



THE DEBT-EQUITY TAX BIAS: CONSEQUENCES AND SOLUTIONS

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Abstract: The tax deductibility of interest payments in most corporate income tax systems coupled with no such measure for equity financing creates economic distortions and exacerbates leverage. This paper discusses the consequences of this debt bias and the possible remedies.

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1 INTRODUCTION.

The tax deductibility of interest payments under most corporate income tax systems while with no such measure is foreseen for equity financing can create a distortion in the financing decision of companies. This tax-induced bias has led to a recommendation for fixing it in the context of the European Semester (European Commission, 2012). The bias results in at least two types of economic distortions. First, the deductibility of interest expenses exacerbates opportunities to shift and decrease reported profit via debt-shifting or the use of hybrid instruments¹. Second, it may lead to too-high leverage in companies, increasing systemic risk.

This paper is organized as follows. The corporate tax bias interacts with several other non-tax determinants of corporate structure and this is reviewed in section (2). Next, section (3) discusses possible rationales (or their absence) for discriminating between sources of financing. Section (4) presents evidence on the impact of the debt-bias on leverage and profit shifting and section (5) discusses the welfare losses incurred. Section (6) reviews policy options to correct this bias – CBIT, ACE, ACC - and stresses some possible consequences. Conclusions follow. Several recent works have been carried out on this topic and we partially draw on them. In particular, de Mooij (2011a, 2011b) and Graham (2011) offer a comprehensive discussion of the issue, while Shaviro (2011) studies the bias in the context of the financial crisis.

2 THE DETERMINANTS OF CORPORATE CAPITAL STRUCTURE.

The standard Modigliani-Miller (1958) theorem states that, if specific conditions hold², a firm is indifferent between various sources of financing (either issuing stocks or issuing debt).³

¹ The differential treatment of debt and equity can also lead to profit shifting activities via intra-firm loans. See Fuest and Hemmelgarn (2005) for a theoretical model where this type of profit shifting is used.

² E.g. the absence of agency and bankruptcy costs, of asymmetric information, of taxes, market efficiency, etc.





The value of an unleveraged firm is equal to the value of a leveraged firm: $V_L = V_U$. In reality firms deviate from this rule. A number of explanations for this have been identified, among which the existence of agency and bankruptcy costs, of asymmetric information, and of limited market efficiency, but also the role of taxation.

In most corporate tax systems, debt-financing is favored via the tax-deductibility of interest payments. When this is taken into account, the value of the leveraged firm is equal to the value of the unleveraged firm, augmented by the *tax shield value of debt*. This tax shield equals the amount of debt times the corporate tax rate: $V_L = V_U + tD$. Hence, a company could in theory maximize its value by being financed 100% via debt.

There are however other non-tax reasons why debt- and equity-financing may be distorted. First, highly leveraged firms are more vulnerable and face *bankruptcy costs* (sometimes also called costs of financial distress) that increase with the level of debt. In such a case, the optimal debt level is set to the point where the marginal benefit of an additional unit of debt (here the tax rate t) equals its marginal cost (here the marginal bankruptcy cost).

Second, so-called *agency costs* may lead to an increased use of debt. Agency costs reflect conflicts of interest between shareholders and respectively two other categories of stakeholders: managers and bondholders. In the first case, asymmetry of information on the actual situation of the firm gives incentives to shareholders to promote debt-financing as this restricts the Free Cash Flow available in the company.⁴ This is because the Free Cash Flow usually derives from rent-generating activities and potentially provides managers with funds to invest in wasteful

³ In addition, its dividend policy shall not matter.

⁴ Free cash flow is cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital (Jensen, 1986).





investments. It also creates incentives for managers to make the firm grow beyond its optimal size, notably because their remuneration may be linked to the size of sales. Managers could promise to give back this Free Cash Flow to shareholders via higher future dividends but the dividend policy can easily be reversed. Therefore, by substituting debt for equity, managers are bound to pay out the cash flows because bondholders (who can at the same time also be shareholders) have the right to take the firm to court. This conflict of interest can therefore be a determinant of capital structure of companies (Jensen, 1986). In the second case, shareholders may have an incentive to convince managers to finance by debt because they can then shift part of the bankruptcy cost to bondholders.

Third, debt issuance and dividend policy have *signaling effects*. The direction of this effect is nevertheless disputed both theoretically and empirically. On the one hand, issuing debt can indicate that the firm is confident about its repayment capacity (Ross, 1977). On the other hand, it can indicate that the firm lacks internal resources and is dependent to debt markets, which can lead to an adverse selection problem (i.e. a lemons market for debt where only bad debtors remain). In that case, there would be too little borrowing in general but also an asymmetry with too little borrowing from good firms and too much from bad firms. Stiglitz and Weiss (1981) provide such a model of credit rationing based on adverse selection. This adverse selection problem led to the pecking order theory of Myers and Majluf (1984) and Myers (1984) that firms will favor internal equity over debt and debt over external equity (because given that new shares shall not be issued if a firm is undervalued, the issuance of new shares is interpreted as a sign that the company is overvalued). De Mooij (2011a) points however to two potential problems. First, the rationing could equally affect equity markets, as shown by de Meza and Webb (1987). Second, the tax distortion favors mostly those firms that have access to credit and





are highly leveraged, leading to distortions across types of companies. Graham and Leary (2011) show indeed that firms vary widely in their use of debt. Taking data from Compustat annual files from 1974 through 2009, they show that highly-leveraged companies (quintiles 4 and 5 compared to quintiles 1 and 2) are “*significantly larger, older, have more tangible assets, lower market-to-book ratios, less volatile earnings, higher marginal tax rates and less R&D intensive*”. This is particularly true for firms with long maturity of debt. The relationship is however non-linear since very highly-leveraged firms (quintile 5) are smaller, younger, have higher market-to-book ratios and more R&D-intensive than those that are highly-leverage (quintile 4).

3 IS THERE A RATIONALE FOR DISCRIMINATING?

Some of the aspects reviewed above may offer theoretical economic rationales for using the tax system to discriminate between debt and equity. As pointed by de Mooij (2011b), however, the withering borderline between debt and equity instruments alters the relevance of these theories. No strong externality would call for a bias in favor of debt and the recent financial crisis stressed rather the opposite. There is empirical evidence that the leverage of corporations is influenced by taxes and that although the debt-equity distortions did not create in itself the recent financial crisis, they may have aggravated it.⁵ The debt bias could lead to liquidity constraints, especially in times when banks tend to restrict their credit supply. A well-designed tax base that reduces the leverage distortion could make financial as well as non-financial companies less vulnerable to a short-term reduction in credit available on the capital market. The debt-bias may also have led to the issuing of hybrid instruments that blend characteristics of debt and equity, such as convertible bonds. These instruments qualify as debt and therefore allow for the

⁵ Shaviro, 2011; Shackelford, Shaviro and Slemrod, 2011; IMF, 2010; Hemmelgarn and Nicodeme, 2009





deduction of interest paid but have equity-like characteristics. Hence, they tend to reduce the transparency and accountability of corporate financing policies. However, there are so far no empirical studies on the magnitude of these effects. Correcting the debt bias may well lead to beneficial effects. It is peculiar that, in the present context of seeking corrective taxes, current corporate tax systems contain tax distortions that do the opposite and provide incentives to take up too much debt.

In the majority of tax systems, the more so with the use of sophisticated instruments, the distinction between debt and equity is subject to the application of several criteria such as 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), etc. Devereux and Gerritsen (2010) show that there are no objective legal reasons to distinguish between both sources of financing. On the contrary, the rise in administrative complexity would rather call for a similar tax treatment. The distinction could possibly originate in an artificial distinction made by the traditional view that dividends were merely seen as the remuneration of capital while interest payments constitute a business cost.

As reported by EEAG (2011, chapter 5), the issue of high leverage in the banking sector has been subject to intensive research. Some of the arguments to justify this high debt point to the role of debt to discipline managers (this is the agency cost discussed here above), the increased funding costs because equity is more risky, and a possible credit rationing. Admati et al. (2010) and Hellwig (2010) find that these fears are unlikely to materialize and that in such case they would internalize the externalities imposed on taxpayers and creditors. In addition, the pronounced use of sophisticated products by financial institutions allows them to take advantage of differences of treatment between taxation and regulatory purposes. This is the case for





example of contingent convertible capital (also known as ‘CoCo’ or “contingent core Tier-1 capital”), which is a form of debt (and treated as such for tax purposes) that will convert into shares once the financial institutions capital requirement falls under a reference level. Some countries may count them as capital, leading to a double-benefit for the financial institution and an incentive to use such instruments.

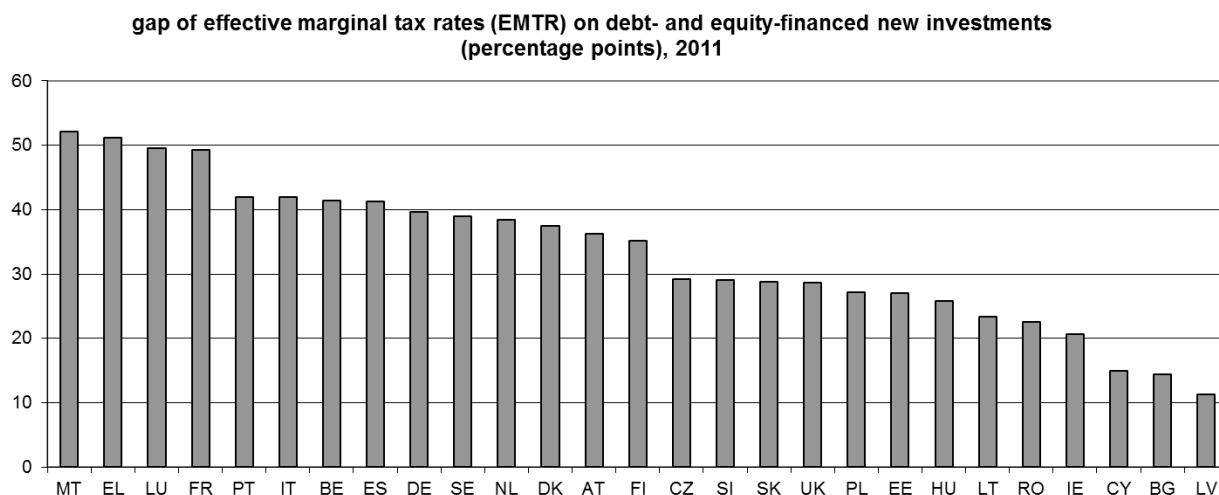
One other possible rationale for favoring debt over equity via corporate taxation could lie in the joint analysis of taxation at shareholder and bondholder levels. Personal income taxes indeed discriminate as interest received is often taxed in full at personal income tax rates while capital gains and dividends are often taxed at lower separate final withholding tax rates (Gordon, 2011).⁶ According to Graham (2011), the empirical evidence implies that the PIT disadvantage is between 1/3 and 1/2 of the CIT advantage, so that overall the tax advantage of debt still remains.

4 LEVERAGE AND DEBT-SHIFTING ACTIVITIES.

4.1. Leverage.

Because of the tax deductibility, most tax systems in Europe de facto provide a subsidy to financing via debt. In other words, debt-financed investment bears a negative effective marginal tax rate (see graph hereunder). This implies that marginal investment projects that would not be profitable in the absence of taxation become profitable thanks to the subsidy. All in all, the distortion in allocation efficiency might be sizeable.

⁶ Nevertheless, in many Member States, interest income from banks from special savings or investment accounts is exempt. Some countries may also tax incoming interest payments under a (final) withholding tax at a rate under the top personal income marginal tax rate. See also Fossen and Simmler (2012)



Source: ZEW(2011)

The economic literature provides ample evidence of a positive correlation between the level of corporate taxation and leverage. It goes beyond the aim of this section to review this literature exhaustively. Such a review is proposed by De Mooij (2011a) who uses 267 tax elasticities found in 19 studies to perform a meta-analysis. The mean tax elasticity across studies is 0.65⁷ (the median stands at 0.51) but with a large standard deviation of 0.57. Interestingly, 78% of the regressions have results that are significantly different from zero. The results also indicate that the response increases over time (i.e. this relationship becomes stronger) and that the relationship may not be linear. Finally, internal debt seems more responsive than external debt to taxation and short-term debt is more responsive than long-term debt. In terms of the impact on

⁷ In other words, a 10% increase in the tax rate (e.g. from 20% to 22%) leads to an increase in leverage by 6.5% (e.g. from 50% to 53.25 %).





debt to asset ratio, the consensus elasticity from de Mooij (2011a) lie at 0.28 for broad definitions of financial leverage⁸ and 0.17 for narrow definitions.

Turning to the specific case of financial institutions, Keen and de Mooij (2011) analyze a sample of 14,377 banks from 82 countries across Europe, Asia and the Americas between 2001 and 2009. They find that, on average, the leverage ratio of banks is 88.1%, compared to a ratio of between 40 and 60% for non-financial firms. This is strong indication that the leverage issue is more acute for banks. Next, they study the impact of taxes on the capital structure of banks and find that, despite capital requirement constraints, the size of the effects of corporate taxation on the financial structure of banks is close to the ones for non-financial firms. Such similarity is confirmed by Gropp (2011).

These large economic effects are not without consequences. Indeed, Adrian and Brunnermeier (2011) define systemic risk as CoVaR, the value at risk (VaR) of the financial system conditional on institutions being under distress. With this measure, the contribution of an individual institution to systemic risk is the difference between CoVaR conditional on the institution being under distress and the CoVaR in the median state of the institution. They show that leverage (alongside relative size and maturity mismatch) has an impact on systemic risk. In their regressions, they find 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 billion of systemic risk contribution.”*(Adrian and Brunnermeier, 2011, page 23). Increased

⁸ i.e. including non-debt liabilities (reserves, accounts payable to creditors, insurance and non-interest bearing liabilities).





leverage, which might partly stem from the incentives to debt in the tax system, leads therefore to increased systemic risks for financial markets.

4.2. Debt-shifting.

There is also evidence that the tax advantage of debt fuels profit-shifting activities. For example, Huizinga, Leaven and Nicodeme (2008) review the economic literature that considers the debt finance of multinationals with either parent companies or subsidiaries in the United States⁹, Germany¹⁰, Canada¹¹ and the EU¹². This literature is consistent with tax minimization objectives of firms using their financial structure and interest and income flows across borders. By shifting debt to the affiliate located in high tax countries, corporate groups are able to deduct interest payments against a higher marginal tax rate while the interest received by the lending affiliate is taxed at a lower rate. This leads to a decrease in the tax burden at the level of the group. Taking data from 32 European countries between 1994 and 2003, the authors find that a 10% increase in the tax rate increases leverage by 1.8%. As an example, for multinationals with two equal-size establishments in two countries, a 10% increase in the tax rate in one country leads to an increase in leverage of the company located in that country by 2.4% and a decrease in leverage in the affiliated foreign company by 0.6%, indicating debt-shifting.

5 IMPACT OF WELFARE.

Because of the tax bias, debt financing also creates a welfare cost. Weichenrieder and Klautke (2008) estimate this welfare cost at between 0.08% and 0.23% of GDP, while Gordon (2011) estimates it at about 0.25% of GDP. As rightly pointed by de Mooij (2011a), these

⁹ Hines and Hubbard (1990), Collins and Shackelford (1992), Froot and Hines (1992), Grubert (1998), Altshuler and Grubert (2003), Newberry and Dhaliwal (2001), Desai, Foley and Hines (2004), Mills and Newberry (2004).

¹⁰ Ramb and Weichenrieder (2004) and Mintz and Weichenrieder (2005).

¹¹ Jog and Tang (2001)

¹² Moore and Ruane (2005).





estimates assume an average elasticity that applies to a representative firm and fails to take into account the heterogeneity of responses and hence the additional welfare costs due to misallocations. They also fail to include the larger welfare costs of the negative externalities of using debt such as the systemic risk, the probability of default and the social costs of business cycle fluctuations. Finally, they do not take into account the distortions created by debt-shifting activities and the misallocation due to international tax arbitrage as well as the administrative and compliance costs (de Mooij, 2011a). Consequently, taking all these additional elements into account, the welfare impact can be assumed higher than what has been found in the literature so far.

6 POLICY OPTIONS TO CORRECT THE DEBT BIAS.

Several policy options are available which could limit the tax bias towards debt financing. Some of them are already used in practice, intentionally or not. For example, reducing corporate tax rates decreases the value of the tax shield for debt. Another option is to implement thin capitalization rules. The favourable tax treatment of debt offers opportunities for corporate groups to pursue debt-shifting strategies to minimize their total tax burden. To counter these avoidance strategies, countries have indeed increasingly adopted thin capitalization rules. Such rules are formal restrictions on the deductibility of interest paid by corporations that have 'excessive' debt compared to their equity or assets. Although the rules in place vary widely in terms of definitions and scope, their use has developed dramatically since the 1990s. They may lead to the disallowance of (excess) interest deductibility or, in some cases, to requalification as dividends. Several papers have found them effective to curb leverage (see e.g. Blouin et al., 2012, Buettner et al., 2012). A similar instrument, for example used in Italy and Germany since 2008, is an Earnings-stripping rule. This rule limits interest deductibility when the net interest expenses





exceed a defined percentage of the EBITDA. Alternatively, Shaviro (2011) also proposes worldwide interest allocation rules for multinationals but notes the technical difficulties of implementing such arrangement. He also mentions the possibility of applying full dividend exemption or imputation. This may however not suffice to correct the debt bias. In addition, it is only a corrective measure that does not target the core of the problem at the corporate level.

In principle, two more radical alternative designs of the corporate tax systems exist that might eliminate the distortion between debt and equity by treating both sources of finance in the same way: an Allowance for Corporate Equity (ACE) or a Comprehensive Business Income Tax (CBIT)¹³. The ACE would grant a deduction for return on equity (new or total equity) as it is the case for interest paid and would hence reduce or abolish the tax advantage of debt¹⁴. The CBIT system would achieve the same result by denying interest deductibility at the corporate income tax. ACE and CBIT have been discussed extensively in the economic literature (see e.g. de Mooij and Devereux, 2009, 2011).

6.1. CBIT

If designed in a revenue-neutral way, the CBIT would increase the tax base and allow decreasing the tax rate. Many recent policies have advocated in favor of such type of base-broadening-cum-rate-cut policies. This reasoning is largely based on the fact that the efficiency losses measured by deadweight losses are proportional to the square of the tax rate. It is also based on the idea that profit-shifting, investment and location of companies are somewhat linked to corporate tax rates. In such a case, one shall advocate for a CBIT.

¹³ Initially proposed by the US Treasury in 1992.

¹⁴ An ACE system is applied in Belgium since 2006 and Princen (2012) finds that it decreased the leverage of non-financial firms by between 2 and 7%. Italy and Latvia have also implemented such system recently.





Several aspects are however missing in this analysis. While there are indications that profit-shifting activities of corporate groups are mostly driven by the statutory tax rates, investment and location could be driven by effective (respectively marginal and average) tax rates, which include elements of the tax base. Next, the analysis differs if there are rents (i.e. above-normal return or super profits). This is because rents will only be affected by the tax rate not the base. Therefore, enlarging the base and decreasing the rate shifts the tax burden from rents towards the normal return, which might not be desirable. If rents are immobile (e.g. they are location-specific), this would create macroeconomic losses. If rents are mobile (e.g. they are company-specific), a CBIT could attract those rent-making companies and create macroeconomic benefits.

A CBIT is also not exempt of problems. As pointed by Shaviro (2011), CBIT carries some difficulties such as how to treat pre-existing (i.e. before the application of CBIT) debt and how to treat shareholder capital gains upon selling equity, as a possible capital gain exemption could create opportunities for tax avoidance. In addition, suppressing the interest deductibility can impact on hedging, increase the cost of capital and, all else equal, decrease firms values (Graham, 2011). The effect on bankruptcy is moreover also unclear. On the one hand, reducing leverage reduces the probability of defaulting but on the other hand, the increase in the cost of capital would increase the probability of defaulting. In the precise context of financial sector taxation, de Mooij (2011a) points to a possible under-taxation under a CBIT. This is because under a CBIT, interest paid is not deductible but interest received would not be taxed either to ensure symmetry. The (untaxed) difference is exactly the margins of banks on the deposits-loans activity. Borrowers would face the full tax burden, including the bank's margin. This system would in addition create a distortion between untaxed domestic banks and taxed foreign ones.





6.2. ACE

If designed in a revenue-neutral way, an ACE would achieve the opposite result than a CBIT by decreasing the tax base (which in turn would have to be compensated by increasing the CIT rate). The discussion above applies *mutatis mutandis* and again depends on the type of rents in the sector.

In practice, however, neither ACE nor CBIT need to be designed in a revenue-neutral manner. For example, the Belgian reform towards an ACE (the so-called *intérêts notionnels*) left the corporate tax rate unchanged and was a way to replace existing specific regimes (the Coordination Center regimes). In case the move to an ACE is done without changing other elements of the CIT, de Mooij (2011b) calculates that the fiscal cost is about 15% of CIT revenues on average (when increased investment¹⁵ and employment effects are factored in). This cost also depends on whether the ACE applies to new investment only or to the total existing stock of capital, in which case an ACE can represent a windfall. This mirrors the situation of CBIT. Here, ACE carries the difficulty of how to treat pre-existing (i.e. before the application of ACE) equity and how to treat shareholder's windfall gains. A non-neutral ACE reform also carries important political economy aspects as it can be perceived by the public opinion as a 'gift' to companies instead of a way to correct for the debt-bias distortion. An ACE also offers the additional advantage that, by allowing companies to deduct their cost of capital, it does not tax the normal return to capital and taxes rents only. It is therefore non-distortive for investment, bearing similar properties as a cash-flow tax.

6.3. ACC and combinations of ACE and CBIT

¹⁵ Even though Princen (2012) found no such effect for Belgium.





A variant of the ACE is the Allowance for Corporate Capital (ACC), which allow for the deductibility of a notional risk-free return to capital irrespective of whether it is in the form of equity or debt. It corresponds to the idea of a Business Enterprise Income Tax (BEIT).¹⁶ Both ACE and CBIT systems are appealing due to their efficiency properties with regard to the financing decisions of companies and an ACC corresponds to a combination of the two systems, i.e. a system that imposes limitations in the deductibility of interest but allows for a partial deduction in the return on equity, to respect revenue-neutrality.

A combined reform of a partial ACE and a partial CBIT mitigates the discrimination between debt and equity. One can therefore design a reform package of a partial ACE and partial CBIT that is revenue-neutral for the government and which is still neutral with respect to the financial structures of companies. First, this would preserve financing neutrality. Second, it would reduce possible negative effects of each of the pure ACE or CBIT systems. de Mooij and Devereux (2009, 2011) look at the design of corporate tax bases with respect to financing neutrality using ACE and CBIT systems as well as a combination of the two. The investigation of the tax distortions of investment financing and the possible measures against these distortions have been analyzed in a simulation model. The authors present simulations of different reform options, as well as comparing the implementation of ACE and CBIT as pure systems with a combination of both. These different types of reforms are investigated both for the case of individual implementation by each EU country - with the others sticking to their current tax systems - and for the case of a simultaneous implementation by all Member States. Under the assumptions of the model, it is shown that combining the two ACE/CBIT systems leads to the

¹⁶ See Boadway and Bruce (1984), Kleinbard (2007, 2011).





same neutrality in investment financing as each single reform but also improves welfare, both in the case of unilateral reforms and of EU-wide reforms.

Despite the advantages of financing neutrality, ACE or CBIT reforms can only be found in a very little number of Member States.¹⁷ The economic analysis shows however that moving to such systems could potentially bring substantial benefits in terms of reducing leverage, systemic risk and profit-shifting.

7 CONCLUSIONS.

This paper summarizes the main consequences arising from the deductibility of interest payments in the corporate income tax system, not coupled with such measure for equity financing. This tax-bias towards debt-financing distorts the capital structure of companies and offers possibilities of profit-shifting via a transfer of debt.

The welfare impact of this bias is relatively large as capital is misallocated by tax arbitrage (both between jurisdictions and types of financing) and risks are exacerbated by increased leverage and probability of default. Various policy options are available to remedy the bias with respective advantages and drawbacks. So far, however, they have only been implemented in a relatively small number of countries.

¹⁷ Belgium implemented an ACE system; Italy had ACE elements in its tax system but removed them after a short period. Germany limited interest deductibility which is a move towards CBIT. Italy has also limited the deductibility of interests thus moving towards a CBIT. Estonia has a CBIT system which does not allow interest deduction. Austria had implemented an ACE system from 2000 until 2003. It was replaced by a favorable tax treatment for retained earnings from 2004 until 2009 for individuals. As from 2010, an indirect instrument for encouraging the accumulation of equity of businesses of individuals (a tax free profit amount) was introduced. Finally, Latvia introduced an ACE as from 1 January 2009, in the case where a company is not distributing dividends partially or fully, taxable income is reduced by the amount of interest, which the company would have to pay for an equal loan.



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