation between countries		
Parent/firm in the US	99	0.60
Parent/firm in Germany	102	0.63
Parent/firm in Portugal	3	2.33
Parent/firm in Canada	12	1.37
Parent/firm varies/unknown	51	0.54

Table 5: Analysis of Variation of the Tax Elasticity of Debt.

from De Mooij, Ruud A. (2011), "The tax elasticity of corporate debt: a synthesis of size and variations.", (No. 11-95). International Monetary Fund.

The results above, obtained by the analysis run by De Mooij (2011) on other 19 studies, give us room to make some observations: in the first place, having a mean tax elasticity in the leverage-asset ratio equals to 0.64 allows us to say that the literature agrees on the existence and the consistence of the debt bias ⁴⁸; also, we can say that internal debt is more sensible to variation in the tax rate than the external debt and short-term debt financing is way more responsive than long-term debt financing.

Without entering actively in the specific argument of financial corporations (i.e. banks) vs non-financial corporations, we can say that the literature is confident in stating that the financial sector is more influenced by the debt bias than the non-financial sector. In this sense, many studies have been conducted. For

borrowing countries and by influencing the tax levels of the lender firm (e.g. by having the interest received in a country which does not tax interest incomes or tax them at a low rate). The Thin Capitalization Rules are measures applied by a state in order to limit tax deductibility of interest beyond a certain debt ratio.

OECD (2012).

⁴⁸ A mean tax elasticity of 0.64 means that a 10% increase in the tax rate would lead to an increase in leverage by 6.4%.

example, a work by Keen and De Mooij ⁴⁹ presents findings reporting a higher leverage ratios for financial institutions than non-financial ones, denoting an acuter behavior and responses for the further than the latter with respect to a variation in the tax rates. Operating at a higher leverage level than non-financial firms⁵⁰, banks and other financial firms have lower buffers to deal with adverse shocks (Luca and Tieman (2016)). Regarding the systemic risk that this issue brings in, the financial sector has a more relevant systemic importance than the other economic sectors, being accompanied by negative externalities and other social costs (subsequent to an eventual distress) that are not always taken into account by the financial firms.⁵¹

In their work, Luca and Tieman found that the financial sector's sensitivity to taxation (as the one of non-financial sector, though, in different shapes and sizes) has been changing because of the global financial crisis, even though the debt bias is still a relevant matter for the reasons above.

⁴⁹ Keen and De Mooij (2012).

⁵⁰ The average leverage ratio within banks and other financial institutions is 87-88%, while it floats between 40 and 60% for non-financial firms. The higher leverage ratio of banks and financial firms is due also to the facts that their financing decisions may be driven by specific regulatory requirements.

Fatica, Hemmelgarn and Nicodème (2013), De Mooij (2011), Luca and Tieman (2016) and Langedijk, et al. (2014).

⁵¹ In the period 2008-2012, the European Union provided a huge emergency support to banks and in general to the whole financial system in order to prevent it from collapsing, because of the GFC. The amount of financial aids provided by the EU is about € 906 billion, that is about 7.7% of EU 2012 GDP.

Then, the capital at banks' disposal was not enough to cover losses and prevent panic in the financial sector. As said, banks and financial institutions are more prone to leverage with respect to non-financial firms and this may have worsened the situation, making room for contagion risks and default possibilities. Again, debt bias is not seen as a cause of the GFC, but as a worsening factor, as it acted encouraging firms to leverage. Instead, as we will see again later in this work, removing the debt bias would have been encouraging to banks and other firms to increase capital and reduce debt financing.

Langedijk, et al. (2014).

Indeed, firms in general have been focusing on rebuilding their buffers and strengthening their structure in the post-crisis period. This, together with a tighter regulation (which became the main driver for a lot of firms' leverage decisions against the superior profitability given by debt), higher market pressures, a lower interest environment and an increased control and supervision of the matter, has been capable of weakening the effect of the distortion. Their results are in line with the analysis conducted previously by De Mooij and Keen ⁵².

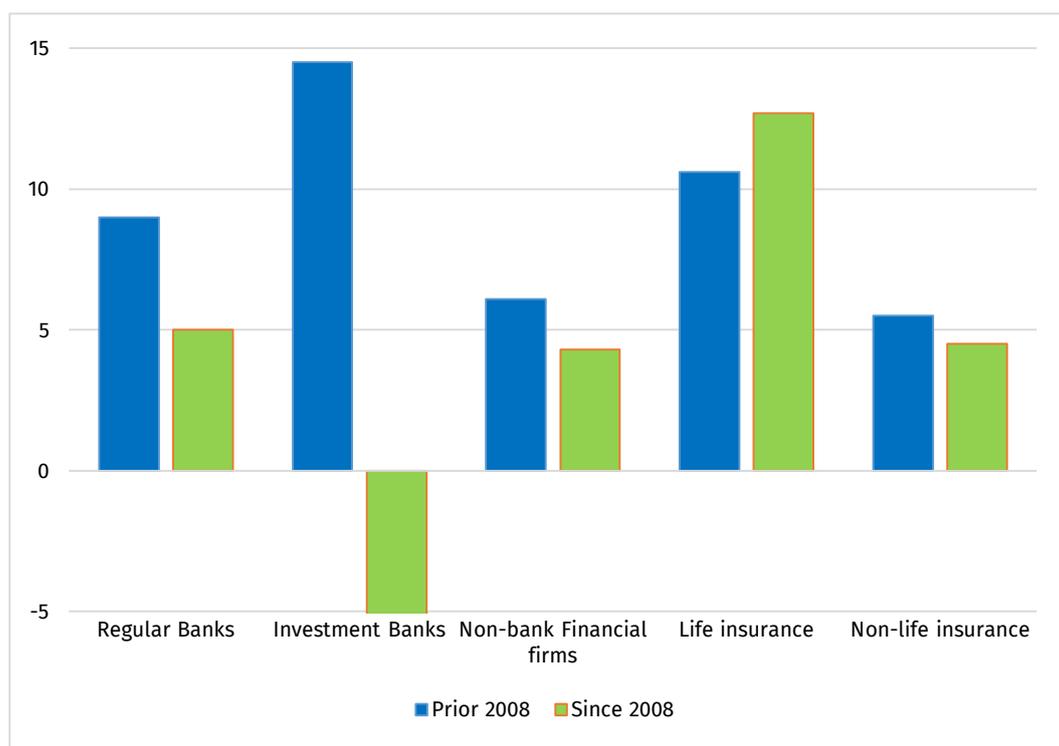


Figure 8: Contribution of the debt bias to leverage (in percentage point of leverage).

from Keen, Michael, and de Mooij, Ruud A. (2012), "Debt, taxes, and banks.", (No. 12-48). International Monetary Fund.

In general, we have seen that the large economic effects that are produced by the debt bias come with several consequences as far as the systemic risk of the markets (financial and non-financial). Several studies have been conducted in order to analyze even in a quantitative manner the impact on the systemic risk brought in by the debt bias. For example, Adrian and Brunnermeier (2011), quantify the contribution of a distressed institution to the systemic risk (or, in

⁵² Keen and De Mooij (2012).

general, the contribution of leverage) finding that *“the coefficient of -0.164 for the leverage forecast at the two-year horizon implies that an increase in leverage (say, from 15 to 16) of an institution is associated with an increase in systemic risk of 16.4 basis points of quarterly asset returns at the 5% systemic risk level. For an institution that has \$1 trillion of total market-valued assets, this translates into \$164 billions of systemic risk contribution”*.

Debt bias has a consequent impact also on the welfare system. The welfare costs generated by the tax distortion have been estimated in several studies, even though the main estimates conducted until now have been pointed out as lacking of consideration of the heterogeneity of firms throughout the markets (the studies have been taking into consideration a representative firm in order to estimate the effects of debt bias in a general way, while different firms may underline different responses and then different subsequent welfare costs). Also, de Mooij (2011) pointed out that the literature, back then, did not include larger welfare costs deriving from negative externalities excessive debt usage, such as the aforementioned increase in systemic risk, increased probability of default of firms and the social costs related to variation in the business cycles. Eventually, distortions driven by tax arbitrage and administrative costs have not been considered. Then, as a consequence, the welfare costs generated by the debt bias can be considered as higher than described in the literature because of the lack of all the elements mentioned above. Indeed, Weichenrieder and Klautke (2008) estimated the deadweight loss of the tax distortion at between 0.08% and 0.23% of GDP, while in Gordon (2010) estimated it at about 0.25% of GDP.

These results seem modest. That is because, as said, negative externalities are not considered (especially in the financial sector, where the usage of debt is much larger than the one in the non-financial sectors) as well as pre-existing distortions. By considering debt levels as efficient we minimize a consistent part of the impact of the debt bias as a welfare cost. For example, by being backed by government guarantees, banks can commit themselves on moral hazards and excessive risk taking, while choosing low capital ratios. As said, the consequences can be contagious to other banks and then having a substantial

impact on the several markets and systems in case of distress or failure (the precise costs of the increased risk of the markets is difficult to put on numbers, but the recent financial crisis suggests that they can be huge⁵³).

As mentioned above, the debt bias leads firms to seek for tax arbitrage opportunities that come along with administrative and compliance costs, while undermining the revenues (for the country) generated by CITs. This happens when companies can choose where to be taxed in order to get taxed the less. Nowadays, most countries do not tax dividend incomes deriving from foreign sources at corporate level because of the taxation happening at the origin country, while the interest incomes happening in the foreign country is taxed at corporate level, because in the country of origin the taxation does not apply, in this case. So, knowing which kind of income is taxed and where it is taxed, a firm can finance its subsidiaries with debt or equity, depending on whether it would be taxed abroad or not. Also, having differences from country to country in legal definitions and law and tax codes makes the opportunity for international tax arbitrage even bigger. By eroding the taxable base, arbitrage is a matter of concerns especially in international contexts, where high-tax countries experience substantial welfare losses (and, of course, low-tax countries receive a substantial taxable income from the inflow of capitals). Here the welfare costs can be represented also by the difficulties for the governments to raise funds because of the “tax competition” that can generate between countries in order to catch the most of the international mobile capitals. The tax gap between international and national flows can also represent an incentive to invest capitals abroad.

In this sense many countries have tried to overcome the threat of international tax arbitrage (and debt bias in general, with all of its effects) by applying limitations to the interest reliefs in order to mitigate the distortion of debt bias (e.g. thin capitalization rules – as we have seen before and will investigate further in this work).

⁵³ De Mooij (2012).

Another distortion we get as a consequence of debt bias is a welfare cost represented by the increased difficulty for young and risky firms to get access to credit. Due to the high cost of debt, these firms have to rely mainly to equity capital, so having an overall higher cost of capital with respect to similar businesses with easier access to credit ⁵⁴.

⁵⁴ This problem can be partially offset thanks to the existence of hybrid instruments that allow the firms to exploit the advantages of both equity and debt financing (e.g. convertible bonds). However, the large usage of these financial instruments leads to an increase in complexity for financial arrangements and then an increase in administrative costs.

Devereux and Gerritsen (2010).

CHAPTER 4 – Overview of the solutions and the possible remedies

It is common knowledge that almost all the economic communities have been hit hard by the 2008 global financial crisis. The crisis started in the U.S. in 2007 and has been followed by, as stated by the IMF ⁵⁵, the most serious economic downturn since the Great Depression in the 30s: the Great Recession, which lasted until the early 2010s (of course with different timing and scales from a country to another), but has been affecting economies around the world since then and resulted in several attempts to address the problems encountered, with different outcomes (such as Basel III).

In this work we will not deep dive into the global financial crisis and examine all the aspects that caused it in detail, nor we are going to focus on all the consequences it provoked. In fact, we will explore broadly the causes of the global financial crisis in order to link them to the tax debt bias, thus, we will put our lenses on the reforms that have been put into practice, have been dismantled or taken into considerations by regulatory organizations around the world.

4.1 The causes of the global financial crisis

There are several narratives of the global financial crisis which try to put the pieces together and provide a complete explanation of the causes of the crisis.

⁵⁵ International Monetary Fund (2009).

Here the IMF presented an analysis on the values that determined the crises in 1975, 1982, 1991 and 2007 in order to state whether or not the world would going to enter a recession using a statistical approach. Here an explanation on why the economic downturn started in the U.S. have been so viral that it affected the global economy is provided in terms of spillover effect, granted thanks to the massive integration between countries (rather than some sort of insulation from the contagion back in the 60s) which lead to synchronized movements in the business cycles.

In almost all of these works there are overlapping elements that caused the crisis per se or exacerbated existing or immediately subsequent problems. One upon all the others, the report made by the Financial Crisis Inquiry Commission⁵⁶ “*endeavors to expose the facts, identify responsibility, unravel myths, and help [...] understand how the crisis could have been avoided*”. The Commission concludes that the crisis could have been avoided, but has been triggered mainly by the bursting of the housing bubble⁵⁷, which affected the rest of the economy (that was contemporarily becoming larger but more fragile, because of the deregulation processes that have been led since the 1970s onward) has been preeminently caused by:

- Widely distributed failures in the financial regulation and supervision systems, which destabilized heavily the national (and, then, international) financial markets;
- The inability of the U.S. Federal Reserve to limit the negative effects of toxic mortgages;
- important problems in corporate governance (with respect to publicly traded companies) and risk management (also at systemically relevant financial institutions) played a key role in the genesis of the crisis, as too many financial firms acted irresponsibly and overlooking risks;
- an explosive mix of excessive leverage, doubtful investments and lack of transparency set a fertile ground for the crisis to grow;
- key policy makers and regulators were not ready to deal with the crisis, as they provided inconsistent and inadequate responses, denoting a

⁵⁶ Financial Crisis Inquiry Commission (2011).

⁵⁷ Thanks to significant inflows in the housing markets (because of the Russian Debt Crisis and Asian Financial Crisis in the previous years), the housing construction sector entered a boom period, in which a too easy access to credit to households was allowed, making the prices rise and making households get way too indebted and risk more than they would normally do, leaving them unbuffered in case of prices slumping. The fall of housing prices made houses worth less than the related mortgages, leading banks to enter foreclosure. It all resulted in an epidemic phenomenon that caused great losses in wealth for households and spilled over all the other parts of the economy.

incomplete understanding of the financial system they were supposed to supervise;

- general ruptures in the accountability and ethical integrity underlying arrangements.

In addition to these points, there have been identified as co-causes the loosened lending standards, which helped the crisis to be dangerously contagious, the proliferation of non-transparent financial instruments, over-the-counter derivatives and the botches of credit rating agencies, which acted as *cogs in the wheel of financial destruction*.

Even though, according to the majority of the literature about the causes of the global financial crisis, there is no strong causal link between tax systems and the global financial crisis itself (instead, is thought to be not so relevant), it has been unanimously stated that the tax systems all around the world have been deepening the effects of the crisis by encouraging the wrong behaviors (which is the very case of the debt bias) or not limiting preexisting ones, although there are examples in which the tax system have been pointing to the right direction, uselessly, denoting the lack of a solid link between taxes and the crisis⁵⁸.

In this sense, we can clearly see how the debt bias acted as an amplifier when dealing with the excessive leverage matter, both for corporate finance and households related investment decisions⁵⁹. As it has been stated before, the stability risks set by the debt bias have been proven to be consistent⁶⁰ in both

⁵⁸ This is the case for tax systems including graduated marginal tax rates and loss nonrefundability. As Shaviro (2011) points, these are instruments which purpose is to discourage excessively risky behaviors, so preventing excessive leverage, absurd risk-taking and governance issues.

⁵⁹ As for the latter, income tax systems as the one in the U.S. back in the pre-crisis period favored home ownership, exacerbating the next effects of the housing bubble burst.

⁶⁰ Some may state that a matter of concern in this matter is given by debt shifting instead of just debt bias. In fact, taking into account the risk-sharing factor that is present when dealing with multinational corporations that do tax planning activities in order to exploit the perks of the debt bias, we can see that debt shifting is likely to be relegated within the multinational company's boundaries, thus, having limited stability implications for the economic system.

financial and non-financial sectors. Especially in the further, the concerns are real, because of the major externalities that could erupt in case of failure. On one hand, regulatory organizations require financial institutions (banks and non-banks) to hold more capital as for buffers while on the other hand tax codes put their efforts on the opposite direction, incentivizing them to be low capitalized, thus, more at risk of default. These issues are even more important when taking into consideration shadow banking activities (and other non-banking financial activities), which have been playing a crucial role into spreading the negative effects that excessive leverage have caused in triggering the financial crisis ⁶¹, because of the loose accountability and monitoring standards affecting them. The relevance of the externalities of the financial sector in case of failure have been analyzed in the context of the debt bias elimination by De Mooij, Keen, Orihara, Langedijk and others ⁶² which have reported, respectively, a diminished probability of crisis up to 40% if, at the leverage ratios associated with banks in 2008, there was no debt bias and a reduction of the expected direct bailout costs between 17% and 77% within the same proposition.

In their work, De Mooij, Keen and Orihara syllogistically and empirically link debt bias (and, by extension) to the probability of crisis thanks to its connection with increasing leverage and the increase of probability of crisis because of the excessive leverage itself, especially for the banking sector. They found that a greater tax bias is associated with higher aggregate bank leverage, turning into a

International Monetary Fund (2016).

⁶¹ In some countries, the total amount of assets held by the non-bank financial is even larger than the banking sector itself.

International Monetary Fund (2016).

⁶² De Mooij, Keen and Orihara (2013) and Langedijk, et al. (2014).

greater probability of crisis. All of this in a context of welfare gains that can be obtained by policies of which we will discuss later on this work ⁶³.

In the graph below, the effects of debt bias in the triggering of a financial crisis are shown.

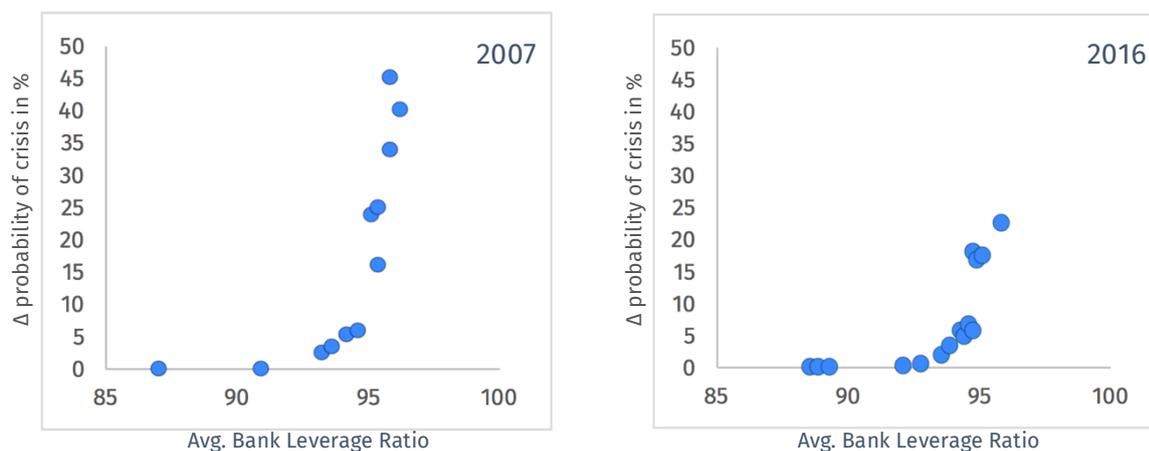


Figure 9: Effect of debt bias on probability of crisis.

from International Monetary Fund. (2016), "Tax policy, leverage and macroeconomic stability.", IMF Policy Papers. Simulations, based on De Mooij, Keen and Orihara (2014).

Obviously, by favoring debt financing over equity financing, thus increasing bankruptcy probability for firms, the tax systems have been fueling the crisis by increasing the chained effect of bankruptcy when applied to an integrated economic environment. Again, even though the debt bias is not seen as relevantly dangerous in triggering the financial crisis by causing leverage levels that would not have been reached otherwise, it is seen potentially pernicious enough to be a matter of addressing by recent institutions' agendas.

The debt bias is linked also to the governance and risk taking problems that are recognized as co-causes of the global financial crisis. Indeed, excessive leverage was an input to one of the fundamental causes of the crisis, which was represented by hugely risky strategies pursued by many publicly traded

⁶³ Oppositely to previous works, their work takes into considerations financial stability when dealing with alleviating policies with respect to debt bias and financial crises, suggesting a major impact of themselves to welfare.

companies⁶⁴. By a non-tax point of view, these public companies pursuing very risky strategies were primarily guided by *irrationality, bubble psychology, herd behavior and badly misdirected incentives* (Shaviro (2011)), as they were likely to made risky bets even if they would turn out to have negative expected social payoffs. Also, managers were highly protected with limited responsibility rules, allowing them to take on in investments that followed the saying “heads I win, tails you lose”⁶⁵. Anyway, even though some tax systems were likely to discourage these behaviors with nonrefundability rules and specifically limiting designed loss carrybacks and (more extended) carryforwards⁶⁶, the debt bias acted as an incentive to get leveraged and take on risky bets by misdirecting companies’ financial decisions to wrong instruments in order to pursue, other than the economic advantages that the favorable tax treatment of debt gives with respect to equity, decreasing agency costs for the investors (that, given the difficulty to carefully monitor their manager, would limit their potential loss). The rationale for this is connected to the exasperation of corporate governance issues provided by the tax systems, for example allowing tax sheltering

⁶⁴ Duarte et al. (2006) compared these strategies as picking up nickels in front of a steamroller. This terms indicate a strategy under which a firm could earn small positive returns the majority of the times, but may be hit by dramatic losses and socially costly collapses from time to time.

⁶⁵ In addition, the relatively short periods of time in which managers could earn a lot of money added to their capability to move easily and quickly from a firm to another emptied them from every sense of accountability for a firm likely to experience the “steamroller” a few years after their parting. Anyway, it is commonly acknowledged that the equity-based compensation and performance related systems that were adopted in most publicly traded firms was one of the causes of the excessive risk-taking behaviors of managers in those years.

Ceriani, et al. (2011).

⁶⁶ With these rules, companies would likely to reevaluate the expected outcome of their gambles, because, in case of win, they would pay taxes at the statutory rate, otherwise they would not get refunded by the government. Instead they would get limited loss carrybacks and extended carryforwards (so extended that, in some cases, they were never got exploited). Anyway, these solutions do not come without any issues: for example, there have been proven the actual risk of “zombie” firms, kept alive by the extended carryforwards of losses.

Shaviro (2011).

strategies that would lead managers to seek a reduced transparency to the eyes of investors, shareholders and regulatory organizations, especially when dealing with financial firms (which are knowingly more difficult to monitor and assess with regards to their economic performance). In this sense, the usage of hybrid instruments, coherently with the progress within the field of financial innovation (driven by *new ways to allocate risk and tax avoidance*⁶⁷), led to significant CIT revenue losses, increased overall complexity and tax distortions which had a role in boosting the imminence of the crisis.

The preamble above is to state that, even though taxes (and the debt bias in particular) have been recognized empirically as not the primary caused that triggered the global financial crisis and the Great Recession in the recent years, they were a matter of concern in the previous years. After seeing the deepening, worsening and prolonging effects that tax systems' preexisting issues have caused to the crisis, the motives of seeking for an effective tax reform aiming to more tax neutrality are solidier than ever.

4.2 The aftermath of the global financial crisis

After the global financial crisis, many of the points discussed and recognized as problems until now have been taking part to the most of the world's regulatory and financial institutions' agendas. In particular, Basel III regulatory framework has set new standards with respect to the banking and financial sector. Specifically, Basel III's aim is to strengthen both the amount and the soundness of the equity buffers required to be hold by banks and financial institutions, in order not to incur again in a financial crisis because of the same reasons⁶⁸.

⁶⁷ Cottarelli (2009).

⁶⁸ However, the new standards adopted as for minimum capital requirements for banks and financial institutions would have not been adequate in the pre-crisis period in order to fully absorb the shocks of the GFC. Also, there have been proved smaller effects of tax biases on financial institutions in the period right after the GFC, maybe due to an urgent need to rebuild buffers in order to meet the new regulatory constraints and the market pressure, but they might have been transitory, as the financial institutions' leverage sensitivity to taxes remains positive.

Anyway, there is plenty of work left to do in order to reach tax neutrality for debt and equity financing, or at least to reach a less disruptive and risky tax distortion. Indeed, even though tax biases to debt finance are targeted by many countries trying to mitigate them (for example, in the European Semester debt bias related issues are continuously addressed by the European Commission), tax codes continue to put firms at higher risk of default by incentivizing debt over equity. Also, in the context of increasingly integrated and interconnected non-banks financial institutions and shadow banks (which, as mentioned, are less strictly regulated than normal banks, so can operate at higher leverage levels), always reputed less relevant in terms of systemic effects, the risks that may generate from tax biases are more important than ever.

Indeed, since the global financial crisis the regulatory organizations around the world began monitoring leverage in a more cautious manner, as it has become a priority to become more aware and prepared for the worst, especially with regards to the externalities that may arise in the case of another financial crisis because of the spillover effects (for example, Basel III accords are meant to get the banking sector more prone to shocks, less likely to default and, in case, more resilient). As for the debt bias, it is still significant in many tax systems, although its extent varies from country to country and between sectors, industries and firms.

4.3 Policy responses overview and implications

The aftermath of the global financial crisis has awakened the behavioral response of the governments and regulatory institutions towards debt bias and related topics such as debt shifting.

Throughout the years, especially since the GFC, governments all over the world have been adopting different methods in order to address debt bias and reach for tax neutrality, or at least for less disruptive and distortive tax systems.

International Monetary Fund (2016) and Luca and Tieman (2016).

In this section we analyze the main policy responses that have been tried and adopted (some then dismissed, some refined), comparing them one to another and drawing some conclusions.

Broadly speaking, there are two schools of thought according to which governments have tried to reduce or eliminate debt bias which move exactly in opposite directions. While both deal with interest taxation, the first's proposal refers to one or more restrictions on interest deductibility, treating debt more similarly to how governments treat equity, while the second's aims to introduce more deduction possibilities (especially associated with movements in the amount of equity occurring during the reference period) in order to offset the preferential treatment of debt. Throughout the years we have seen many of those methods adopted whether staying in the extreme ends of the schools of thought or implementing systems which take the best of both worlds and try to exploit all the perks.

Interest Deductibility Limitations	TCR and Earnings-stripping rules
	CBIT
	R-Base Cash Flow taxes and R+F Base Cash flow taxes
Deductions for corporate equity/capital	ACE
	ACC
	COCA
Others	Dividend imputation, dividend exemption, lower corporate rates

Table 6: Policy options to contrast debt bias.

First, we examine the line of thought regarding remedies and proposals to address debt bias which is inclined towards a restriction (total, partial or sectoral) of interest deductibility.

1. Thin Capitalization Rules.

Among all the options that are available to countries in order to correct debt bias and its distortions, the Thin Capitalization Rules (TCRs) are amongst the most used ones. Their form and usage vary from one country to another, the principle is basically the same: TCRs are restraints on the amount of interest paid by companies that can be deducted from the taxable base beyond a certain fixed level of debt or interest. In doing so, TCRs are believed to raise the effective cost of debt financing for firms, thus acting as a disincentive to excessive leverage.

Thin Capitalization Rules were first introduced in Canada in 1971 and have been developing heavily during the 1990s (nowadays about 60 countries have adopted them) and, as stated above, can get different forms and are tweaked by governments according to different principles. So TCRs can vary in the definition of the fixed level, can allow or deny exemptions and carry forward opportunities for unexploited interest amounts. Also, different TCRs can comprise just the internal debt (so the intracompany borrowing) or the external financing too. An important distinction between different types of TCRs is given by what the fixed ratio refers to, which can be debt-to-equity or interest-to-earnings (so called *earnings-stripping rule*, of which we will discuss later in this section).

So we can say that Thin Capitalization Rules work according to one of two main approaches (or to a mean of the two): first, they can be designed so that a fixed level of maximum debt on which a deduction is allowed; second, the maximum amount of interest that is allowed to be deducted is related to another variable (e.g. the ratio of interest to earnings, as above).

The first approach is again splittable in two sub-categories:

- 1) the “arm’s length” principle (which is a focal point of the G20/OECD Guidelines discussed below), according to which the top amount of debt that can incur into a deduction for the paid and payable interest is equal to the amount of debt that a third party lender would be willing to lend to a firm. The obvious advantage of this approach is that it can result into a pretty precise representation of the indebteding capabilities of a firm, removing preferential treatments between a multinational’s affiliates and external firms. Anyway, there is a huge drawback, represented by the fact that, in order to apply the arm’s length approach, tax auditors and authorities have to gain enough expertise to fully understand lenders’ lending processes and establish the right amount of debt (also, a certain degree of judgment is inevitably involved).
- 2) pre-fixed ratio approach. Here the maximum deduction allowed is set a priori in relation to a specified ratio, such as Debt/Equity, which can be different from country to country as there is no unanimity on the ratio value itself. This approach provides great certainty and is simpler to adopt with respect to the arm’s length approach, while it could not fully represent the economic situation, because it does not take into account markets’ dynamics and industries’ idiosyncrasies. Below a simple example to explain how this mechanism works.

Capital Structure of Company X is Equity=100 and Debt=900 (at 10% interest rate)		
End of FY:	Without fixed ratio	With 3:1 fixed ratio
EBITDA	200	200
Limits on deduction of interest	-	3x100=300
Deduction of interest payments	900x10%=90	300x10%=30
Taxable profit (at 30% tax rate)	200-90=110	200-30=170
Tax revenues (at 30% tax rate)	33	51

Table 7: TCRs with fixed ratio.

The second approach, which takes into account a separate variable in order to calculate the maximum amount of interest that can be deducted, gives light to a particular case of TCR under the definition of *earnings-stripping rule*. With this term we refer to rules that limit the deduction of interest available for a firm if the the total amount of interest expenses exceeds a prefixed percentage of earnings (e.g. EBITDA – in a percentage that can be set by countries within a range of 10-30%).

Capital Structure of Company X is Equity=100 and Debt=900 (at 10% interest rate)		
End of FY:	Without earnings-stripping rule	With 30% of EBITDA limit
EBITDA	200	200
Limits on deduction of interest	-	200x30%=60
Deduction of interest payments	900x10%=90	60
Taxable profit (at 30% tax rate)	200-90=110	200-60=140
Tax revenues	33	42

Table 8: Earnings-stripping rule.

An earnings-stripping rule so takes into account values that have a more variable nature per se, which can be a misleading representation of a firm's capital structure and can be oppressing not only to highly leveraged firms, but

also to firms within a low-earnings transitory situation⁶⁹. Also, according to the G20/OECD guidelines, the so called group ratio rule, under which the maximum extent to which the deduction of interests is possible is given by the net interest/EBITDA ratio of a related party, assuming that it is below or equal to the one of the global group, coherently with the debt shifting addressing strategies set by the BEPS Action Plan (which, in this case, would not consider debt bias as the top limit for the negation of interest deductibility would be given by the group debt).

De Mooij and Hebous (2017) analyzed TCRs in order to find a link between the capability of TCRs themselves to reduce debt bias and found that there is an effective reduction of debt ratios when restrictions are set for all debt (by, on average, 5 percentage points), whilst the effects are way more reduced when the cap is imposed on just the intracompany debt. Also, they found that TCRs have a major impact on larger industries with a lot of tangible assets (because of the ease of access to debt using tangible assets as collateral), reducing their likelihood of financial distress. TCRs that hit just internal debt are designed just as an attempt of the country which adopts them to limit debt shifting by multinational corporations and have little effect on leverage.

They suggest eventually that a country which is going to introduce TCRs to address the debt bias and its related stability issues would be better off designing them to comprehend all debt instead of just related-party debt in order to address economic stability concerns (which would not be influenced by a TCR designed only to affect internal debt ratios). These considerations are not in line with the new G20/OECD guidelines that propose a framework according to which a country should design its own TCRs. These guidelines focus primarily on solving debt shifting issues rather than debt bias concerns⁷⁰.

⁶⁹ A fixed-ratio rule, instead, takes into account values that are more related to the possibility of financial distress (so debt and equity) in case of high structural leverage and is less prone to be influenced by cyclical fluctuations than an earnings-stripping rule and so, less likely to create financial issues for firms.

⁷⁰ As for the topic of debt shifting, it is worth noting the recent BEPS Action Plan (BEPS stands for *Base Erosion and Profit Shifting*), which consists of several measures developed and then adopted after the 2012

Obviously, with TCRs there are valuable, as by allowing just a fixed portion of the, otherwise whole, amount of interest to be deducted they offset the tax discrimination over equity acting like a sort of proportional tax rate on interest, increasing neutrality between financing source advantages (indeed they seem to be effective in reducing debt ratios, though reducing investments)⁷¹. However, they need coordination between countries (as they are mostly tailored for the respective countries) in order to avoid tax arbitrage opportunities and governments themselves have to be aware of the complexity of the matter, which can be dangerous for ill-advised taxpayers⁷² or can be source of loopholes for the most advised ones, leading to more complexities.

2. *Comprehensive Business Income Tax.*

Taking TCRs to the extreme, thus denying the deductibility of interest from the taxable base for the whole amount of, otherwise deductible, interest (so, *de facto*, abolishing interest deductibility), we get a so called Comprehensive Business Income Tax (from now on CBIT). Since under a CBIT all capital would be taxed, this is said to be consistent with a broad-based tax on capital withheld

G20 in order to contrast profit shifting (or debt shifting), resulting from aggressive fiscal strategies in high innovation, digitalization and globalization contexts and are allowed by law (and by phenomena like the debt bias) and by the very low flexibility of the governments with regards to the ones of the modern corporate incomes. Also, the lack of coordination between different national fiscal regimes and the presence of asymmetries are addressed as causes to be fought. This context results in erosion of the taxable base for the governments themselves, estimated between 88 and 211€ billion lost every year (4-10% of the global revenue stream related to corporate taxation) and distortions in financing decisions and assets allocation, nonetheless markets' dynamics alterations which result at SMEs' expenses. This plan consists of 15 fundamental points and aims to address these practices by supporting the OCSE - G20 governments on filling the gaps which allow firms to shift their profits in low taxed countries, without differences on where these profits are generated, thus, voiding the profit shifting strategies by giving consistency to national fiscal regimes regarding trans-national activities, reinforcing international standards, seeking for a realignment of international taxation systems and increasing the overall transparency with respect to corporate income taxation.

Servizio del Bilancio (2015).

⁷¹ International Monetary Fund (2016).

⁷² Rossi (2005).

at the firm's level. This implies the possibility to allow for a PIT exemption for interest, dividends and capital gains so that double taxation is avoided.

An early version of the CBIT (which focused on the taxation of corporate incomes after depreciation but before interest, so exempting interest payments received avoiding double taxation) has been proposed initially by the U.S. Department for Treasury in 1992⁷³ but was never implemented. Nowadays, the CBIT would address the debt bias and seek for tax neutrality by treating equally debt and equity so making the distinction between them irrelevant.

The first obvious implication of the application of the CBIT is that there would be a larger tax base, allowing for a decrease in the corporate tax rate to offset the increase in revenues from taxes (so that neutrality in revenues is maintained), having a subsequent positive effect also on debt shifting, because of the linkage of corporate tax rates and profit-shifting activities. Indeed, a lower CIT rate would make the country more attractive for multinationals intending to allocate profits and discrete investment projects⁷⁴. Under the CBIT, theoretically, full neutrality in financing decisions would be reached. Though an important consideration to be made is that a CBIT would increase the cost of capital for debt financing as an immediate consequence.

So far, we have seen that the CBIT presents some advantages, first of all the ideal "debt bias neutralization" and the possibility to lower the statutory rates, but comes also with important drawbacks, which are responsible for its non-application in any country. First and foremost, with the application of the CBIT

⁷³ This initial variant made a distinction between firms in which one category was entitled to be under the CBIT while the other was not. Most firms were so called *CBIT entities* and to them interest deductibility was fully denied. Here, in order to not incur into double taxation, interest payments coming from CBIT entities towards other CBIT entities is exempt or credited. Instead, interest payments coming from non-CBIT entities to other firms or banks is subject to tax. Interest payments coming from foreign countries will be taxed as well, with the exception of interest coming from a country in which also there is a CBIT in force.

U.S. Department of Treasury (1992).

⁷⁴ De Mooij (2012).

there would be a subsequent increase of the required rate of return of any investment, whether it is equity-financed or debt-financed, as the cost of capital for debt financing would be raised as well (as interest payment would no longer be deductible), worsening distortions to marginal investment decisions. Also, a higher cost of capital on investments financed by debt would obviously lead to a decrease in the overall investment level, coherently with what happens with TCRs. Furthermore, a CBIT does not take into account the differences in depreciation between different kinds of assets, thus creates a distortion through them, nor it is originally adjusted for inflation.

Moreover, there is an odd negative effect that would hit the financial sector, as financial firms' margin on interest lending and borrowing rates (i.e. the core profits for banks) would remain untaxed or undertaxed, transferring the full tax load to the borrowers.

A CBIT has theoretically a borderline effect when dealing with the possibility of default for firms. In this sense, while reducing or eliminating the debt bias is indeed effective in reducing the likelihood of bankruptcy, the augmented cost of capital would increase it.

The implementation of a CBIT would face rather huge obstacles regarding how to deal with pre-existing debt and how to treat shareholders' capital gains (as an exemption in this sense could be seen as a gateway to tax avoidance strategies). Also, within a relatively short period of time, an application of a CBIT is likely to increase general financial distress, and it would be seen as a "punishment" or an added burden by firms (so carrying also a political meaning).

An important issue that arises when dealing with the implementation of CBITs regards the difficulties that governments may encounter in coordinating themselves in order to dodge debt shifting dangers deriving from differences in tax rates (which would drive the firms' decisions on where to allocate taxable profits). In fact, a unanimous application of the CBIT would mitigate debt shifting strategies as there would not be preferential treatment of profits in any country. Also, regarding the financial sector, a CBIT is likely to create

international distortions between domestic banks (untaxed or undertaxed) and foreign banks (taxed).

All the drawbacks listed above have been crucial in the choice towards other methods to address debt bias issues, so, because of the unpracticality of the implementation and the massive aftereffects that could have occur in an uncoordinated international context, a full form CBIT have never been applied by any country.

Nonetheless, De Mooij (2012) proposed a variant of CBIT which consists of a partial selective application of the tax just to internal debt, promising positive effects in debt shifting addressing pursuits rather than debt bias counteractions, along with the lines dictated by TCRs. This system, for which there is some rationale, would require international coordination in order to avoid international distortions resulting from unilateral applications by one or few countries instead of all or of the majority.

3. *R-Base Cash Flow taxes and R+F Base Cash flow taxes.*

In the Meade Report ⁷⁵ there has been proposed a tax which was drastically different from the others in that instead of being based on profit in order to be computed and then applied, it was based on the net cash flows of firms. A tax of this kind is said to be a *cash flow tax*.

A tax which is included in the cash flow tax category is the so called *R-Base Cash Flow Tax* (where R stands for “real”). This type of tax establishes a denial of the deductibility for both interest payments and depreciation, substituting them with a deduction for investment expenditure and just when occurred, treating investments as current costs ⁷⁶.

The R-Base Cash Flow Tax has the immediate effect of eliminating the debt bias in favor of debt by considering debt and equity financed investments as equals, and does not affect in any way the cost of capital (so it does not affect negatively investments) nor the minimum required pre-tax rates of return on investments as it takes into account just economic rents. Also, it does not make distinctions between assets and their respective depreciation periods and is relieved from the effects of inflation, being dependent solely on the nominal cash flows for each period.

This version of cash flow tax makes a distinction between the cash flows of the firm, isolating them in “operational” and “financing” related cash flows. The further have to do with the core business of the firm itself and the latter are related to the financial side of the core business (such as borrowing activities in order to keep the core business going). Within the latter category, there is no difference in the treatment of debt and equity, thus reaching neutrality between

⁷⁵ Institute for Fiscal Studies (1978).

⁷⁶ Indeed, it is often referred to as a *100% first year allowance* or *free depreciation*. In the UK it is represented by the AIA (Annual Investment Allowance) and it works for a limited amount worth of plant and machinery related investments.

Mirrlees and Adam (2010).

sources of financing. Also, in this case, neither interest payments nor dividend payments would be tax deductible.

The R-Base Cash Flow Tax presents an important issue: it is said to be closely related to the modern versions of VATs that do not tax financial transactions, so, in this case, there would be a problem of undertaxation of financial institutions that base their core business (or, anyway, a large portion of their profits) on interest spreads.

So, a variant of the R-Base Cash Flow Tax designed to address this issue is the R+F-Base Cash Flow Tax. In this version, new borrowing is taxed as it is considered as a cash inflow and repayments of both interest and principals can be deducted from the tax base. Contrarily to the R-Base version of the cash flow tax, here we would need to distinguish between debt and equity financing with regards to the cash flows' origin, so we would lose neutrality in this sense (and we still would have interest deductibility from the tax base).

While, in theory, a cash flow tax would be simple to administer, there are several implementation issues related to how and when tax financial transactions (in the case of the R+F-Base Cash Flow Tax only, as the R-Base version does not capture financial transactions), how to deal with the greater complexity deriving from the need to keep track of every financial transaction of every firm (with even greater complexity when dealing with domestic and international financial transactions), how to manage and recover from tax losses. Also there would be difficulties to cope with pre-existing debt, as for the CBIT.

Nowadays, there have not been a country that attempted to implement a full version of the R-Base and R+F-Base Cash Flow Tax, even though Mexico adopted a version of a cash flow tax for some time and Estonia uses a variant based on the taxation of the transactions happening between shareholders and corporation (a variant of the S-Base Cash Flow Tax).

Now we are going to take an overview of the proposals put in place in these years that go in the opposite direction with respect to the ones we have examined so far.

4. Allowance for Corporate Equity.

The Allowance for Corporate Equity (from now on ACE) is one the most important reforms with regards to debt bias addressing and it is pursued (or has been) by many countries around the world at least in one of its forms.

As the name indicates, the ACE is an allowance calculated on the normal return on the equity of a firm. This approach is radically different from the previous ones we have seen so far, as it suggests a further deduction from the taxable base rather than just interest deductibility.

The ACE has been proposed for the first time by the IFS Capital Taxes Group in 1991 in the United Kingdom supporting the principle of a tax aid towards the firms which use equity funds in order to keep the business going in the form of a deduction for a notional cost of equity finance.

So, a notional return to shareholders' equity is allowed for a deduction and it is calculated on the end of last year's equity stock, theoretically, at a risk-free rate of return⁷⁷. In this way, the tax burden is lightened only for the excessive part of profits related to the investors' required return, making ACE neutral with regards to source of financing (even though there some implications about personal taxation have to be taken into consideration, and we will explore this aspect further in this section). Another implication is related to the fact that, by having a deduction allowed for all sources of financing, we would have a CIT that resembles more a tax on economic rents. In this way, in principle,

⁷⁷ As the benefit deriving from the deduction for equity can be calculated certainly, the notional return that shall be applied corresponds to a risk-free nominal interest rate. This is the case for, e.g., the interest rates related to government bonds.

investment decisions would not be distorted with regards to their scale since the effective marginal tax rate would be equal to zero.

In general terms, the ACE is computed on the closing yearly stocks of a firm which are composed the sum of the opening stocks, the equity issued and the retained profits of the year (which correspond to taxable income, minus the ACE allowance, taxes paid and dividends distributed to shareholders), minus the potential repurchase of equity. Then a notional rate of interest is applied, resulting in the actual allowance. As stated above, the notional rate applied to compute the ACE allowance is the nominal risk-free interest rate as a higher interest rate would make the ACE distort financing and investment decisions of the company⁷⁸.

A special type of ACE, named the Notional Interest Deduction (NID from now on), also known as *soft ACE*, works on the same wavelength of the *hard ACE*, but the allowance to be granted is not computed on the whole equity anymore. Instead, here just the increment of the equity throughout the year is taken into consideration (in Italy, this is called *Aiuto alla Crescita Economica* – Aid to Economic Growth, coherently with this mechanism). In order to give an idea of the functioning of the NID allowance, let us have a firm that augmented its equity amount during the year from 1000 to 1200. The allowance would be calculated with a notional interest rate set by law⁷⁹, for example 4,5%. Then, the allowance would be equal to 9, that is the rate set at 4,5% times the increment of equity, so 200⁸⁰.

⁷⁸ Bonds and Devereux (2003).

⁷⁹ In Italy it has been equal to 4,75% for FY 2016, 1,6% for FY 2017 and 1,5% for FY 2018. The steep decrement is due to the excessive perceived “generosity” of the allowance. Also there have been posed some further conditions with respect to certain types of investment in order to get the benefits of the allowance.

Branzoli and Caiumi (2018).

⁸⁰ Another variant of the ACE/NID is represented by the Brazilian type of allowance. The country introduced a deduction of dividends granted only to those firms which paid them out to shareholders (so we would have not a deduction within the case of retained profits).

The ACE allowance (and the NID version too) seems to have very appealing bright sides to those countries which decide to implement it. First of all, thanks to the dual deduction of both interest and the normal rate of return on equity, taxes are now indifferent on the source of financing exploited to take on an investment. In this way, ACE reaches neutrality between debt and equity financing and is neutral regarding marginal investment decisions with respect to the scale of investment. Also, the ACE introduces a neutrality perk with respect to decisions on which asset to invest, which can be deviated by the differences in depreciation throughout the years that may arise between different kinds of assets. In this sense, the “speeds” of depreciation of different assets can be offset by a different allowance, so if an asset’s depreciation schedule is lower than another one’s (resulting in a higher taxable income at the end of the year), its related allowance would be higher and vice versa.

Of course, by seeking to neutralize debt bias, the ACE is proven to be effective in reducing corporate debt ratios and, then, probability of default. For example, Branzoli and Caiumi (2018) estimated a reduction in the likelihood of bankruptcy of circa one tenth and reported a decrease in the total cost of debt (thus having firms getting easier and longer access to credit) on average by 1.43% in the early years of the implementation of a NID type of ACE in Italy. Moreover, the neutralization of the incentive to use too much debt has the side effect of incentivizing innovative firms to take on innovative and risky projects, as equity is better suited for these kind of investment ⁸¹.

⁸¹ Magri (2009).

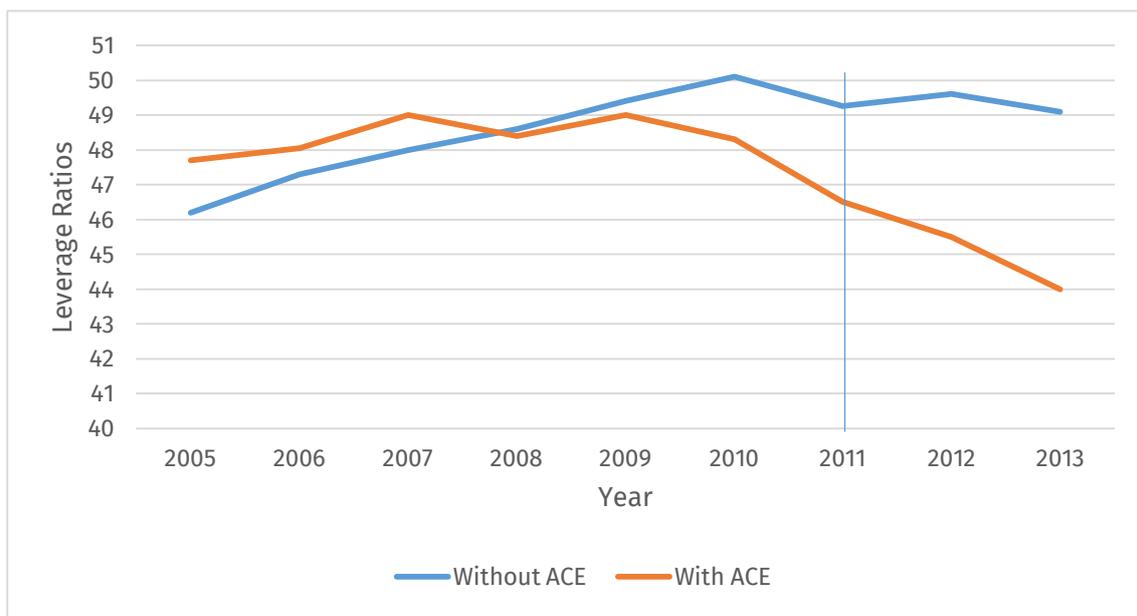


Figure 10: Time-series of firms' leverage ratios before and after ACE implementation in Italy (2011).

from Branzoli, Nicola, and Caiumi, Antonella. (2018), "How effective is an incremental ACE in addressing the debt bias? Evidence from corporate tax returns." *Evidence from corporate tax returns* (January 2, 2018).

To be noted, the ACE can be tweaked in order to be unaffected by inflation, also without any kind of indexation as it is calculated by applying a nominal interest rate to an unindexed equity base⁸².

Another important aspect, from a social point of view, is that the ACE would likely positively affect salaries and wages, so bringing economic benefits ultimately to employees (by having their firms being more attractive with respect to capital inflows, improving productivity and then wages – broadly speaking).

Last, but not least, the ACE allowance has been proven to be relatively easy to implement in a tax system, as all the information needed in order to compute the allowance (dividends, new equity etc.) is already available within the firms' accounts (and the notional rate, as stated above, can be simply set equal to the government bond rate). Indeed, several countries have tried to implement the

⁸² Klemm (2007).

ACE or have still it in force in their tax systems without major concerns during the implementation process⁸³.

Nevertheless, the ACE allowance puts on the table many important concerns that have been the reason for several countries to not implement it in their respective tax systems.

The main concern related to ACE is the first consequence of the introduction of an additional allowance to the tax system, that is the narrowing of the tax base⁸⁴. This naturally evolves in higher tax rates when seeking for revenue neutrality, but, in practice, this is not always a necessity for governments (for example, the Belgian ACE introduction left the CIT rate unvaried). There exist some ways to reduce the revenue loss created by the ACE. For instance, the ACE allowance could be sectoral or could be related only to equity increases (such as the NID version of the allowance, that has been proven to be less detrimental in this sense⁸⁵). Also, the possibility to combine the ACE allowance to other, antithetic features like limitations to interest deductibility can be an easy way to overcome the expected reduction in CIT revenues.

Moreover, as for the case of all the other possible remedies to debt bias, a serious threat to the effectiveness of the allowance is represented by the lack of coordination between countries. Indeed, the existence of an ACE allowance in just some countries instead of all (or the majority) creates important opportunities for multinational firms to do tax planning activities and exploit loopholes, for example acting as an incentive to multinationals to create loans

⁸³ International Monetary Fund (2016).

⁸⁴ The International Monetary Fund (2016) presents a simulation regarding the introduction of an ACE allowance calculated on all equity at the rate of a 10-year government bond, finding that the estimated revenue loss is between 5% and 12%, with differences from a sector to another. Though, they reported that these results could be significantly lower in reality due to the lower level of deductible interest in case of equity expansion. De Mooij (2012), as well, reports an ACE total fiscal cost of about 15% of the CIT revenues, assuming no changes in the rate.

⁸⁵ International Monetary Fund (2016).

between affiliates (financed by equity) in order to get interest deductions in countries without an ACE allowance in their respective tax system.

In any case, ACE seems to have more pros than cons (given that the literature reports the negative sides of the reform to be resolvable, contained or even irrelevant ⁸⁶). Even though, logically, it may seem the best choice to adopt in order to contrast debt bias and other distortions, the ACE allowance usually meets political and socio-economical obstacles, such as the general misperception that the allowance encounters. In this sense, the ACE may be less captivating than reducing the CIT rate, which would be a more favorable option to already profitable and established firms (despite the fact that the further would have a minor impact on decreased CIT revenues).

An appealing solution may be embodied by the application of the allowance just to certain sectors or industries, as stated above. For instance, an ACE allowance applied only to the financial sector would be positively affecting the stability of the economic systems, as it represents the one of the major concerns when it comes to deal with financial distortions (and this is the case where it seems to make sense not to seek for tax neutrality at all costs). Also, the loss in revenues would be more compartmentalized ⁸⁷.

Notwithstanding all the positive features that the ACE allowance carries with it, we have, nowadays, few examples of countries which have implemented it (and many have now abandoned it as well) with some success, represented by generally easy application and effective reduction in debt ratios. In particular, Croatia, Austria and Italy have experienced, then terminated, a certain type of ACE. Today, Belgium, Brazil and Latvia have their own variants of ACE.

⁸⁶ International Monetary Fund (2016).

⁸⁷ Other than administrative and complexity aspects, as well as the creation of avoidance opportunities that would emerge applying the allowance just to the financial sector (which is strictly regulated, and this can be a double-edged sword) another drawback here would be that a non-neutral allowance could be perceived as an unfair gift to some instead of to all.

5. Allowance for Corporate Capital.

Though with the ACE we should have no longer distortions in financing decisions at the corporate level (between debt and equity), there are still different tax policies for debt and equity. So there exist a (less popular) variant of the ACE which seeks for more neutrality by extending the allowance for corporate debt (substituting the current interest deductibility), *de facto* permitting the deductibility of a notional return (i.e. the nominal cost of finance) for all kinds of capital at the corporate level. In this sense, the overall deduction is equal to a presumed return on equity and interest in the nominal amount ⁸⁸. This would imply the same economic propositions as the ACE system with the elimination of the motives to the different tax treatments between debt and equity, so reducing complexity.

The Allowance for Corporate Capital can be seen as the blend of both ACE and CBIT, due to the fact that it permits a limited deduction on corporate equity and interest, in order to be revenue-neutral ⁸⁹.

An appropriate design of an ACC reform would likely bring to the table all the good properties that ACE and CBIT have to offer while mitigating their negative sides (which would be present in full form whilst adopting the pure version of these systems). De Mooij and Devereux (2009, 2011) analyze the response of corporate tax bases while having neutrality with respect to source of financing in the context of ACE and CBIT. Also the combination of the two systems is taken into consideration, presenting positive results with respect to neutrality keeping and welfare improvement ⁹⁰.

⁸⁸ Spengel (2016).

⁸⁹ Fatica, Hemmelgarn and Nicodème (2013).

⁹⁰ De Mooij and Devereux (2008, 2011).

6. Cost of Capital Allowance.

Another minor possibility that is not often taken into consideration by countries when dealing with debt bias is the Cost of Capital Allowance (known as COCA). The COCA is comparable to many aspects to the ACC, in that they both allows for a deduction of interest and equity at the corporate level (the COCA is said to introducing a uniform deduction on both equity and debt on behalf of the single interest deduction), so reaching neutrality among sources of financing. The difference here lies at the shareholder level, which, under a COCA, is subject to taxation not anymore of dividends or interest income, but on their investments at the same rate of the one applied at the corporate level. This would result in an indifferent taxation with regards to capital gains and dividends (leading to a lower EATR for financing sources, as dividends received are no longer taxed ⁹¹).

As for the other policy options analyzed so far, if a COCA (as well as an ACC) is imposed heterogeneously between countries, this is likely to lead to the creation of arbitrage opportunities for firms, which would be encouraged (or discouraged) to locate their investments in higher or lower taxed countries ⁹².

7. Others.

Besides the main proposals and remedies to debt bias overviewed so far, there are plenty of minor tweakable strategies that can be adopted or integrated in the actual reforms. In this part, we will briefly scroll through them.

Double taxation of equity financing is one of the main concerns regarding debt bias, because can be easily overlooked while seeking for neutrality at the

⁹¹ Spengel, et al. (2016).

⁹² Regarding this, Knoll (2009) states that these side effect of a unilateral application of the COCA (in his work, in the context of U.S. industries) would induce some competitiveness dampeners because of the mismatch of the taxation levels between countries (to which firms would locate their investments). The COCA would be capable of remove one of these negative effects at once, not both at the same time and for good.

corporate level and not considering the differences that can be found at the shareholder level (so taxation of dividends, share acquisitions and capital gains).

Moving towards this direction, we find proposals that attempt to reduce or eliminate the possibility of double taxation in order to address debt bias at the shareholder level. For instance, exempting dividends from the personal tax base, we would not reach tax neutrality, as different tax rates between firms' and shareholders' would lead the shareholders to be inclined to go for debt or equity, depending on the level of their marginal tax rates (high marginal rates lead to equity preference; low marginal rates lead to debt preference). Anyway, exempting dividends from taxations would address debt bias.

Another system is represented by the imputation of dividends, making them taxed at the shareholder level (instead of being plain exempt), but the latter receives back as tax credit an amount equals to the gross-up applied to their taxable income, again grossed up by the taxes paid by the firms because of the distribution of dividends. This method makes a step forward towards neutrality between debt and equity as it leaves the ultimate choice of financing to the shareholders, placing debt and equity in the same plane as for the subject who shall make the application. Though, this method has been tried and promptly dismantled by some countries as it brought several complexity and issues on the table⁹³.

Last, but not certainly least, lowering the statutory tax corporate tax rates makes sense to a country willing to address excessive leverage (so debt bias, in some way). Even though, in the past, cuts in the corporate tax rates were not meant to be a solution to debt bias, instead they were planned to be pluses in the tax competition between governments, the final results were significant not in addressing debt bias in a direct way, but have helped in the search for neutrality of choice for investors, by reducing the value of the tax shield⁹⁴. As De Mooij,

⁹³ Shaviro (2011).

⁹⁴ See Shaviro (2009) and Fatica, Hemmelgarn and Nicodème (2013).

Keen and Orihara (2013) point out, a reduction in the corporate tax rates plus the application of an ACE on the financial sector would likely bring more welfare gains than the other solutions (with all the pros and the cons to be taken into consideration, such as the creation of arbitrage opportunities between countries and industries and political issues).

4.4 The status quo in the EU28 area

In this section an overview of the *status quo* of the EU area countries regarding the tax policy adopted with respect to leverage, debt bias and debt shifting is given. In order to transpose the EU directive 2016/1164 (also known as ATAD1, Anti-Tax Avoidance Directive, namely a directive which objective is to *lay down rules against tax avoidance practices that directly affect the functioning of the internal market* and which is preeminently oriented towards the application of TCRs and limitations on interest deduction rather than using further allowances) the governments currently present the situation displayed in the following table:

Country	Limits on interest deduction (other than TCRs)	Application of TCRs	Application of ACE
Austria – AT	The financing costs which a firm bears to acquire participations within a group cannot be deducted. Also, interest paid to affiliates are not deductible if it is already taxed to the receiving entity at a rate lower than 10%.	-	-
Belgium – BE	Interest cannot be deducted if related to advances, if considered overstated, if TCRs are applied, if the firms does not comply with the <i>permanency condition</i> with regards to the exemption of participations.	Yes, as part of the CIT law. Test is ratio → 5:1=D/E (debt considered is both internal and external) TC depends on direct shareholding where the threshold is set at 50,01%	The notional rate is set at 0.726% of income for year 2019 (1.226% for SMEs). NID type of allowance.
Bulgaria – BG	Interest is deductible up to 30% of EBITDA and can be deducted only in the period of incurrence and only if the borrowing costs are less than 3.000.000€.	Yes, as part of the CIT law. Test is ratio → 3:1=Liabilities/E (debt considered is both internal and external) TC does not depend on shareholding.	-
Cyprus – CY	Interest deduction is denied for up to 7 years if debt financing is targeted at	-	-

	the purchase of non-operative assets.		
Czech Republic - CZ	Interest on loans for participation acquisition and interest on profit participation loans are not deductible.	<p>Yes, as part of the CIT law.</p> <p>Test is ratio → 1:4=loans to related parties:equity (so debt considered is just internal)</p> <p>TC depends on indirect shareholding and the threshold is set at 25%.</p>	-
Germany - DE	Interest is deductible up to 30% of the EBITDA. The limitation is no longer valid if the total amount of interest expenses does not exceed 3.000.000€, if the firm is not part of a group of companies (or, if it is and the ratio of E/Total Assets is equal or higher than the group. These exceptions are valid just for those firms paid less than 10% of the net amount of interest expenses to the major shareholders.	<p>Yes, as part of the CIT law.</p> <p>TC depends on direct shareholding and the threshold is set at 50%.</p>	-
Denmark - DK	Interest expenses may be deducted on a yearly basis up to 80% of EBIT (the exceeding part can be deducted in the succeeding income years). If the total amount of interest expenses does not exceed 21.300.000DKK then they are always deductible. Also, a TC test and an asset test pass are required to have full deduction of net financing expenses.	<p>Yes, as part of the CIT law.</p> <p>Test are arm's length and ratio →</p> <p>Ratio is 4:1=Total debt:Total equity (debt considered is only internal)</p> <p>TC depends on indirect shareholding and the threshold is set at 50%.</p>	-
Estonia - EE	Borrowing costs higher than 3.000.000€ or 30% EBITDA are deductible, but not in the case of a standalone entity, financial undertakings and loans used to fund a long-term public infrastructure, whereas the project contractor, interest expenses, assets and profits are all located in the EU area.	-	-

Greece – EL	Interest expenses are not deductible if related to loans undertaken by a firm from third parties, up to the amount that would arise with an interest rate equal to the one related to loans accounts provided to non-financial enterprises. This is not valid for inter-banks loans, bonds and inter-company loans issued by SAs.	Yes, as part of the CIT law. Test is ratio →30:100=Excess of interest expenses against income from interest:EBITDA (debt considered is both internal and external) TC does not depend on shareholding.	-
Finland – FI	Interest deductibility is limited to 25% of EBITD. This is not valid if the net interest expenditure is lower than 500.000€ and the net interest expense of external net interest is lower than 3.000.000€. Interest expenses exceeding interest income is fully deductible.	-	-
France – FR	The greater amount between 3.000.000€ and 30% of EBITDA. (Before 2019 : 75% of net interest expenses, if the latter were higher than 3.000.000€)	Yes, as an explicit TC law. Test is arm's length and ratio → Ratio is 150:100=average debts to related parties (debt considered is only internal) TC depends on indirect shareholding and the threshold is set at 50%	-
Hungary – HU	Interest expenses are not deductible for the amount exceeding 30% EBITDA or 939.810.000 forints (the greater between the two). Financial institutions, investment firms, alternative investment fund managers, fund managers of undertakings for collective investment in transferable securities, insurance and reinsurance companies are exempted from the rule.	Yes, as part of the CIT law.	-
Ireland – IE	Interest must be wholly and exclusively for the purpose of the trade.	-	-

Italy - IT	Interest expenses are deductible up to the value of interest received. The exceeding amount is deductible up to 30% EBITDA. Any further exceeding amount can be carried forward.	-	-
Lithuania - LT	Interest expenses are deductible up to 30% EBITDA or 3.000.000€ (the greater between the two). An arm's length test is required for interest expenses related to affiliates (the fair market rate represents the upper limit of deductibility of interest). It is specified by the CIT law that interest expenses related to non-taxable bases are not subject to deduction, nor are interest expenses towards countries registered in a special blacklist (unless there are important proven economic activities going on between the countries).	Yes, as part of the CIT law. Test is ratio →4:1=D:E (debt considered is both internal and external) TC depends on direct shareholding and the threshold is set at 50%.	-
Luxembourg - LU	Interest expenses are deductible up to 30% EBITDA or 3.000.000€ (the greater between the two).	-	-
Latvia - LV	-	Yes, as part of the CIT law. Test is ratio →1:4=D:E (debt considered is both internal and external) TC does not depend on shareholding.	-
Malta - MT	-	-	-
Netherlands - NL	Interest expenses are deductible up to 30% EBITDA. Interest expenses related to non-functional loans paid to an affiliate are not deductible.	-	-
Poland - PL	-	Yes, as part of the CIT law. Tests are ratio and arm's length. Ratio is 1:1=interest income:cost, depreciation, debt financing	-

		costs (debt considered is just internal) TC does not depend on shareholding.	
Portugal – PT	Interest expenses are deductible up to 30% EBIT or 1.000.000€	-	The notional rate is set at 7%.
Sweden – SE	Interest expenses are deductible up to 30% EBITDA or 5.000.000 SEK (the greater between the two). The monetary threshold of 5.000.000 SEK can be exploited just once by affiliates.	-	-
Slovenia – SI	-	Yes, as part of the CIT law. Test is ratio → 1:4=the amount of the shareholder or partner in the capital of the taxpayer:capital of the taxpayer (debt considered is both internal and external) TC depends on indirect shareholding and the threshold is set at 25%.	-
Slovak Republic – SK	Interest expenses are deductible up to 25% EBITDA.	Yes, as part of the CIT law. Test is ratio → 1:4=interests:EBITDA (debt considered is just internal) TC depends on direct shareholding and the threshold is set at 25%.	-
Spain – ES	Interest expenses are deductible up to 30% of the operating profit, with an upper limit of 1.000.000€	-	-
Romania – RO	Only for microenterprises, interest expenses are deductible up to 200.000€. The exceeding part is deductible during the FY of accountancy up to 10% from a computation basis.	-	-

United Kingdom - UK	Interest expenses are deductible up to 30% EBITDA. Also, an alternative group ratio computation is available if, in this way, the group would reach a higher level of deduction.	Yes, as part of the CIT law. Test is arm's length. TC does not depend on shareholding.	-
Croatia - HR	Interest expenses are not deductible when there exists a loan granted by a shareholder and said shareholder holds 25% or more of the shares/voting rights of the taxpayer. Moreover, the loan is subject to the ratio test provided by TCRs, setting the exceeding part of the deduction to be non-deductible.	Yes, as part of the CIT law. Test is ratio → 4:1=loan balance:equity (debt considered is both internal and external) TC depends on direct shareholding and the threshold is set at 25%.	-

Table 9: Current tax policies in Europe addressing debt bias.

Source: data from the European Commission Database – ec.europe.eu

As one can tell from the table above, the European area is mostly inclined towards denying further deductions instead of applying an allowance, despite the fact that most literature leans towards the latter as the most favorable option to address debt bias. In fact, as to follow the ATAD1 most countries adopt their own variant of TCR and interest deduction limitations (making them less attractive compared to countries which do not adopt them).

Anyway, the situation remains in favor of debt over equity, as most tax systems still allow the deduction of the whole amount of interest while they do not offset this disproportion with an equal deduction for equity financing ⁹⁵.

⁹⁵ Whilst we did not take into account personal taxation deeply, it is worth noting that even by this side of taxation, debt is always preferred.

Spengel (2016).

CHAPTER 5 – Concluding remarks

In this thesis work we started our analysis from the fundamental concepts of capital structure, by defining the ways in which firms can meet its financial needs and narrowing the circle to debt and equity (and their various forms).

Then, we explored the theory behind how a firm's capital structure is built and we encountered different reasons because of which a firm would be inclined to go for debt instead of equity and vice versa. In this sense, by introducing the debt bias in the equation we came through a phenomenon bigger than it seems at first sight, in terms of economic and welfare size⁹⁶. The possibility to deduct interest payments from the taxable base, not combined with a correspondent measure with regards to equity financing, is a real issue all over the world's tax systems as it introduces, otherwise inexistent, distortions at the corporate level regarding financing decisions⁹⁷, which have long been acknowledged by the economic community. We have seen that the distinction between debt and equity from a tax point of view is supported by few unclear arguments, and many having just an historical background that seem illogical to support nowadays. So, even if the systematical differential tax treatment of debt and equity financing is hardly defensible, in practice we witness actual strategies and tax planning set up by taking into account the differential tax treatment, its perks, its disadvantages and its loopholes⁹⁸, thus encouraging practices like debt shifting (or international tax arbitrage) and damaging SMEs and innovative firms⁹⁹. Thus, the existence of the debt bias leads to important welfare implications which, ultimately, lead to a greater probability of default, risk of

⁹⁶ See De Mooij (2011)

⁹⁷ The preference towards debt would be even greater taking into account personal taxation.

⁹⁸ Due, especially, to the differences in definition of equity and interest in the different countries and the complexity and diversity of the respective sets of laws, added to the increased innovation in financial instruments and firms' internationalization leading to more problematic tax administration issues.

⁹⁹ See Devereux and Gerritsen (2010).

crises and financial distresses for all kinds of firm and industry (e.g. because of the spillover effects induced by excessive leverage ratios in financial firms).

Throughout this work we have also overviewed the reasons which brought the recent Global Financial Crisis to existence, focusing on the role of taxation in triggering, deepening and prolonging it. While taxation has been recognized as not the primary cause in generating the crisis, its role has been defined as enough important to bring the international tax legislators' attention to it, getting several reforms to see light. Indeed, many tax systems' provisions, such as the favorable treatment with respect to debt over equity, have been proven to be pointing in the wrong direction (or, at least, they were not strong enough) as far as neutrality and excessive leverage concern.

At the moment, the road to neutrality is still an open case. The differences in treatment between debt and equity could be, at least in principle, neutralized. So far, there are available several policy options that could address debt bias effectively and at the corporate level to a great extent, each one with its own advantages, drawbacks and implications regarding subsequent investment decisions and financial behaviors of firms and countries. We took a broad gander to several policy proposals that have been made, some adopted then maintained, some adopted then rejected and others which have never been implemented. The main reforms took two diametrical opposite directions as far as interest payments' treatment concerns. First, interest payments could be deducted from the taxable base no longer or in a scaled fashion, thanks to the implementation of TCRs (which many countries currently have in their tax systems) or a CBIT. Thus, we would have increased or full neutrality at the corporate level, associated with a broader tax base (allowing a reduction in corporate tax rates). Anyway, in this case, the drawbacks would be mainly related to the increment of the general cost of financing, followed by the decrease of attractiveness of firms and countries in terms of global competition, especially when seeking for a revenue neutral tax. Then we would have administrative concerns (e.g. administrative difficulties with respect to the treatment of existing debt) and double-taxation problems. Also, especially for TCRs, if the application is related just to internal debt, debt bias would not be

addressed as the rule would affect just profit shifting. In the opposite side of the line of thought we have reforms that imply the introduction of further allowances other than the interest payments deduction from the taxable base. Here is the case for ACE, ACC and COCA. These systems are recognized by the literature as the most promising in terms of positive effects, whilst they are far from being implemented on a large scale. In this sense, we would reach neutrality between sources of financing and a reduction of cost of capital (if the notional rates and the market interest rates are the same), followed by a potential increase in the statutory tax rate in order to reach revenue neutrality. These last reforms do not imply difficulties in their implementation. In particular, the ACE have been adopted by some countries without any implementation issue. Also, the adoption of an ACE, contrarily to CBIT or TCRs, promotes investment, tax attractiveness and competitiveness of the countries adopting it, even seeking for revenue neutrality¹⁰⁰.

Amongst the economic and financial communities there exist reasons to think that neutrality at the source is not always the right path to take. Neutrality is recommended in most of the areas affected by debt bias, but there are cases in which going beyond neutrality can be the right choice. This is the case of the proposal of an ACE system tailored to financial firms, due to the greater externalities that would occur in case of failures. Also, it has been stated that taxation should not always seek for neutrality, in fact, penalizing debt over equity would be a wise move in order to fight excessive leverage ratios. On the other way around, taxation could be designed to encourage capitalization and innovative investments (e.g. a sector specific ACE).

At this point, we see that the ACE system (or, at least, an allowance system rather than an interest deduction denial system) is indicated as the most attractive in terms of gains, as the potential drawback are irrelevant or can be compensated by countermeasures (i.e. combining an ACE system with TCRs *et similia*, in order to be neutral at the corporate level, then taxing specific sectors where externalities and spillover effects are greater) and an appropriate tweaking in

¹⁰⁰ Also, it has been stated that the ultimate beneficiaries of the ACE system are the employees.

the shareholder or personal side of taxation ¹⁰¹. In all cases, the lack of coordination between countries is pointed out as an important possible cause of generation of loopholes, international arbitrage opportunities and administrative concerns and difficulties and, so far, these reforms have been implemented by a fairly minor amount of countries.

Nowadays, the argument is still not solved yet. Though, remedies and alternatives are a constant presence in the national and international agendas with regards to tax policies and debt bias, as the effects on macroeconomic stability have been recognized as a real issue, especially after the last Global Financial Crisis.

¹⁰¹ In this sense, also the ACC and COCA would be feasible options, as the ACC would share the neutrality properties of the ACE and the COCA would overcome debt bias but at the cost of problems at the shareholder level.

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