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The Debt and Non-Debt Tax Shields Trade-Off: A Review

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Abstract

The trade-off between debt and non-debt tax shields has gained momentum among scholars and policymakers, especially in the current economic environment affected by the pandemic and the energy crisis. The literature on the tax shields trade-off arises from the theoretical framework by DeAngelo and Masulis (1980) and has developed over time in a fragmented manner in various disciplinary fields such as accounting, finance, and economics. Using a systematic literature review approach, this study provides an up-to-date survey of the theoretical and empirical literature examining the trade-off between classes of tax shields and its consequences for a firm's capital structure. The systematic analysis of the results of 46 studies supports the existence of an inverse relationship between debt and non-debt tax shields, consistent with a debt substitution hypothesis. However, conflicting evidence remains regarding this trade-off, as well as on its consequences for the corporate capital structure. More recent research also highlights the importance of considering several moderating factors when examining the relationship between debt and non-debt tax shields. This study encourages further research on the topic. Further investigation on the role of free cash flow and agency conflicts in explaining the tax avoidance-capital structure relationship is needed. Moreover, future studies may consider exploiting the exogenous shock provided by the recent Covid-19 crisis for an in-depth analysis of the impact of non-debt tax shield policies on the corporate capital structure.

Keywords: Non-Debt Tax Shields (NDTS), Debt Tax Shields (DTS), Tax Avoidance, Capital Structure, Cost-of-Capital

Introduction

This paper provides a systematic literature review on the trade-off between debt and non-debt tax shields (i.e., NDTS) and on its consequences for a firm's capital structure. Specifically, the study investigates, basing on the literature surveyed, the two following research questions: "Do firms trade-off debt with non-debt tax shields?" and "How the trade-off between debt and non-debt tax shields affect the composition and the cost of the capital structure?". Prior literature reviews have considered the link between taxation and capital structure (e.g., Graham, 2003; Graham & Leary, 2011; Feld et al., 2013; Jacob, 2022). However, since these reviews are much broader in their scope, only limited attention has been posed on the trade-off between debt and NDTS in capital structure decisions.

A review on the relationship between debt and NDTs is important for several reasons. First, the literature examining the trade-off between classes of tax shields have developed in a fragmented manner over time, across several disciplinary fields, including accounting, finance, and economics. More than 40 years after the seminal contribution of DeAngelo & Masulis (1980), who firstly investigated the firms' use of NDTs as a substitute for debt tax shields (DTS), it may be of interest to understand whether the early evidence provided by the Authors have been confirmed or, on the contrary, confuted by subsequent studies and what further knowledge we can now have on this relationship. Second, this review can also provide useful insights for policy makers, lenders, analysts, and other capital market participants. For example, depreciation deductions and tax loss carry forwards – both possible forms of tax benefits alternative to debt financing – are often used by regulators as an economic incentive for the business decision-making. It is thus of interest for a wide plethora of practitioners to better understand the consequences that such trade-off may have in terms of corporate capital structure.

Over the years, numerous financial theories have been developed with the aim of explaining the composition and the cost of the corporate capital structure (e.g., trade-off theory, pecking order theory). With different emphasis, most of the theories developed acknowledge taxation as a determinant of the corporate capital structure. In this sense, the firms' use of NDTs can be considered as a potential source of financing, the convenience of which comparatively evaluated against other sources of capital (e.g., debt and equity) (Richardson et al., 2015). The systematic analysis of the results of 46 studies show that the trade-off between debt and non-debt tax shields has a real effect on a firm's capital structure and can influence not only its composition, but also the associated cost-of-capital. Overall, the findings of the studies surveyed in this review support the existence of a substitutive relationship between debt and non-debt tax shields, as suggested by the framework developed by DeAngelo & Masulis (1980). However, conflicting evidence on such association remains, as well as several moderating factors found by recent studies.

This study can contribute to a better understanding of the research findings on the trade-off between debt and non-debt tax shields and on its consequences for a firm's capital structure in several ways. First, although there exists literature reviews examining the real effects of taxation (Hanlon & Heitzman, 2010; Wang et al., 2020; Jacob, 2022) and the determinants of corporate capital structure (e.g., Graham, 2003; Graham & Leary, 2011; Feld et al., 2013), no prior review has focused in detail on the trade-off between debt and non-debt tax shields and the consequences that such trade-off have on firm's capital structure. A specific focus on the trade-off literature is thus justified, also considering the increasing number of recent studies building on the framework developed by DeAngelo & Masulis (1980) to examine complex forms of non-debt tax shields such as tax aggressiveness and tax sheltering (e.g., Lin et al., 2014; De Vito & Jacob, 2021). Second, this review can be of interest for policymakers and regulatory authorities. Country-specific regulations affect the management's trade-off between debt and non-debt tax shields, with both intended and/or unintended consequences for a firm's capital structure. In the amid of the outbreak of the Coronavirus-related health crisis, the energetic crisis, and the Ukraine war, several regulators have expanded the set of non-debt tax shields available to firms as a form of incentive (e.g., allowing more lenient tax loss carryforwards regulations and/or generous tax depreciation policies). In this perspective, a better understanding of the research findings emerged from the academic literature can be helpful for those policymakers intended to promote a prompt recovery from the recent economic downturn. The paper is organized as follows. First, it provides a theoretical

overview on the role of taxes in the Theory of the Capital Structure. Second, it presents the methodology adopted to retrieve and analyze the bibliographical materials. Third, it critically analyzes the results of the research identified. Finally, the paper provides concluding remarks, highlighting potential avenues for future research.

Taxes and Corporate Capital Structure: A Theoretical Background

The recognition of taxation as a determinant of the capital structure can be traced back to the theoretical contribution of Modigliani & Miller (1958) argued that capital structure choices (e.g., debt vs. equity financing) do not alter the value of the firm (the so-called "*irrelevance proposition*"), if the following conditions are assumed: (i) absence of taxes, (ii) absence of transaction costs; (iii) absence of bankruptcy costs. In a correction article published in 1963, Modigliani & Miller underlined that the deductibility of interest expenses is an element able to influence capital choices, and, as such, to determine - *ceteris paribus* - a preference for debt financing over equity financing.

Starting from the early investigation by Modigliani & Miller (1958, 1963), subsequent theoretical models have further investigated the effects of corporate taxation, as well as of personal income taxes (e.g., on directors), on the capital structure. In this vein, Miller (1977) contributes to the then-emerging line of research with a re-examination of the tax advantages of debt in presence of personal income taxation. Kraus & Litzenberger (1973) and Castanis (1983) highlight the importance of pondering the cost of financial distress with the tax advantage of debt in the formulation of optimal capital structure decisions (so-called, "Trade-off Theory" or "Tax shelter-bankruptcy cost hypothesis"). Leland (1998) adds to the previous analysis of Castanis (1983) the crucial role of agency costs stemming the bondholders-shareholders' interests dealignment (Jensen & Meckling, 1986; Lasfer, 1995; Ashbaugh-Skaife et al., 2006). Finally, supporters of the so-called "Pecking Order Theory" (Myers, 1984, Myers, Majluf, 1984) proposed that, owing to information asymmetries, companies tend to prefer internal funding sources, such as, for example, retained earnings, to other external sources of financing, with debt financing usually preferred over the use of equity capital.

Within this stream of literature, De Angelo & Masulis (1980) were the first to study the effect of non-debt tax shields and of their trade-off with debt tax shields on corporate financing decisions. Basing on the framework developed by the Authors, following studies have further expanded the body of empirical evidence pertaining to such tradeoff. To this purpose, this study aims to answer the following research questions:

RQ1: "*Do firms trade-off debt tax shields with non-debt tax shields?*"

RQ2: "*How does the trade-off between debt tax shields and non-debt tax shields affect the composition and cost of the capital structure?*"

Research Methodology

Systematic Literature review approach

To answer the research question, this article uses a systematic literature review approach (Tranfield et al., 2003). This methodology is particularly suitable for this research for at least three main reasons. First, a systematic review, better than other methods, allows the researcher to retrieve articles through a rigorous collection procedure and to analyze them according to criteria of transparency and replicability that minimize the risk of incompleteness or interpretation bias (Massaro et al., 2016; Palmatier et al., 2018). Second, the systematic approach is well suited to examining quantitative studies that ground, from an epistemological point of view, on a positivist approach (Snyder, 2019). Third, the choice to

adopt a systematic approach ultimately lies on the nature of the research question formulated in this study. Snyder (2019) suggests that the systematic literature review approach is the most appropriate methodological choice for studies whose objective of analysis is constituted by the synthesis and comparison of evidence. Consistent with these arguments, this paper employs a systematic approach for the collection and the analysis of the identified studies.

This study uses SCOPUS, a bibliographic database provided by Elsevier, for the collection of the bibliographical materials to be included in the review. SCOPUS is one of the largest databases of peer-reviewed literature, widely adopted by the international scientific community (Burnham, 2006). The bibliographic material was collected following two distinct phases, namely: a “keyword search”, and a subsequent “snowballing search”. Both the phases were structured following specific research steps.

Keyword Search

In the “first step” of the keyword search, the paper defined a battery of terms that can having thematic affinity with the concept of tax shields. Specifically, the paper used the following keyword list: "tax shield*" OR "tax shelt*" OR "tax dodg*" OR "tax aggressive*" OR "tax avoid*" OR "tax minimiz*" OR "tax plann*" OR "tax risk*". Then, I added to the aforementioned list a set of terms that can be used to identify the concept of capital structure using the following terms: “capital structure” OR “debt” OR “equity” OR “cost of debt” OR “cost of equity”. Overall, this search led to the identification of 652 articles.

In the “second step”, the study applied a set of exclusion criteria based on the nature of the bibliographical material identified. I excluded contributions that do not qualify as scientific articles (i.e., "Document Type" (Article ONLY)), that are not published in the English language (i.e., "Language" (English ONLY)) and that do not appear in academic journal (i.e., "Source Type" (Journal ONLY)). I do not set exclusion criteria based on the time of the publication. Overall, the "second step" of the keyword research led to the exclusion of 112 articles. The total of residual articles after the "second step" is equal to 540.

Finally, in the "third step", I adopted a set of exclusion criteria based on quality of the academic journals. Given the large amount of studies identified, it was decided to follow a selective inclusion criterion. Specifically, while allowing the inclusion of papers belonging to different scientific fields (e.g., "Accounting", "Finance", "Economics", etc.), I retained into the sample only those papers published in a journal ranked as 4 or 4* according to the ABS 2021 Ranking. The ABS Journal Ranking, provided by the Chartered Association of Business Schools (CABS), is an authoritative guide to academic journals relevant to the area of business studies. The guide includes the main sector-specific journals, each of which is cataloged according to quality criteria (CABS, 2021). Overall, the "third step" of the research led to the exclusion of 483 articles. The total amount of articles remaining following the "third step" is equal to 57. At the end of the third research step, by reading each individual article selected, the research excluded those one that do not meet the conditions previously established and/or that only marginally deal with the topic of interest (so-called “sample cleaning”). The sample cleaning procedure resulted in the exclusion of 19 articles. The total of the remaining article is equal to 38, which constitute the sample identified by keyword search (n=38).

Snowballing Search

To minimize the risk of excluding relevant articles from the analysis, the research also carried out an additional bibliographical search following the so-called “snowballing procedure” (also

referred to as “snowballing search”). Specifically, starting from the sample of studies identified with the keyword search, the research verified the possible presence of additional studies suitable for inclusion, which could have been erroneously excluded and/or not included by the software used for research (e.g., Wohlin, 2014). The snowball search is a well-established practice in the systematic literature review procedures and has usually a complementary nature to the main literature search carried out by keywords (see, for example, Christensen et al., 2020; Breitenstein et al. al., 2021). As for the keyword search, the snowballing search was also carried out following specific and clearly identifiable research phases. Specifically, this study conducted a three-stage snowballing search.

In the “first stage” of the snowballing search, the research used the “view cited by” function provided by the SCOPUS database to identify a sample of articles that cited one or more articles among those already contained in the sample built through the keyword search (n=38). A total number of 3748 articles that cite, at least once, one or more articles previously identified was identified. Once again, the inclusion in the sample was limited only to the studies that met the criterion of a scientific article published in an English-language academic journal (i.e., “Document Type” (Article ONLY); “Source Type” (Journal ONLY); “Language” (English ONLY)). This criterion narrowed the sample of studies to be examined to 3235 articles. Basing on it, I proceeded to select only those that presented a certain thematic affinity with the object of the investigation, limiting the analysis only to those works that present in the title one or more of the keywords previously used (i.e., ((TITLE (“tax shield*” OR “tax shelt*” OR “tax dodg*” OR “tax aggressive*” OR “tax avoid*” OR “tax minimiz*” OR “tax plann*” OR “tax risk* ” AND “ corporate structure” OR “debt” OR “equity” OR “cost of debt” OR “cost of equity”)))). The criterion adopted led to the identification of 41 articles. To further guarantee the quality of the items detected, reference was made, also in this case, to the ABS guide. In this circumstance, however, I followed a less restrictive criterion than the one used in the keyword search, allowing the inclusion in the sample of articles that are published, at least, in a ABS journal ranked as 2 or more. This criterion of selection further narrows the sample of studies identified to 18 articles. Of these articles, the research only included those not previously detected with the keyword search. The total number of articles selected through the first snowballing procedure is 9. The total sample following the first snowballing phase is 47.

In the “second step” of the snowballing search, to further limit the risk of omitting relevant research on the topic under investigation, the “view citation overview” function of SCOPUS was used to identify the article that had received the most citations. The article with the most citations has already been included in the previous keyword search analysis. Consistently, no changes to sample are made at this stage. The total number of articles selected through this second step is equal to 0. The total sample following the second snowballing phase remains equal to 47.

Finally, in the “third stage” of the snowballing search, the study conducted a further check using the open access archive provided by SSRN (*Social Science Research Network*). The SSRN archive includes working papers of yet unpublished research in the field of social sciences and humanities. Although unpublished, some of the articles reported on SSRN may be already accepted for publication (so-called “forthcoming”), thus satisfying the standards of scientific quality ensured by the peer-review procedure. Through manual search on the SSRN archive, at the “Accounting Research” section, I then proceeded to identify any unpublished articles citing the most cited article of the analysis sample (i.e., De Angelo & Masulis, 1980). Specifically, using the SSRN function – “search within papers” – I typed “De Angelo & Masulis,

(1980)" into the search window provided by the search software. Among the articles identified, I proceeded to select only those that were accepted for publication by a 4-4* ABS level journal and containing in their title/abstract or keywords at least one or more terms among those already defined in the keyword search. Overall, through this phase, only one additional article was identified to be suitable for inclusion. The sample total following this third step of the snowballing procedure is equal to 48. At the end of the three steps of the snowballing search, the sample was finally cleaned up of those articles which, although suitable for satisfying the required research requirements, were only marginally linked to the topic in question. The sample cleaning procedure conducted at this stage led to the exclusion of 2 articles. The final number of articles included and examined is, therefore, equal to 46.

The Trade-off between Debt and Non-Debt Tax Shields

Academic literature suggests that taxation is a fundamental determinant of corporate financing decisions (see, *ex multis*: Wrightsman, 1978; Gupta, 1982; Cordes & Sheffrin, 1983; Hodder et al., 2003; Overesch & Wamser, 2014; Schepens, 2016; Abel, 2018; Fisher & Jensen, 2019). The NDTs are an essential part of the tax system of many jurisdictions and are able to influence both the composition and the cost of the capital structure (Graham & Tucker, 2006). With the term NDTs, scholars are used to indicate all those types of non-debt tax deductions, which can range from perfectly legal tax deductions in line with tax law (e.g., tax deductions on depreciation or for research and development activities) to forms of reduction of the tax burden obtained, instead, through aggressive interpretations of the tax law (e.g., tax avoidance/tax sheltering) (De Vito & Jacob, 2021). Both DTS and NDTs contribute to being deducted from taxable income and can influence not only the company's financial decisions but also the cost arising from such decisions (see e.g., Hackarth et al., 2007).

Basing on the sample of studies investigated, this research identified 3 key strands of the literature examining the tradeoff between debt and NDTs and its impact on the corporate capital structure. Particularly, through a thematic analysis of the studies considered, the research identified the following areas of investigation: (a) studies on the effect of the tradeoff between tax shields on the corporate capital structure decisions; (b) studies on the effect of the debt-NDTs tradeoff for a firm's cost of the capital structure; (c) studies examining the moderating role of agency conflicts on the relationship between tax shields and the corporate capital structure.

a. The Tax Shields Trade-off and Capital Structure Decisions

Following the seminal contribution by DeAngelo & Masulis (1980); MacKie-Mason (1990) was the first to empirically examine the effect that tax shields have on the choice between debt and equity, providing evidence that NDTs significantly affect debt policies and capital composition choices. Focusing on forms of NDTs such as tax losses carryforwards and R&D tax credits, the Author shows that NDTs can act as a substitute for the tax benefit that is expected from debt financing, allowing a firm to obtain a tax advantage without incurring into a simultaneous increase of the financial distress costs (see e.g., Castanias, 1983). In line with this intuition, the research also shows that the substitution effect is stronger for companies with a greater probability of losing the opportunity to deduct their debt tax shields, consistently with a tax exhaustion effect (Mackie-Mason, 1990).

To empirically confirm the existence of a substitution effect between the two classes of tax shields, Trezevant (1992) uses the setting provided by the Economic Recovery Tax Act to investigate the impact that NDTs have on corporate financing choices. The Economic

Recovery Tax Act was introduced in 1981 in the United States under the Regan presidency with the aim of replacing the previous depreciation system and introducing some important investment tax incentive schemes. As for Mackie-Mason's results, the study by Trezevant (1992) shows that the level of corporate debt is negatively associated with the level of NDTs and that such a negative association is enhanced for firms that are more likely to lose their deductions.

A role of NDTs in influencing corporate financing choices was also highlighted by (Graham, 2000). Investigating a sample of U.S. firms, the Author finds that companies tend to pursue, on average, conservative borrowing policies compared to the potential tax advantages of debt financing. The observed "under-leverage puzzle" can be explained, according to the study, as the result of four main factors: (i) the company size; (ii) the level of liquidity; (iii) the level of profitability, as well as (iv) the costs of bankruptcy. Specifically, firms that are more conservative in their leverage policies are those with bigger size, higher liquidity and profitability, and lower bankruptcy costs. *Prima facie*, the results of Graham (2000) may be perceived as "paradoxical". However, this is not the case if the availability of NDTs is considered. In a concurrent study, Newberry & Dhaliwal (2001) show that availability of NDTs is also important in determining intra-group financing decisions. Specifically, firms appear to carefully consider the legislation on tax losses carryforward, the presence of restrictions on tax credits usable, and the value of the tax deductions obtainable when making debt allocation decisions. Overall, the findings of the research of Newberry & Dhaliwal (2001) suggest that a different tax treatment of the interest expenses between jurisdictions, and the related legislation on NDTs, can be important consideration in the tax planning of many globally active firms.

Retracing the line of the research undertaken by Graham (2000); Graham et al (2004) examine the aggregate level of tax savings from employee stock options for a sample of Nasdaq 100 and S&P 100 firms. The authors show that options-related tax deductions are a significant source of tax savings and that they can explain, at least in part, a potential reason of why companies may choose to pursue conservative debt policies compared to those that the tax advantages of debt might suggest. The findings of Kahle & Shastri (2005) and those of Babenko & Tserlukevich (2009) also confirm the economic importance of stock option tax deductions in corporate financing decisions¹. Interestingly, Babenko & Tserlukevich (2009) show that stock options deductions are a significant source of savings for firms, accounting for almost a 12.6 million of tax savings in a sample of Nasdaq 100 & S&P companies 500 examined between 2000 and 2005. However, option deductions are only a potential form of NDTs and may not, per se, fully explain the "under-leverage puzzle". Along these lines, Shivdasani & Stefanescu (2009) show that, in addition to options deductions, tax savings arising from pension contributions can also offer another relevant tax shield alternative to debt. Specifically, the Authors show that a 1% growth in pension liabilities over total assets is associated with a reduction in leverage, calculated as the ratio of debt to total assets, by 0.36 percentage points.

¹ Using the database "2000-S&P's ExecuComp", Kahle & Shastri (2005) show the existence of a negative association between the size of the tax deductions associated with stock options and short- and long-term debt. Despite the evidence of an inverse relationship, another relevant insight is offered by the study of Kahle & Shastri (2005), which is a potential different impact of NDTs on short-term, and long-term leverage policies. Specifically, while changes in the level of medium/long-term debt is associated with changes in the number of stock options exercised, similar evidence cannot be found in the case of changes in short-term debt.

To further shedding lights on the effect of tax sheltering activities on corporate debt policies, Graham & Tucker (2006) examine a sample of 43 publicly traded firms accused of having participated in illegal tax shelving activities, for the years 1975-2000. The research shows that the tax sheltering activities have a statistically and economically significant impact on the corporate debt policy: companies that actively participate in tax shelters show, on average, debt-to-asset ratio values that are 5% lower than that of companies that do not resort to tax shelters, irrespectively to the type of tax shelter used². Although the results of this study constitute an important empirical confirmation of the role of the NDTs in influencing firms' debt choices, the research is not without limitations, mainly pertaining to the limited number of companies being analyzed.

To mitigate the limitation of the small sample size, Wilson (2009) elaborates a metric that allows to predict, *ex-ante*, the probability that a company is participating in a tax shelter. Subsequent empirical studies have used the score developed by Wilson (2009) to expand the empirical evidence on the relationship between tax shields tradeoff and capital structure decisions.

More recent research has also examined more complex forms of NDTs such as, tax avoidance and tax aggressiveness, particularly with respect to non-US sample. Among the research conducted outside the U.S., Lim (2011) examines a sample of Korean companies. Lanis et al. (2021) study a sample of Australian firms, while De Vito & Jacob (2021) examine a sample of Italian and European firms. Overall, the aforementioned studies confirm the existence of an inverse relationship between debt and tax avoidance as also found in the U.S. (Lin et al., 2014; Seidman & Stomberg, 2017). These studies, however, have the merit to add the literature with new, relevant, insights. In this sense, Lim (2011) suggests that a higher level of tax avoidance not only reduces corporate debt, but also the cost of debt required by the financial market. Richardson et al (2014) show that the negative association between debt and tax avoidance can be strengthened by certain corporate governance features such as the presence of outside directors in the board of directors (BoD). Similarly, Lanis et al (2021), suggest that the debt substitution effect is more pronounced in firms having in their BoDs outsider directors with adequate financial preparation.

Besides the moderating role provided by the corporate governance characteristics, an additional moderating factor affecting the trade-off is also represented by the institutional characteristics of the country examined. In this regard, De Vito & Jacob (2021) examine the impact of creditor rights protection systems on the relationship between bank debt and tax avoidance, finding that, in legal systems with higher creditor protection, the inverse relationship between debt and tax avoidance is attenuated³.

Finally, the research on the tax shields tradeoff and on its impact in the determination of a tax optimal capital structure cannot undermine the influence exerted by the increasingly

² It is important to recall that firms undertaking conservative leverage strategies do not always benefit of a tax-efficient capital structure. In this sense, in a re-examination of the tax benefits of debt financing, Blouin (2010) indicates that most firms do not seem to deviate substantially from a hypothetical tax-optimal capital structure, once the costs of financial distress and the presence of NDTs are taken into account. In the same vein, Ju et al. (2005) show that the deviation from the optimal combination of the capital structure is not accompanied by particularly high costs, thus suggesting a relative economic feasibility of corporate debt policy adjustments (Ju et al., 2005).

³ The results of De Vito & Jacob (2021) match with those offered by Calegari (2000), who examined the impact of the tax law on the companies' financing decisions

growing "off-balance sheet" financing and that one pertaining to intra-group resources' allocation. With reference to the first aspect, Lim et al (2017) show that leases are associated to a less marked influence on financing costs and credit ratings, compared to the on-balance sheet financing, especially for constrained companies or firms with ability to use their TS. With reference to the second aspect, Overesch & Wamser (2014) find that the tax benefit of debt financing in intercompany transactions decreases in relation to the amount of tax losses that can be carried forward by the subsidiary receiving the loan; while it increases in relation to the amount of tax losses held by the company disbursing the loan.

b. The Tax Shields Trade-off and the Cost-of-Capital

It is a common stand in the finance literature that leverage financing increases the bankruptcy costs and the expected cost of debt (Abel, 2018). Consistently, Lin et al (2017) find that firms relying on off-balance sheet financing have a lower likelihood to bear high financing costs and lower credit ratings. In a similar vein, certain studies argued that, by substituting debt for tax avoidance, firms may benefit from a lower cost of debt and a lower default risk (Lim et al., 2011; Croce et al., 2012; Isin, 2018). However, compared to off-balance sheet financing, the use tax avoidance as a source of financing can have unexpected consequences for the cost-of-capital structure. Shevlin et al (2020) find that tax avoidance increases the risk of financial default, owing to higher cash flow volatility and poor financial reporting quality.

Ex-ante, the relationship between tax avoidance and the cost of equity may be ambiguous. On the one hand, a higher level of tax avoidance can increase the shareholders' risk owing to a higher cash flow volatility. On the other, the shareholders could benefit from higher tax avoidance, due to an increase in the level of expected cash flow. The findings of the research by Goh et al (2016) show that the second mechanism prevails on the first one. As a result, a higher level of tax avoidance reduces the firm's risk-adjusted cost of equity. This evidence is also partially confirmed by Heitzman & Ogneva (2019), who show that there is a positive relationship between industry tax planning and shareholder's returns. Yet, at a firm level, different type of tax avoidance activities may have different effect on the expected cost of capital. Lewellen et al (2021) show that group incorporation in a tax haven is positively associated with the cost of equity capital, suggesting that shareholders perceive aggressive level of tax avoidance as potentially detrimental for their expected level of return. Specifically, the negative relationship provided by the Authors is enhanced in presence of risks, including: (i) tax risks; (ii) informative risks; (iii) legal and country-specific risks.

Overall, extent research on the relationship between tax avoidance and the cost-of-capital provided mixed results. On the one hand, a higher level of tax avoidance may increase the expected cash flow, thus reducing the cost of capital required by the shareholders and bondholders. On the other, a higher level of tax avoidance may reduce the cost of capital, owing to a higher volatility of cash flow and higher risks. These studies, however, do not consider the potential moderating effect of agency conflicts. In the following paragraph, the paper reviews the literature that examine the relationship between tax avoidance and cost-of-capital in an agency framework.

c. The Tax Shields Trade-off and the Cost-of-Capital: The moderating role of Agency Conflicts

Potential agency conflicts between shareholders, managers and creditors could affect the expected relationship between tax avoidance and the cost of the capital structure and can explain, at least in part, some of the inconsistencies in the empirical findings emerged so far⁴.

Corporate shareholders and bondholders may have different expectations on tax avoidance activities. Bonsall et al (2017) show that rating agencies often disagree in the assessment of the firm's tax planning practices, especially for firms with higher level of tax aggressiveness, as reflected by a higher portion of unrecognized tax positions. Similarly, Hasan et al (2014) suggest that the bondholders (i.e., fixed claimants) are more likely to negatively perceive tax avoidance practices, as bearing the risks stemming from such activities without modifying their expected returns. The results from Platikanova (2017) indicate that lenders perceive tax avoidance as a potential source of risks, thus providing debt with short-term maturity to firms with greater level of tax avoidance.

On the other hand, shareholders (i.e., residual claimants) could perceive tax avoidance activities as potentially value-enhancing, due to an increase in the expected level of future cash flow (Hasan et al., 2014). Such expectations, however, could be reverted in presence of high agency conflicts between the shareholders and the managers. In this case, a higher level of tax avoidance can be interpreted by the shareholders as a higher level of risk and/or as a potential signal of management discretion, thus penalizing the firm with a higher cost of capital. Kim et al (2011) finds higher stock price crash risk in firms engaging greater level of tax avoidance.

Although the interests of the shareholders are often in contrast with that one of the bondholders, an appropriate structure of management incentives and/or the presence of corporate governance mechanisms can help realigning such interests. Yet, whether a realignment of interests result in higher or lower tax avoidance is still an open research question. Tang et al (2022) contributed to uncover this blind spot in the literature, showing that firms with simultaneous debt and equity participation in the same company (i.e., dual holdings) are more likely to engage tax avoidance, especially in the presence of short-term investors in their ownership structure. This result might suggest that, while the creditors (i.e., fixed claimants) and the shareholders (i.e., residual claimants) may have different expectations on tax avoidance, dual holdings decrease agency costs of debt, thus minimizing the incentive of managers in undertaking asset substitution activities. In this sense, the results of Tang et al (2022) indicate that firms with lower agency conflicts, as framed by the presence of dual holders, are more likely to engage higher level of tax avoidance and to benefit, on average, of a lower cost-of-capital.

⁴ Prior research has provided results overall consistent with the DeAngelo & Masulis' hypothesis, also when extending the framework towards more complex form of tax dodging strategies, such as aggressive tax sheltering and tax-motivated income shifting. However, there has been studies reporting conflicting results with respect to the debt substitution hypothesis. At this regard, Dammon & Senbet (1988) highlighted several limitation pertaining to the analytical model developed by De Angelo & Masulis (1980), suggesting that the inverse relationship between DTS and NDTs might not hold in the case of an optimal adjustment of the investment function. Similarly, Lin et al (2014) show that the substitution effect does not hold in firms with higher level of profitability. However, as suggested by MacKie-Mason (1990); Graham (1996), a potential limitation of these research pertain to the fact that the NDTs can also be a proxy for the firm's profitability, which is positively associated to the firm's level of indebtedment, thus confounding the interpretation of the results.

Other studies, however, show that a better alignment of interests between the shareholders and the bondholders can reduce the firm's incentive to engage tax avoidance activities. Examining the effect of a potent alignment mechanism such as the CEO compensation through debt-based instruments (e.g., Gul et al., 2021), Chi et al (2017) show that, in presence of debt holdings, the CEO would act as a fixed-claimant, reducing the engagement in high-risk activities that can increase the volatility and uncertainty of future cash flow, such as aggressive forms of tax avoidance. The results from Chi et al (2017) can provide an alternative reason on why firms do not exploit all the available DTS. Specifically, a firm may forego the opportunity to benefit from the use of it DTS not only because of the presence of alternative NDTs, but also because of a firm's risk-adverse posture. This, in turn, may suggest why firms with higher agency conflicts usually have sub-optimal leverage structure, especially in context characterized with a high level of uncertainty (Lambrecht e Myers, 2017; Hackbarth et al., 2007; Im et al., 2020)⁵.

Conclusions

This literature review analyzes the trade-off between debt and non-debt tax shields and its consequences for a firm's capital structure. The study shows that NDTs represent a relevant source of financing for many firms, through which to potentially replace other costlier source of funds, consistent with a debt substitution hypothesis (DeAngelo and Masulis, 1980). Overall, the literature surveyed indicates that the NDTs have a real effect on a firm's capital structure and can influence not only the composition but also the cost of the capital structure. Some contrasting evidence however remains, in addition to several moderating factors pertaining both to the internal (e.g., level of profitability) and external (e.g., creditors' protection) firm's environment. Future research on the impact of institutional factors on the choice between DTS and NDTs is certainly to be encouraged to further develop academic knowledge on the subject, as well as to guide policymakers towards the definition of shrewd fiscal incentive instruments. Future studies can investigate the role of additional moderating variables in affecting the trade-off such as the impact of the ownership structures (e.g., private vs. public firms; family vs. non-family-owned firms).

The existence of NDTs is due the presence of specific tax rules that favor alternative deductions to debt. These factors are an integral part of the policy agendas of many countries. Particularly, following the spread of the state of health emergency linked to the coronavirus pandemic (i.e., the COVID-19 crisis), numerous tax initiatives have been undertaken by legislators with the aim of supporting businesses and ensure business continuity. In this sense, future research can explore the patchwork of fiscal policy interventions undertaken during the pandemic to enrich knowledge on NDTs as determinants of firms' capital structure (Baldwin & Mauro, 2020; Becker et al., 2021).

⁵ There are contexts in which tax benefits of debt can help creating value for the shareholders. While there is no agreement in the literature on how to calculate the value of debt tax shields (see: Fernandez, 2004; Cooper & Nyborg, 2006). Kemsley & Nissim (2002) suggest that the estimated value of the debt-related tax benefits represent almost 40 % of the outstanding debt value in the firm's balance-sheet, accounting for roughly a 10% of the overall corporate value. This latter value can be even higher for those firms with a higher debt capacity, such as those one with a higher productive flexibility (Mauer & Triantis, 1994)

Finally, future research could also delve in deep on the Agency Theory as a theoretical framework through which to interpret the tradeoff between debt and non-debt tax shields. For example, the free cash flow hypothesis and debt monitoring hypothesis (see Jensen, 1986, 1988, 1989; Gul, 2001) are still considerably overlooked in this literature. Yet, the integration of these theoretical frameworks with that one of DeAngelo & Masulis (1980) could pave the way for future empirical research examining the association between tax avoidance and optimal capital structure decisions.

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