Tax Avoidance and Cost of Debt: The Case for Syndicate Risk Mitigation and Public Bond Markets

ABSTRACT

Examining the syndicate loans market for publicly traded U.S. firms I show that tax avoidance is positively related to loan spreads. This positive link holds for alternative forms of tax avoidance and is more pronounced for firms with financial constraints and information asymmetries. Moreover, I show that the positive link between tax avoidance and loan spreads is largely eliminated for loans with effective risk mitigating mechanisms in place where lenders either align borrowers' interests with theirs and/or are able to diversify away loan-specific risks. Notably, these risk mitigating mechanisms are more effective at moderating tax-specific risk premiums for firms with larger financial constraints and information asymmetries. Finally, I find that simultaneous access to private and public debt financing, which reflects greater firm-level financial flexibility and lower hold-up problems, mitigates agency risks associated with all forms of tax avoidance. These results help identify channels through which firms can mitigate non-tax costs associated with tax avoidance and hence, effectively pursue strategies that persistently reduce their corporate tax burden without incurring material agency costs.

Keywords: Tax avoidance, Cost of debt, Agency costs, Contract design and risk mitigation, Financial constraints, Information asymmetries

1. INTRODUCTION

Since the establishment of the "under-sheltering" puzzle (Weisbach, 2002) the literature in corporate taxation seeks to identify why some firms engage in greater levels of tax avoidance compared to others. In an effort to do so, some studies focus on contracting costs of tax avoidance to pinpoint non-tax costs associated with tax avoidance (Shevlin, Urcan and Vasvari, 2013; Hasan et al., 2014), which is an important avenue to examine on three accounts. First, the past decade witnessed the proliferation of corporate tax avoidance among corporations (GAO, 2008; 2016) where firms utilize avoidance strategies that lie in the grey areas of tax laws that push interpretation boundaries (e.g., Hanlon and Heitzman, 2010). Second, while providing significant real (i.e. cash) and/or financial benefits to corporations, tax avoidance strategies also increase firm-specific risks via tax-positional uncertainties (McCarty, 2012; Drake, Lusch and Stekelberg, 2015; Hutchens and Rego, 2015; Chaudhry, 2016). Finally, while the anticipated benefits (real/financial) from tax avoidance largely accrue to shareholders, creditors, given their fixed claims on firm performance, fully anticipate risks associated with tax avoidance (Hasan et al., 2014). In fact, recent evidence links tax avoidance with managerial rent extraction (Desai and Dharmapala, 2006, Desai, Dyck and Zingales, 2007), aggressive (Frank, Lynch and Rego, 2009) and non-transparent financial reporting (Balakrishnan, Blouin and Guay, 2011) – which are likely to further increase agency costs associated with corporate tax avoidance.

In line with the agency-theoric understanding, the literature documents significant contractual costs associated with tax avoidance (Shevlin, Urcan and Vasvari, 2013; Hasan et al., 2014) – arguing that tax avoidance escalates significant agency-specific risks. Importantly, however, while documenting significant contractual costs associated with tax avoidance, these studies do not incorporate some of the most critical aspects of innovative loan formation and contractual design alternatives emerged as a result of intensified competition in corporate lending business over the past two decades. Accordingly, the evidence so far disregards potential benefits achieved through innovative financing structures (e.g., Simon, 1993; Rajan, 2005; IMF, 2006; Mora, 2015) and how these innovations help alleviate and/or cater for alternative firm-specific risks such as corporate tax avoidance. For example, with the enactment of Gramm-Leach-Bliley act in 1999, which removed firewalls between commercial and investment banking activities, competition for corporate lending business has significantly intensified among banks and non-bank financial intermediaries (Gande, Puri and Saunders, 1999; Puri, 1999; Armstorng, 2003; Altunbas, Kara Marques-Ibanez, 2009). Moreover, as a result of competitive lending environment and the increased involvement of independent rating agencies in syndicated loan markets, lenders increasingly apply flexible borrowing terms that cater for the particular needs of borrowers with

different risk profiles (e.g., Becker and Ivashina, 2016), while at the same time ensuring borrower-lender incentive alignment.

In this paper, I re-examine contracting costs associated with corporate tax avoidance by focusing on priori un-explored syndicate-level risk mitigating mechanisms and their role in alleviating agency costs associated with tax avoidance. In doing so I focus on alternative loan formation and contractual design structures which facilitate credit risk diversification and/or borrower-lender incentive alignment. Specifically, I perceive larger lead-level syndicate participation as a syndicate formation strategy that helps diversify-away some of the loan-specific risks (e.g., Simon, 1993; Armstrong, 2003; BIS, 2003; Shivdasani and Song, 2007; Mora, 2015), including those associated with aggressive levels of tax avoidance. Next, I control for performance pricing provisions (PPPs) which provide early screening process and mitigate (*ex-ante*) moral hazard and adverse selection problems that might occur among the lending group (Asquith et al., 2005; Manso et al., 2010) and between lenders and borrowers (Jensen and Meckling, 1976). These provisions are hybrid monitoring mechanisms that utilize price and non-price terms simultaneously (Ball et al. 2008) and are favorable from borrowers' perspective given that loan spreads is tied to firm performance (Asquith, Beatty and Weber, 2005).[1]

At the heart of my argument lies the expectation that, amidst the intense competition in corporate lending business, lenders might be incentivized to utilize loan formation structures that enable them to accommodate more firm-level risks, including those associated with corporate tax avoidance. Moreover, lenders and borrowers may also agree on flexible performance pricing provisions that adjust loan spreads depending on the pre-determined performance metrics and substantially transfer potential cash flow (IRS settlements) and reputational risks (if any) associated with aggressive tax avoidance (back) to borrowers. If these syndicate-level risk mitigating mechanisms facilitate credit risk diversification and/or borrower-lender incentive alignment as overwhelmingly argued (e.g., Simon, 1993; Armstrong, 2003; BIS, 2003; Mora, 2015; Asquith et al., 2005; Manso, Stulovici and Tchistyi, 2010), then creditors might have the appetite to tolerate more tax-specific risks. In that case contracting costs associated with tax avoidance are likely to be lower than previously documented

[1] Examining loan price terms associated with PPPs, Asquith et al. (2005) find lower spreads for contracts with interest increasing performance pricing. However, one should note that, as Asquith et al. (2005) also documents, both interest increasing and decreasing performance clauses are effective at mitigating adverse selections risks. Therefore, to the extent that these provisions generate borrower-lender incentive alignment, lenders might alternate between higher yields and looser non-price terms or vice versa (e.g., Stein, 2013; Becker and Ivashina, 2016) depending on macro/micro economic conditions. Either case borrowers are likely to generate contractual benefits which is the fundamental motivation underlying my analysis.

(Shevlin et al., 2013; Hasan et al., 2014) which provides agency-theoric explanation as to how corporations can attain persistently low tax rates (e.g., Dyreng et al., 2008) without incurring material agency-specific costs.

Using a sample of 6456 loan facilities and broad measures of corporate tax avoidance, baseline results indicate a positive link between tax avoidance and loan spreads. The average effect of tax avoidance on loan spreads is economically meaningful. Using the coefficients for CETRs in Table 2 as a reference, a standard deviation (0.14) increase in tax avoidance results in 7.50BPS increase in loan spreads. For a mean loan facility this tax avoidance premium corresponds to $554,250 ($739MN × 7.50BPS) additional interest cost per year. Given four year average loan term a standard deviation decrease in CETR results in $2.22MN (4 × $554,250) additional premium for an average borrower.[2] The analysis further reveals that the required risk premium for tax avoidance is more pronounced for firms with financial constraints (non-rated and non-investment grade firms).[3] Next, I investigate moderating effects, if any, of syndicate-level risk mitigation mechanisms on additional risk premiums required for tax avoidance. Results show that the larger syndicate-lead formation, which facilitates credit risk diversification, and loans with performance pricing provisions, which reduce borrower-lender frictions, mitigate substantial portion of additional risk premiums demanded for tax avoidance.[4] In economic terms focusing on cash ETRs, larger syndicate-lead formation and the existence of performance pricing provisions mitigate, on average, 44% to 75% of the additional risk premium required for tax avoidance, respectively. More important, these risk mitigating mechanism work more effectively for firms with financial constraints and information asymmetries. For example, focusing on cash ETRs, the existence of performance pricing provisions mitigates 89%/(98%) of the additional risk premium required for tax avoidance by firms with financial constraints/(information asymmetries), respectively.

---

[2] To compare, these numbers are significantly higher than those observed ($1MN additional cost for tax avoidance) in Hasan et al. (2014). One of the main reasons for this results is the fact that, unlike Hasan et al. (2014), I do eliminate loss-making firm years for interpretational purposes. As a results my sample is likely to include larger firms that are able to have access to significantly larger amounts of financing. My result hold when I run the same analysis using quintile regressions at the median and/or sample composition that is winsorized at the 1st and the 99th percentiles that control for the influence of outliers.

[3] In un-tabulated analysis I find no link between non-price contract terms and aggressive level of tax avoidance which indicates banks preference to use price-based protection against tax-specific risks (see section 4.6 for further discussion).

[4] I also test for the effects of total number of syndicate participation and lead arranger reputation in moderating ex-ante risks related to tax avoidance. Although I observe similar risk-moderating effects for all of these risk-mitigating factors available to lenders, these moderating effects do not consistently extent to risks related to tax avoidance when performance provision and syndicate-lead formation variables included. For the brevity of the study I do not report these analyses and further discuss these alternative risk mitigating mechanisms and potential reasons for my observations in sections 4.6 and 5.

Next, I control for plausible self-selection into performance pricing provisions (PPPs) and issues with larger number of lead arrangers using propensity score matching (PSM).[5] Accordingly, I run the same analyses on sub-samples that match firms based on their observable characteristics and leave out issues with performance provision clauses and greater number of lead arrangers as treatment effects. Results using PSM analysis validate the effectiveness of loan-facility risk management mechanisms in moderating agency costs associated with tax avoidance.[6]

Finally, I investigate the effects of having access to public bond markets on contracting costs of tax avoidance including the general understanding that corporate public debt markets assume greater premiums for tax avoidance (e.g., Hasan et al., 2014). Both theoretical and empirical work in capital structure literature argue on the concept of "*reputation acquisition*" argument where firms grow out of bank-specific lending towards arm's length financing as they gain credibility over time (Diamond, 1989, 1991; Datta, Iskandar-Datta and Patel, 1999; Cantillo and Wright, 2000; Denis and Mihov, 2003; Faulkender and Petersen, 2006; Colla, Ippolito and Li, 2010; Lin et al., 2013) to benefit from looser covenant structures inherent in public debt financing (e.g., Gilson and Warner, 1997; Verde 1999). More important, evidence also suggests that firms tend to diversify-away from bank financing towards public debt financing, even if their banks are willing to lend more, (Rajan, 1992; Gilson and Warner, 1997) to mitigate inefficient contracting costs they face with their existing banks as a result of information monopolies (hold-up problems) (Rajan, 1992, Houston and James, 1996; Santos and Winton, 2008; Hale and Santos, 2009; Ioannidou and Ongena, 2010; Schenone, 2010). In fact, initiating access to public debt markets reveals new information to public bond investors and to priori un-informed competitor banks which results in lower bank loan spreads in the post-issue period for priori bank-dependent firms (Santos and Winton, 2008; Hale and Santos, 2009; Ioannidou and Ongena, 2010). Moreover, initial access to public debt markets initiates long-lasting financial flexibility (Cantillo and Wright, 2000), enabling firms to effectively choose between public vs bank financing depending on industry and/or market specific conditions (James and Smith, 2000). These arguments are more pronounced for syndicated loan markets as Sufi (2007) shows that firms from all levels of credit spectrum, from privately held unrated firms to investment-grade public firms, actively participate in this market. Strikingly, however, the literature examining contracting costs of tax avoidance implicitly assumes that firms hold either bank-originated or arm's length public debt financing but not both

[5] The details of the logistic regression for the matching procedure are given in Appendix B.
[6] In un-tabulated analysis I also use Heckman two-stage procedure to control for potential self-selection bias into performance pricing provisions and issues with larger number of lead arrangers. My results are qualitatively the same using Heckman procedure in comparison to PSM analysis.

facilities concurrently (Shevlin et al., 2013; Hasan et al., 2014). Therefore, the evidence in hand do not incorporate theoretical and empirical evidence provided in capital structure literature.

Based on the above discussion, I argue that the ability to access to public bond markets is an indication of "*acquired credibility*" which reflects, in *retrospective thinking*, greater firm-level information environment and financial flexibility.[7] Accordingly, I conjecture that simultaneous access to both public and private debt financing will, to an extent, alleviate tax-specific informational asymmetries and offset related risk premiums required for tax avoidance. Using around 2400 public bond issues matched to the syndicated loan sample I compare contracting costs of tax avoidance for firms with and without outstanding public debt where the latter group is likely to have greater information asymmetries and/or financial constraints. In line with priori expectations, the magnitude of the positive link between tax avoidance and loan spreads are economically (and statistically) larger for firms with no access to public debt markets in comparison to firms that do. In fact, for a given standard deviation (0.14) decrease in cash ETRs, access to bond markets alleviates more than half (4.86BPS) of the additional risk premium required (9.15BPS) for tax avoidance. I obtain both qualitatively and quantitatively similar results using sub-samples that match firms based on their observable characteristics leaving public debt market access as a treatment factor. Furthermore, access to public debt markets and syndicate-specific risk mitigating functions are, in general, incrementally effective at moderating risk premiums for tax avoidance and complement one another. Finally, I show that public debt holders demand higher spreads for tax avoidance but only for high-yield bond issues. The magnitude of this positive link is economically significant where a standard deviation (0.14) decrease in cash ETRs for firms that issue high-yield (junk status) bonds increase issue spread by 17BPS on average.

Overall, the paper makes several notable contributions to both accounting and finance literatures and extend the evidence that examines contracting costs of tax avoidance in a number of aspects. First, I confirm that creditors, on average, perceive tax avoidance as risky endeavors (e.g., Shevlin et al., 2013; Hasan et al., 2014) particularly for firms with financial constraints and information asymmetries and appropriately price in additional tax-specific risk premiums. Accordingly, while providing vital liquidity to firms with financial constraints (Ayers, et al, 2011; Edwards et al., 2016), tax avoidance results in relatively higher additional contracting costs for these

[7] In this paper, I am neither interested nor capable of (given data constraints) testing theoretical models of capital structure (e.g., Diamond, 1989, 1991) using forward looking models as conducted in Datta et al. (2011). Accordingly, I define the term *acquired credibility* as a backward looking (static), rather than forward looking, proxy for firms' financial and/or informational credibility.

firms. On the other hand, I show that the positive link between tax avoidance and loan spreads is largely eliminated for syndicated loans with larger syndicate-lead formation and/or performance pricing provisions that facilitate credit risk diversification and borrower-lender incentive alignment, respectively. More important, these loan-specific risk mitigating mechanisms are more effective at moderating economically (relatively) larger positive link between tax avoidance and loan spreads observed for firms with financial constraints and information asymmetries. These results suggest lower contracting costs to tax avoidance than previously documented (Shevlin et al., 2013; Hasan et al., 2014) when lenders either align borrowers' interests with theirs and/or are able to diversify loan-specific risks, including those related to tax avoidance.

Moreover, finance and banking literature reason on risk diversification benefits of syndicated loan structures without providing empirical tests supporting these theoretical arguments (e.g., Simons, 1993; Armstrong, 2003; Mora, 2015). To the best of my knowledge, this is the first paper to empirically model and test the effectiveness of risk diversification mechanisms available in syndicated loan facilities in alleviating ex-ante risks related to a particular risk-taking incentive (i.e., tax avoidance).

Furthermore, extending the analysis in previous studies (Hasan et al. 2014, Shevlin et al., 2013), I show that simultaneous access to public and private debt markets effectively mitigates agency costs related to all forms of tax avoidance strategies. These observations extend the empirical evidence on the contracting costs related to inefficient hold-up problems associated with bank financing (Santos and Winton, 2008; Hale and Santos, 2009; Ioannidou and Ongena, 2010). Altogether, the analysis reveals potential use of alternative contract design mechanisms through which tax-specific risks are either diversified-away among the syndicate-lead and/or largely assumed by the borrower in question via performance provisions. Therefore, the study provides a new and an important perspective into contracting costs of tax avoidance within an agency framework (Hanlon and Heitzman, 2010) and adds to the link between banks and tax avoidance incentives documented in the prior literature (Gallemore, Gipper and Maydew (2016). Pertinent to the ongoing research agenda in tax literature (see Hanlon and Heitzman, 2010), these results help identify channels through which firms might mitigate non-tax costs associated with tax avoidance that enables them to pursue tax avoidance strategies that persistently reduce corporate tax burden without incurring materially large agency costs (e.g., Dyreng et al., 2008; GAO, 2008; 2016).

2. INSTITUTIONAL KNOWLEDGE and HYPOTHESIS DEVELOPMENT

2.1. The Link between Tax Avoidance and Cost of Debt Financing

Corporate taxes make up a sizeable portion of total profits, hence provide managements with fundamental incentives to pursue tax avoidance strategies that aim to reduce firm-level tax burden (e.g., Desai et al., 2007). For example, recent GAO (2016) report documents that U.S. corporations that file Schedule M-3 forms paid only 13 percent of their pre-tax worldwide income in U.S. federal income taxes. This ETR level reaches to 17 percent when foreign, state and local income taxes are included – a ratio much below the statutory 35 percent. More so, around 55 percent of all large U.S.-controlled corporations reported no federal tax liability in at least one year between 1998 and 2005 GAO (2008). Corporations pursue alternative avoidance strategies extending from naïve (e.g., deferral strategies) to ultra-aggressive (e.g., tax shelters) positons for obvious real (i.e. cash) and/or financial benefits. Examining cross-sectional differences among firms, recent evidence documents a positive link between tax avoidance and firm value for firms with better corporate governance (e.g., Desai and Dharmapala, 2009, Wilson, 2009; Goh et al., 2016), income-mobility (DeSimone and Stomberg, 2012) and financial constraints (Ayers et al., 2011). On the other hand, every tax avoidance strategy comes with anticipated risks and in theory firms pursue a given tax strategy only when benefits to do so exceeds its' costs (e.g., Blouin, 2014, Scholes et al., 2008). For example benign strategies involving tax-exempt investments (e.g., municipal bonds) possess arguably no tax-positional uncertainty whereas ultimately aggressive active tax shelter participation will (e.g., Hanlon and Slemrod, 2009). Tax risk, although lacking clear empirical verification (Blouin, 2014; Guenther, Matsunaga and Williams, 2016), can effect contracting costs of tax avoidance in (at least) two complementary routes.

First, depending on the overall tax aggressiveness, tax avoidance might subject firms to escalated regulatory scrutiny. Tackling corporate tax avoidance has never been a more important objective for regulators and governments both in the U.S. and around the world. Corporations face rigorous domestic and international regulatory (Desai, Dyck and Zingales, 2007; Hoopes, Mescall and Pittman, 2012; Bozanic et al., 2016; Lennox et al., 2015; Kubick et al., 2016) and public attention (Dyreng et al., 2016; Chen et al., 2015) on their tax strategies. In the U.S., FASB implemented FIN 48 in 2006 and Schedule UTP in 2010 that require firms to estimate, report and detail relevant information on uncertain tax positions.[8] Similarly, in the international arena the OECD's project on Base Erosion and Profit Shifting (OECD, 2013) provides 15 action plans that aims to

[8] FASB has plans to further enhance information processed in tax accounts. (see http://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1176168335332&acceptedDisclaimer=true)

increase transparency in tax reporting and transactions to align corporate profits with jurisdictional economic value creation. Altogether, tax risk and tax-risk management have become a boardroom subject (KPMG, 2004; Donohoe, McGill and Outslay, 2014) where firms agree on increasingly greater tax specific risks related to stricter compliance terms and tax audits (E&Y, 2014).

Second, tax avoidance can decrease corporate transparency (Balakrishnan et al., 2011), facilitate managerial rent diversion (Desai and Dharmapala, 2006, 2009) and is generally illustrated with more aggressive financial reporting (Frank et al., 2009). All of these factors increase agency frictions between borrowers and lenders. For example, past research shows that banks value decision-useful timely accounting information (e.g., Watts, 2003; Ahmed et al., 2000; Ball, Bushman and Vasvari, 2008; Beatty, Weber and Yu, 2008) where firms are more conservative in anticipating profits in comparison to anticipating losses. Moreover, the complex nature of tax accounting and inconsistent disclosure of tax-specific information (e.g., Plumlee, 2003; De Simone and Stomberg, 2012; Robinson and Schmidt, 2013; Kim, Schmidt and Wetland, 2015) further increase information asymmetries between borrowers and creditors with regards to tax-specific risks undertaken.

At the intersection of the above discussion lies the fact that, unlike equity holders, banks do have asymmetric claims on firm performance in that while they have limited participation in future residual income, they bear significant downside risks (e.g., Shevlin et al., 2013; Hasan et al., 2014). Therefore, regardless of their real and/or financial benefits creditors are likely to focus more on inherent risks associated with different levels and forms of tax avoidance. Accordingly, banks "price-protect" their exposure to a given firm by pricing in additional premiums for bearing an incremental risks related to tax avoidance. My first hypothesis argues that;

H1: Banks require additional premiums to compensate for inherent risks in alternative forms and levels of tax avoidance.

Past research documents a positive link between micro and macro-level financial constraints and tax avoidance (Law and Mills, 2015; Edwards et al., 2016). These firms particularly rely on deferral strategies which provide a vital source of liquidity when most needed (Edwards et al., 2016; Ayers et al., 2011). Moreover, these strategies appear to enhance shareholder value particularly for financially constrained firms (Ayers et al., 2011). On the other hand, deferral-based strategies are short-term in nature where alternative strategies are likely to be constantly substituted. Although there exists a large pool of deferral-based tax avoidance options (Ayers et al. 2011) these strategies are likely to increase variability in cash tax payments which are negatively priced in by equity investors (e.g., Hutchens and Rego, 2015; Guenther et al., 2016). If some of these positions include more

aggressive interpretation of the tax code and are successfully challenged by the IRS, resulting tax settlements could substantially reduce internal cash flows at times when they are vital source of working capital. For example, Hasan et al., (2014) provides anecdotal evidence on a number of credit rating downgrades that cites large cash outflows due to IRS tax settlements as the primary underlying (see p.113). Such an impact on cash flows are particularly risky for financially constrained firms given that these firms future financing and investment strategies are particularly sensitive to the availability of internally generated cash flows (e.g., Fazzari, Hubbard and Petersen, 1988; Almeida, Campello and Weisbach, 2004; Campello et al., 2011). Therefore, I expect financially constrained firms to face greater contracting costs as a results of tax-specific risks in comparison to non-constrained firms. Similarly, information asymmetries directly affect firms' ability to borrow (e.g., Biddle and Hillary, 2006), the lender choice (e.g., Ongena and Smith, 2001) and price and non-price terms of loans (e.g., Bharath et al., 2008). Moreover, corporate tax avoidance can further facilitate managerial risk shifting and less transparent financial reporting environment for these firms (Desai and Dharmapala, 2006, 2009; Balakrishnan et al., 2011). In fact, recent evidence shows that even equity investors hold a negative perception of tax avoidance for informationally opaque firms (Goh et al., 2016). In the light of these observations I expect creditors to require greater risk premiums for tax avoidance for informationally opaque firms. Accordingly the second hypothesis argues;

H2: Firms with financial constraints and informational asymmetries face greater contracting costs as a results of their tax avoidance activities.

2.2. Syndicated Loan Markets and Risk Mitigation

Syndicated loans are financing arrangements provided by a syndicate (group) of lenders and incorporate a number of risk mitigation mechanisms available to lenders that are not, in most cases, accessible via single bank and/or arms' length financing. Syndicates are usually underwritten by large/senior banks with strong lending relations and capability to originate a loan deal who then allocate the loan proceedings to interested loan participants (Altunbas, Gadanecz and Kara, 2006). Accordingly, syndication allows lead agents to spread credit commitment among participating lenders and diversify their individual exposure to a single borrower and/or industry (e.g., Simon, 1993; BIS, 2003; Armstrong, 2003; Mora, 2015). The ability to allocate loan amounts among other lenders allows syndicate arrangers (usually large banks) to provide existing and/or new customers access to sizeable credit facilities that would otherwise exceed a single lender's regulatory capital limits (e.g., Simon, 1993; Armstrong, 2003; Mora, 2015).

On the other hand, contracting relations between borrowers and lenders are subject to informational frictions. These agency issues arise when lenders cannot credibly verify borrowers' expected future performance and when managers have incentives to divert corporate wealth from lenders to shareholders, respectively (e.g., Asquith et al., 2005). Syndicate arrangers can form efficient ownership structures to tackle these frictions between borrowers and lenders which directly contribute to adverse selection and moral hazard problems between lead and non-lead syndicate participants.[9] Moreover, amidst the intense competition for lending business syndicate leads are increasingly formed by a large group of credible banks that share underwriting, monitoring and administering responsibilities of loans – a strategy that also alleviates information asymmetries among the loan participants regarding the credibility of the borrower in question. This definitive trend in syndicate formation is an indication of banks' co-operation to take appropriate risks to more effectively compete with public debt markets for corporate lending business (e.g., Armstorng, 2003; Altunbas, Kara Marques-Ibanez, 2009). For example, while 57 percent of the total loans made in 1994 have a single lead agent underwriting loans, only 17 percent of the loans are formed by a single lead agent in 2016 in total un-adjusted Thomson Deals database.[10] These large banks charge significant upfront fees for underwriting, administration and monitoring of the loans (Dennis and Mullineaux, 2000) and are likely to commit to rigorous and ongoing monitoring. Given that corporate tax avoidance is inherently risky and potentially elevates adverse selection and moral hazard problems (see Section 2.1), I expect risk-mitigating syndicate formation structures to alleviate ex-ante risks inherent in alternative levels and forms of tax avoidance.

H3: Syndicate structures that facilitate credit risk sharing and alleviate information frictions among the lending parties will moderate some or all of contracting costs associated with alternative levels and forms of tax avoidance.

Moreover, the pricing of syndicate loans has become increasingly flexible with the development of performance pricing provisions (PPPs) as hybrid screening/monitoring mechanisms that utilize price and non-price terms simultaneously (Ball et al. 2008). PPPs are pricing grids that index the interest rate charged to a borrower's performance either measured using credit ratings and/or accounting-based financial information. These provisions

[9] Adverse selection, among the syndicate participants, occurs when the syndicate lead has privileged and private information as to the borrowers' "true" creditworthiness that is not "efficiently" shared with the non-agent loan participants (Mora, 2015). This opportunistic behavior, however, has found no empirical support so far (Simons, 1993; Jones et al., 2005; Lee and Mullineaux, 2004; Panyagometh and Roberts, 2010; Pichler and Wilhelm, 2001; Sufi, 2007; Chaudhry and Kleimeier, 2013). Given that banks earn up to 200BPS of the total loan proceeds in underwriting fees and compete with public debt markets for corporate lending business this behavior proves to be too costly in practice.

[10] I provide more detailed discussion on this topic in section 4.1. Descriptive Statistics

automatically increase/(decrease) loan spreads if a borrower's performance improves/(deteriorates) beyond/(below) pre-defined thresholds which increases administrative and monitoring flexibility for the syndicate agents. For example, Asquith et al. (2005) documents that PPPs effectively alleviate adverse selection and moral hazard problems between borrowers and lenders and that inclusion of interest-increasing performance provisions reduce loan spreads. Moreover, Manso et al. (2010) show that firms that choose loans with performance pricing provisions are more likely to improve their credit ratings compared to firms choosing fix-rate loans. Accordingly, by providing ex-ante disciplinary incentives, PPPs provide fair allocation of risk premium should the borrower performance improves and prevents costly pre-payment and resultant refinancing risks (Asquith et al., 2005). Given contractual effectiveness in mitigating borrower-lender frictions I expect performance pricing provisions to alleviate ex-ante risks inherent in alternative levels and forms of tax avoidance.[11]

H4: Syndicate loans with performance pricing provisions will mitigate some or all of adverse selection and moral hazard problems associated with alternative levels and forms of tax avoidance.

2.3. Alleviation of Information Asymmetries via Public Bond Markets

Firms have multi-tiered capital structures utilizing both relationship-led bank financing and arms' length public debt markets (Rauh and Sufi, 2010). A large and comprehensive literature links this observation to a number of supply and demand-side mechanism that govern firms' ability to access alternative borrowing sources. For example, bank-led financing adds the greatest value to small, young and riskier firms with substantial information asymmetries and in turn, bank financing seems to be the ultimate resort for this same group of firms (e.g., Diamond, 1984, 1989, 1991; Ramakrishnan and Thakor, 1984; Chemmanur and Fulghieri, 1994; Petersen and Rajan, 1994; Cantillo and Wright, 2000; Lin et al., 2013). Banks have the expertise to acquire and process specialized information regarding expected future performance and credibility of borrowers with weakly verifiable information (e.g., Diamond, 1991, Fama, 1985, James, 1987; Gilson John and Wang, 1990; Rajan and Winton, 1995; Boot, 2000; Bharath et al., 2008). Commensurate with the borrowing firm's risk profile, banks offer less rigid funding arrangements that are easier to re-negotiate in comparison to the contractual terms observed in public debt financing. For example, Roberts and Sufi (2009a) documents that banks frequently re-negotiate loan terms with borrowers depending on the arrival of new information concerning firms' credit quality,

[11] Asquith et al. (2015) distinguish between interest-increasing and interest-decreasing performance provisions. I do not make such distinction for the purposes of this study for two reasons. First, unlike Asquith et al. (2005), I am not interested in identifying determinants of these provisions. Second, as Asquith et al. (2005) also documents, both interest increasing and decreasing performance clauses are effective at mitigating adverse selections risks.

investment opportunities and macroeconomic fluctuations. This contractual flexibility, however, necessitates continuous acquisition of specialized information regarding expected future performance and credibility of the borrower in question (Diamond, 1991, Fama, 1985, James, 1987; Rajan and Winton, 1995) and monitoring via application of strict covenant clauses that are much more comprehensive than those observed in public debt markets (e.g., Gilson and Warner, 1997; Begley and Freeman, 2004; Kwan and Carleton, 2010). For example, examining 3720 private credit agreements in the U.S. Nini et al. (2009) show that 32% of the contracts contain an explicit restriction on capital expenditures.

Although these covenant clauses are successful at alleviating adverse selection and moral hazard problems associated with low-credit quality firms with significant information asymmetries (e.g., Diamond, 1984, 1989, 1991; Ramakrishnan and Thakor, 1984; Berlin and Mester, 1992), the benefits of such clauses do not equally extent to established firms with high credit quality and low information asymmetries (e.g., Diamond, 1989, 1991; Berlin and Mester, 1992; Houston and James, 2002; Denis and Mihov, 2003). For example, Diamond (1989) argues that as firms build their reputational capital they upgrade from bank-led financing to arm's length financing. Supporting this argument, empirical evidence documents that once firms acquire certain level of financial and reputational credibility they value public debt with less invasive covenant terms over traditional bank financing (e.g., Datta et al. 1999; Cantillo and Wright, 2000; Faulkender and Petersen, 2006; Colla, Ippolito and Li, 2010; Lin et al., 2013). Therefore, empirical evidence overwhelmingly supports supply-driven factors influencing firms' ability to access to additional non-bank financing and that credit constrained and informationally opaque firms are more likely to be cut-off from these public financing alternatives (e.g., Denis and Mihov, 2003, Faulkender and Petersen, 2006). For example, Faulkender and Petersen (2006) finds that firms that have access to public debt markets have, on average, 35 percent more debt than firms that do not. Similarly, Denis and Mihov (2003) show that the primary determinant of firm's access to public debt markets is the credit quality of the borrower. In line with these arguments the same firm characteristics that make firms bank-dependent also increase costs of non-bank external financing (Houston and James, 2001). For example, evidence argues on economies of scale to public debt financing and shows that it is only cost-effective to issue public debt if loan size exceeds $100 million (Carey et al., 1993; Krishnaswami, Spindt and Subramanian, 1999). Accordingly, given the significant economies of scale in public debt financing firms with large financing needs are likely to find it more cost-efficient to borrow in public markets compared to bank financing (Houston and James, 2001).

Moreover, firms may also tap into public debt markets to alleviate hold-up problems associated with relationship lending (Rajan, 1992; Houston and James, 1996) and gain relative bargaining power in re-negotiation terms should

the existing contract terms become sub-optimal with the arrival of new positive information regarding future firm performance (Rajan, 1992). Supporting this argument, Hale and Santos (2009) show that first time access to public bond markets reveals new information on firms' financial strength to public debt markets. This set of information arise from additional documents filed for SEC registration, information released via underwriters as part of their placement efforts, credit ratings assigned by rating agencies and the expert analysis from bond analysts and investors. For example, Moody's and S&P both have the policy to rate public bond issuers whether or not they have a particular rating agreement with the issuing firm. The authors show that following their first public bond issue, priori bank-dependent firms are able to obtain up to 50BPS lower interest rates as the existing bank now faces increased competition from public debt markets and priori un-informed banks.[12] Similarly, Santos and Winton (2008) and Ioannidou and Ongena (2010) show that recent public debt market access decreases bank loan spreads by 95BPS and 87BPS, respectively. Moreover, Santos and Winton (2008) document that banks with exploitable information over bank-dependent firms increase their loan rates to these firms during recession times by more than is justified by the borrowers' risk alone. In fact, the authors show that banks raise their loan rates (by 28BPS) only for these bank-dependent firms and not for firms with access to public debt markets. The analysis in Ioannidou and Ongena (2010) reveals that under competitive corporate lending environment banks systematically form information monopolies following the initiation of new lending relationship. All these aspects of relationship lending indicate that firms have sensible reasons to diversify-away form single lending structures once they acquire certain level of reputation capital.

These observations suggest two inter-connected channels through which firms are able to optimize their contracting costs. First, via information-dissemination channel (Santos and Winton, 2008; Hale and Santos, 2009; Ioannidou and Ongena, 2010) firms are able to eliminate hold-up costs related to bank financing and reduce loan spreads related to informational monopolies. This argument generally supports the evidence in Bharath et al. (2008) who documents greater accounting-based information quality for firms that borrow from public debt markets. Second, once firms enter public debt markets they are likely to utilize these markets even after their financial attributes fall below the original entry threshold (Cantillo and Wright, 2000). Therefore, the ability to access to public debt markets generates long-lasting financial flexibility through which firms can effectively choose between public vs bank financing depending on industry and/or market specific conditions (James and

[12] In a similar analysis Schenone (2010) use public equity IPO as an information shock that erodes existing bank's informational monopoly and confirms the argument that banks do price their informational monopolies for bank-dependent firms (Rajan, 1992).

Smith, 2000). In the light of the above discussion, I classify firms with simultaneous access to both public and syndicate loan markets as firms with the *"acquired credibility"* which reflects, in retrospective thinking, greater firm-level financial flexibility and information quality.[13] Accordingly, I make the following hypothesis:

H5: *"Acquired credibility"* via simultaneous access to both public and private debt financing will mitigate some or all of adverse selection and moral hazard problems associated with alternative levels and forms of tax avoidance.

Unlike bank financing public debt markets are not organized to screen and monitor issuers through non-price terms and heavily rely on price terms to factor in additional risk premiums (e.g., Bharath et al., 2008). Hence, I expect price-specific contracting costs of tax avoidance to be larger in public debt markets compared to syndicated loan markets particularly for high-yield, unsecured subordinate issues.

H6: Investors in public debt markets require greater risk premium for ex-ante expected risks related to tax avoidance compared to bank loan financing, in particular for high-yield speculative issues.

3. RESEARCH DESIGN AND SAMPLE SELECTION

3.1. Measures of Tax Avoidance

Corporations have a pool of avoidance strategies to manage their overall tax burden ranging from the least to the most aggressive (Hanlon and Heitzman, 2010). Therefore, I use tax avoidance proxies that broadly capture alternative forms of tax planning strategies with different ex-ante risk profiles (e.g., Scholes et al., 2009; Blouin, 2014). These include cash ETRs (CETR), book-tax differences (BTD), permanent book-tax differences (PBTD) and discretionary permanent strategies (DTAX). Cash ETRs, calculated as world-wide cash taxes paid (Compustat: TXPD) divided by pre-tax income (Compustat: PI) adjusted for special items (Compustat: SPI), captures the effects of deferral as well as permanent tax avoidance strategies. This measure reflects both certain (e.g., municipal bond interest) and uncertain tax positions (e.g., tax shelters), and is arguably the most direct measure of corporate tax burden (Edwards et al., 2016). Book-tax differences (BTD), calculated as the difference between book income adjusted for special items and taxable income scaled by total assets, which also capture both permanent and temporary book-tax differences. Permanent book-tax differences (PBTD),

[13] For the purposes of this study, the term "acquired credibility" is retrospective in thinking, given that I limit the sample to profitable firms alone, and do not aim to test forward looking interaction between contracting costs of tax avoidance and capital structure theories.

calculated as the difference between book-tax differences and temporary book tax differences, and captures permanent portion of the book-tax differences. I use these two book-tax differnce measures as both have significantly increased over the last decade (Gartner, Laplante and Lynch (2016), which is likely to explain declining trends in cash ETRs (Dyreng, Hanlon, Maydew and Thornock, 2015) and complement each other in identifying overall levels of tax aggressiveness (e.g., Goh et al., 2016). Finally, I use discretionary tax avoidance (DTAX) measure which reflects the discretionary portion permanent book-tax differences (Frank et al., 2009) to capture relatively more aggressive and potentially riskier end of tax avoidance strategies (Frank et al., 2009; Wilson, 2009; McGuire, Omer and Wang, 2012). All ETR measures are truncated in [0,1] intervals in line with the literature (e.g., Dyreng et al, 2008; Dyreng et al, 2014).

3.2. Measures of Financial Constraints and Information Asymmetries

In line with many studies (e.g., Faulkender and Petersen, 2006; Edwards et al., 2016) I use firms' credit ratings as the primary measure of financial constraints. I limit my analysis to credit ratings-based financial constraints for two sound reasons. First, the study excludes loss-making firm-years in order to meaningfully interpret firm-level tax aggressiveness. Second the bond market data available via Thomson Deals database is only the fraction of non-financial firms available in the Compustat universe. Therefore, my sample would fail to capture complete implications of model-based measures of financial constraints such as KZ Index as in (Lamont, Polk and Saaá-Requejo, 2001) or WV Index as in (Whited and Wu, 2006). I use two alternative criteria that determines firm-level financial constraints. First, I categorize firms as financially constrained if they are not assigned investment-grade credit rating. Second I assign firms as financially constrained if they are not assigned any credit rating at all. Finally, I use issue-level financial constraints where issues with no and/or non-investment grade rating are categorized as issues from firms with financial restrictions. For the brevity of the study only the results for the firm-level financial constraints defined as firms with no investment-grade credit ratings.

Next, I construct an industry-year adjusted composite measure to control for firm-level informational asymmetries. I use institutional ownership, the number of analysts following, accrual quality and the ability to access public debt markets as inputs into this measure. Institutional ownership and analyst coverage function as effective external governance mechanisms (e.g., Burns, Kedia and Lipson, 2010; Chung and Zhang, 2011; Chen, Harford and Lin, 2015) and are associated with increased firm-level information environment (e.g., Jiambalvo, Rajgopal and Venkatachalam, 2002; Roulstone, 2003; Velury and Jenkins, 2006) and lower cost of capital (e.g., Bhojraj and Sengupta, 2003; Ashbaugh, Collins, and LaFond, 2006; Bowen, Chen and Cheng, 2008). Next, I add accrual quality measure augmented by Francis et al (2005) based on Dechow and Dichev (2002) model.

Given that accrual-based earnings better reflect future operating cash flows (e.g., Dechow, Kothari and Watts, 1998), this measure is a reasonable proxy for earnings quality and is shown to effect cost of capital (Francis et al., 2005; Kim and Qi, 2010). Finally, I add a dummy indicator for firms with simultaneous access to public bond markets which reflects greater firm-level information dissemination to new investors and priori un-informed competitor banks (see discussion in section 2.3). I estimate five-year averages for institutional ownership, the number of analysts following and the accrual quality measures for both firm and industry-years. I estimate industry-adjusted values for each variable by taking the difference between firm and industry averages for each variable. I then partition all these three measures into their deciles and scale the values to be in [0,1] intervals as in Shevlin et al (2013). I estimate the composite measure of information asymmetries as the average of institutional ownership, the number of analysts following, accrual quality and public bond holding indicator (BOND) where firms with/(with no) access to bond markets receive a value of 0/1.

3.3. Composite Measure of Syndicate-Level Risk Management

Given that a typical loan issue might include all forms of risk mitigating factors, controlling for the simultaneous effects of all risk mitigating mechanisms would require multiple-way interaction analysis. To circumvent around such an empirical challenge I generate a composite measure that controls for the availability of syndicate-level risk mitigation mechanisms. To do so, I first rank total number of lead banks/agents, loan participants, reputable lead arrangers and the proportion of syndicate-lead loan ownership into their respective quintiles. Next, I scale the quintiles to be in [0,4] interval and calculate an overall risk-mitigation score by summing the values of each risk mitigating factor. To this measure I add 4 if the firm has performance pricing provisions embedded in loan terms and 0 otherwise. Finally, I re-rank this preliminary score into its quintiles and identify observations in the top quintile as issues with the most comprehensive risk mitigating mechanisms accessible. Accordingly, the dummy indicator CRM takes the value of 1/(0) if the measure is at the top quintile/(otherwise) and reflects loans with the most comprehensive risk mitigation mechanism available. The estimation procedure follows similar steps as in the income mobility measure used in De Simone, Mills and Stomberg (2015).

3.4. Empirical Modelling

I use the following baseline model to test contracting costs associated with tax avoidance

$$\begin{aligned} SPREAD_{i,t} = {} & TAX_{i,t} + NLD_{i,t} + NOPART_{i,t} + PPP_{i,t} + LEADPCT_{i,t} + LREP_{i,t} + TERM_{i,t} + REVD_{i,t} \\ & + SECUR_{i,t} + LNLOAN_{i,t} + LNTA_{i,t} + PTROA_{i,t} + LVRG_{i,t} + PIFO_{i,t} + AQ_{i,t} + PPE_{i,t} \\ & + MTB_{i,t} + INOWN_{i,t} + ANFLW_{i,t} + CIS_t + T + IND \end{aligned} \quad (1)$$

In the above model SPREAD is the loan spread required by banks. TAX represents all four alternative tax avoidance proxies used in the analysis including CETR, BTD, PBTD and DTAX. NLD is the dummy indicator which takes the value 1/(0) if the loan facility has greater/(less) than median number of lead arrangers and controls for syndicate-lead-level risk diversification. NOPART is the total number of participants in a syndicate loan. On average, these ownership structures to alleviate information asymmetries among the lending group (Asquith et al., 2005; Manso et al., 2010) and between lenders and borrowers (Jensen and Meckling, 1976). Hence, I expect to receive negative coefficients for these two variables. PPP is the dummy indicator for loans that include performance pricing provisions. COV is the number of covenants included in a loan. I expect both covenant based non-price terms and PPPs to alleviate adverse selection and moral hazard problems associated with bank financing and observe negative coefficients for these variables.

In addition to the number of lead arrangers in a syndicate, in line with the literature (e.g., Sufi, 2007, Mora et al., 2015), I control for the proportion of loan held by the syndicate arrangers (LEADPCT). Unlike the past research (e.g., Sufi, 2007), however, I am not interested in capturing individual lead-bank level loan ownership but rather focus on the total portion of loan held by the lead agents altogether. Therefore, if four lead arrangers hold half of the total loan amount altogether that is the ratio I use in LEADPCT and not 12.5 percent (50%/4) for each lead bank. Priori, I expect to observe negative coefficients for the total lead-bank ownership variable. I control for lead arranger reputation as an additional variable that mitigates agency conflicts among the lending group as in the past research (Denis and Mullineaux, 2000, Sufi, 2007; Ball et al., 2008; Chaudhry and Kleimeier, 2013). Specifically, I classify top five syndicate arrangers per given year in Thomson Deals database as the most reputable lenders. Next, I identify loans with the number of reputable lenders in the top quartile of the total sample distribution (LREP). I expect to see negative coefficients for this variable and average loan spread spreads. Finally, in line with the past research (e.g., Sufi, 2007; Hasan et al., 2014; Shevlin et al., 2013) I control for average loan maturity (TERM) and average loan size as the natural logarithm of the loan amount (LNLOAN). I control for the difference between commitment loans and term loans (e.g., Berger and Udell, 1995) and add a dummy indicator (REVD) that takes the value of 1 if the loan is a revolving credit facility and 0 otherwise. Finally, I also control for whether the loan is a revolving credit facility (REVD) and secured via collateral (SECUR) as loan level control variables (e.g., Sufi, 2007; Hasan et al., 2014; Shevlin et al., 2013).

Next, I include commonly-used firm level control variables. I control for firms size (LNTA) as the natural logarithm of total assets (Compustat: at) and financial leverage (LVRG) as the total long term debt outstanding (Compustat: dltt) divided by total assets. I control for firm-level profitability using total and foreign pre-tax

returns on assets (PTROA, PIFO) calculated as pre-tax income (Compustat: pi) and foreign pre-tax income (Compustat: pifo) divided by total assets, respectively. I control for the accrual quality (AQ) as calculated in Francis et al (2005) as a proxy for earnings quality, percentage of institutional ownership (INOWN) and the number of analysts following (ANFLW) as measures of external corporate governance. I expect to see a positive link between low quality earnings and loan spreads (e.g., Cook et al., 2015). Moreover, I expect stronger external governance to alleviate borrower-lender frictions and hence observe negative coefficients for these variables (e.g., Bhojraj and Sengupta, 2003; Ashbaugh et al., 2006). I use net property, plant and equipment (Compustat: PPENT) scaled by total assets to control for asset tangibility. Finance literature argues that assets that are more tangible mitigate contractibility problems between borrowers and lenders and enable access to larger funding facilities (e.g., Harris and Raviv, 1991; Rajan and Zingales, 1995; Campello and Giambona, 2010). Therefore, I expect a negative link between asset tangibility (PPE) and loan spreads. I control for the availability of firm-level growth opportunities using market-to-book ratio (MTB) and the effects for macro-level financial constraints using commercial and industrial spread (C&I spread) over federal fund rates (CIS) as in Harford et al. (2014). Specifically, CIS takes the value of 1/(0) when the C&I spread over the federal fund rates greater than median/(otherwise). I expect to see macro-level financial constraints to be priced in bank loan spreads.

Next, I augment the baseline model and incorporate interaction variables that tests for the effectiveness of syndicate-level risk mitigating mechanisms and "acquired credibility" via simultaneous access to public and bank financing in moderating tax-specific risks priced as additional spreads in bank loans. Specifically, I interact the dummy indicator NLD and performance pricing provisions (PPP) with alternative tax avoidance strategies. These interaction variables (i.e. NLDTAX and PPPTAX) control for the moderating effects, if any, of syndicate-level risk mitigation mechanisms on ex-ante risks related with alternative tax avoidance strategies.[14] Next, I control for the effectiveness of covenant-based monitoring on moderating ex-ante anticipated risks related to tax avoidance. I add a dummy indicator (COV) for issues that has at least one restrictive covenants and its interaction with tax avoidance measures (COVTAX). The interaction variable COVTAX controls for the role covenants play in alleviating tax-specific agency costs of bank financing.[15] Finally, I add a dummy indicator

[14] In un-tabulated analysis I also include interaction dummies to test for the tax-risk moderating effects, if any, for total syndicate participation (NOPART), lead arranger reputation (LREP) and syndicate-lead loan ownership ratio (LEADPCT).

[15] In un-tabulated analysis I test for the same argument by including a dummy indicator that takes the value of one if the number of restrictive covenants in a given loan facility is at the top quartile of the sample distribution and zero otherwise.

controlling for firms' access to public debt market (BOND) and its interaction with alternative measures for tax avoidance (BONDTAX). This interaction variable controls for "*acquired credibility*" which reflects greater firm-level information environment and financial flexibility.

Finally I further augment the baseline model to examine the contracting costs of tax avoidance for public debt markets. In addition to all test and control variables available for public bond market sample, I use high-yield bond indicator dummy (HYB) and its interaction with alternative proxies for tax avoidance (HYBTAX) to control for additional risks premiums bond investors may demand for bearing ex-ante risks inherent in alternative tax avoidance strategies.

3.3. Sample Construction

The data for syndicated and public debt financing is obtained from Thomson One Deals database which offers the same coverage as SDC Platinum, database that is widely used in empirical research. Syndicated loans data obtained from this database is then matched to Compustat database to obtain relevant financial information. I follow past research in tax literature (e.g., Dyreng et al., 2008; Drake et al., 2015) and eliminate financial and utility firms (SIC: 6000-6999, SIC: 4900-4999), firms that are domiciled outside of the U.S. (Compustat: FINC=0) and loss-making firm year observations. Moreover, I truncate cash ETR data to be in [0,1] interval and exclude firm-years with average asset size less than $10MN as IRS view these firms as small corporations. Finally, as in Dyreng et al. (2008), I drop firms with less than 10 years of observations. Altogether, this sample selection criteria results in maximum of 6456 loan-year observations and varies with alternative tax avoidance strategies and or sample specifications investigated. As in Hasan et al. (2014) the analysis focuses on loan facility per year.

4. RESULTS

4.1. Descriptive Statistics

Table 1 presents descriptive statistics for all the variables used in the study. The median cash ETR is 26% and is in accord with the levels observed in previous studies (e.g., De Simone and Stomberg, 2012). This rate is much lower than the U.S. statutory 35% and indicates that, on average, firms are successfully utilizing strategies to alleviate their overall tax burden. Examining the time-series movements in cash ETRs (graph A), total and permanent BTDs (graphs B, C) and DTAX measures (graph D) in Figure 1, one can apprehend the reason why corporate tax affairs have been going under immense regulatory scrutiny.

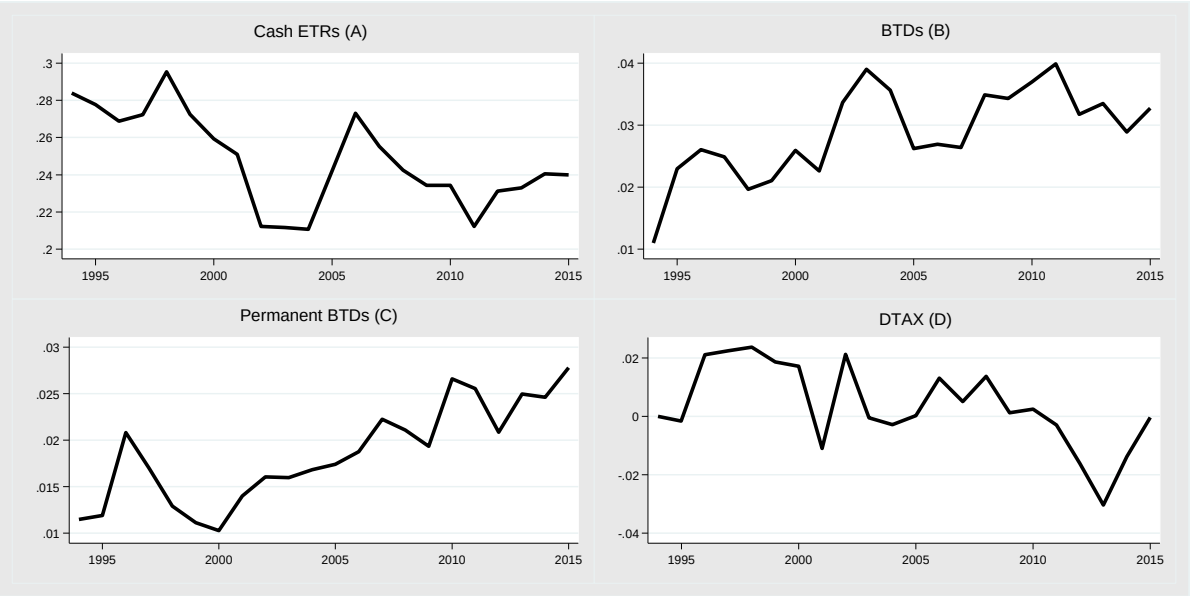

Figure 1: Time-series Depiction of Alternative Tax Measures

For example, graph (A) shows that cash ETRs have been consistently decreasing over the last 22 sample-years examined. In univariate terms sample cash ETRs average at 24% in the year 2015 which is 4.4% lower in comparison to 28.4% CETRs observed in 1994. This decrease in CETRs is comparable, in economic terms, to 5% drop in cash ETRs observed in Dyreng et al. (2016) for a slightly larger sample period of 25 years. Moreover, both total (BTD) and permanent (PBTD) book-tax differences have systematically been increasing over the same period indicating that firms have been utilizing both permanent and temporary avoidance strategies simultaneously. Firms' reliance on relatively more aggressive discretionary permanent strategies has been steadily declining since the early 2000s. One could argue that intensified public and regulatory attention over the most tax-aggressive firms might have curbed corporate demand for these aggressive strategies and facilitated a shift toward less aggressive "proven-to-work" strategies over time.

In univariate analysis the average number of lead arrangers is 3 banks/agents per syndicate loan and lead arrangers hold, on average, 45 percent of a typical loan provided. More important, however, is the time series observation that while there is a systematic and economically meaningful increase in average lead-level participation, there is an opposite trend for the lead ownership ratio. Figure 2 below depicts how syndicate formation is shaped in time series during the sample period. For example, lead ownership ratio (LEADPCT) in a given syndicate has been steadily decreasing since the early 2000s (see graph A). The average proportion of loans held by the lead syndicate was 61% in pre-2000 period whereas this ratio averaged at 35% in the post-2000 period. On the other hand, the size of the syndicate lead (NLD) in proportion to total syndicate participants (graph C) has been steadily increasing since the early 2000s. In addition, the proportion of the most reputable

lenders within a syndicate (relative to total syndicate size) has been steadily increasing over the years for a typical syndicated loan facility provided (see graph D). For example, while the number of lead agents in a given syndicate loan was 22% of the total number of loan participants in pre-2000 period, this ratio reached 45% in the post-2000 period for a typical loan provided. Moreover, these observations are, on average, free from the denominator effect since there has been no systematical change in total syndicate participation (graph B).

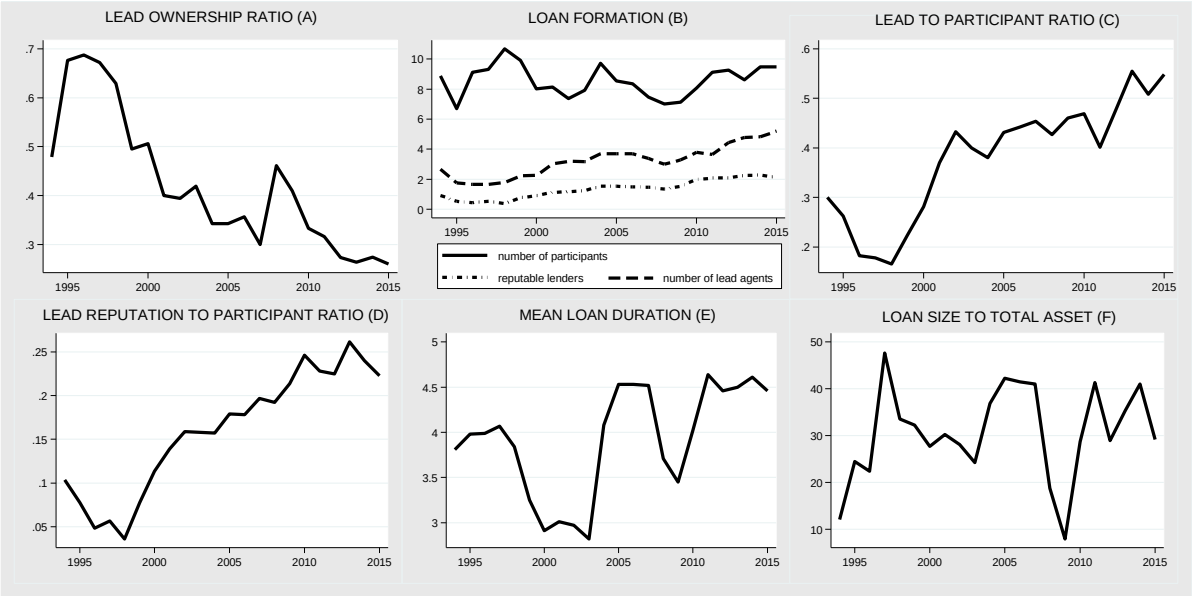

Figure 2: Time-series Depiction of the Syndicate Loan Market Properties

This systematic change in syndicate formation and ownership structure suggest that banks increasingly co-operate to compete against public debt markets in corporate lending business while at the same time optimizing their overall loan-portfolio risks. Moreover, this obvious trend in syndicate origination dynamics also suggests that lead banks and potentially borrowers are increasingly focusing on the quality of the lead-syndicate formation, including the number the most credible lenders, rather than loan ownership structure alone.

Loan spreads range from 50BPS in the low and 175BPS in the top quartiles but are significantly higher for firms with financial constraints and information asymmetries (un-tabulated). The mean loan size (LOANSIZE) is $739MN with an average 4 years of maturity (TERM). This amount is larger than Hasan et al. (2014) study given that I eliminate loss making observations which increase the relative skewness in the scale economies of the sample. While the loan size and maturity seems to accord with macroeconomic conditions, on average, both have been increasing in the post-2000 period (see graphs E and F). During this period banks syndicated substantially large loans to fund some sizeable acquisitions including Anheuser-Busch InBev's $75BN and Teva Pharmaceuticals's $30.5 financing packages (Reuters, 2015).

One can observe that, on average, spreads for public debt financing (SPREADB) are significantly larger than spreads observed for bank loans (SPREAD). This is not surprising given that public debt markets are not developed to conduct efficient monitoring based on non-price terms as in the case for relationship-specific financing. Therefore, investors in public debt markets focus more on pricing terms that reflects firm specific risks rather than non-pricing terms. The mean issue size (LOANSIZEB) is $1.3BN with an average maturity of 11 years (TERMB) in public debt markets which are expectedly larger than the average loan size and maturities observed for syndicated loan markets. Moreover, public debt financing, in line with the observable trend in syndicated financing, have increasingly been facilitated by larger group of underwriters (un-tabulated), which indicates that large players in this market also co-operate to more effectively compete with bank-financing for corporate lending business.

4.2. Baseline Results

Panel A in Table 2 runs the baseline model that tests contracting costs of tax avoidance. Concentrating the analysis on cash ETRs the coefficient 53.87 corresponds to 7.50BPS increase in loan spreads for a standard deviation (0.14) increase in tax avoidance. Given the mean loan amount of $739MN this tax avoidance premium corresponds to $554,250 ($739MN × 7.50BPS) additional interest cost per year. For an average four year loan in the sample, this corresponds to $2.22MN (4 × $554,250) in additional tax-related financing costs for an average borrower. On the other hand, coefficients for BTD and DTAX measures correspond to 4.33BPS and 2.86BPS increase in bank financing given a standard deviation increase in each of these measures. Baseline results for permanent BTDs are not statistically significant at conventional levels. These results provides preliminary evidence that banks direct their focus on cash ETRs as the most relevant measure of tax avoidance (Edwards et al., 2016). In particular, although perceived to reflect tax avoidance at the more aggressive-end (e.g., Congress Joint Committee on Taxation, 1999; Weisbach, 2002; Frank et al., 2009; Wilson, 2009; McGuire, Omer and Wang, 2012), banks do not seem to demand proportionately large risk premiums for avoidance strategies that alter GAAP earnings (i.e. PBTDs and DTAX). Further along the paper, I run cross-sectional analysis that controls for firm-level information asymmetries and financial constraints and test for contracting costs of alternative tax avoidance strategies.

The coefficients for NLD are negative and economically significant – indicating that, on average, loan facilities with larger syndicate-lead formation have lower loan spreads. In line with Asquith et al. (2005), the incorporation of performance pricing provisions (PPP) in loan terms is negatively linked to loan spreads. These baseline results show that, on average, these two risk mitigation mechanisms effectively reduce overall agency

frictions between borrowers and lenders and potentially those among the lending group itself. [16] In economic terms, a typical loan that incorporates larger syndicate-lead formation and performance pricing provisions is associated with around 13BPS and 40BPS lower loan spreads, respectively. The coefficients for the larger syndicate participation (NOPART) reduces loan spreads by 8.50BPS, a relatively modest magnitude in comparison to the levels observed for NLD. In line with the past evidence (e.g., Sufi, 2007; Altunbas et al., 2009), lead ownership (LEADPCT) and lead reputation (LREP) also effectively moderate information asymmetries associated with bank financing. In economic terms, a typical loan with larger syndicate-lead ownership and reputable syndicate arrangers offset 8BPS and 11BPS of the baseline loan spreads demanded.

The coefficients for the control variables are in line with the priori expectations. For example, anticipating solvency risks, results indicate larger spreads for firms with greater financial leverage. On the other hand, negative coefficients for the firm size (LNTA) suggest the benefits of scale economies in loan spreads. Moreover, both worldwide and foreign return on asset significantly reduce loan spreads. These results are important given that the majority of the U.S. multinationals do not have access to their foreign profits as most of these investments are declared as permanent under ASC 740. In line with the prior literature having larger institutional investor base and number of analysts following reduce loan spreads by 5BPS and 6BPS, respectively. These results show that both types of external governance measures are effective at alleviating overall borrower-lender frictions inherent in debt financing. In line with the existence of relationship-focused lending (e.g., Berger and Udell, 1995) I observe lower spreads for syndicate loans facilitated as revolving bank line of credits. Finally, macro-level financial constraints (CIS) are positively associated with loan premiums where a standard deviation increase in C&I spread translates into economically-meaningful 40BPS increase in loan spreads. Panel B replaces all risk mitigating mechanisms with composite risk mitigation measure (CRM). On average, for a typical firm having access to the most comprehensive set of loan terms that facilitates risk mitigation lowers loan spreads by 18BPS. The coefficients for the remaining control variables are similar to those observed in Panel A. Overall, the outcome of the baseline analysis supports the hypothesis (H1) that banks price in additional risk premiums to compensate for inherent risks in alternative forms and levels of tax avoidance.

[16] I also use a continuous variable that controls for the size of the syndicate-lead. I obtain qualitatively similar results for the baseline analysis.

4.3. The Effects of Financial Constraints on Contracting Costs of Tax Avoidance

Table 3 investigates the effects of firm-level financial constraints on contracting costs of tax avoidance. I classify firms as financially constrained if they do not have investment grade rating in a given year. Panel A and B use individual risk mitigation mechanisms available to a syndicate and Panel C and D use composite risk mitigation measure (CRM). Coefficients in Panel A which runs the baseline model on financially constrained sub-sample are significantly larger than those observed in Panel B. In fact, in the non-constrained sample (Panel B) none of the coefficients for TAX variable are statistically significant at conventional levels except for discretionary permanent strategies which results in 3.21BPS increase in loan spreads for a standard deviation change in the measure.[17] On the other hand, for financially constrained firms a standard deviation increase in cash ETRs, total and permanent BTDs results in 8.84BPS, 6.96BPS and 5.96BPS increase in loan spreads, respectively. Using the CRM measure of risk mitigation in Panel C and D validates the observations in Panel A and B. Specifically, I estimate 9.33BPS, 6.70BPS and 5.55BPS increase in loan spreads for a given standard deviation increase in CETR, BTD and PBTD measures for financially constrained firms (Panel C). These results provide preliminary support for the hypothesis (H2) that contracting costs of tax avoidance are aggravated for financially constrained firms.[18]

There are also non-tax related differences between financially constrained and non-constrained firms. For example, the intercept, which represent loan spreads banks charge independently of controlled set of firm characteristics (e.g., tax aggressive, highly leveraged) are significantly larger for firms with financial constraints. This observation is in accord with the theoretical and empirical arguments made in finance literature and confirms the validity of the financial constraints criteria utilized in the analysis. Moreover, all risk mitigation mechanisms, including the composite measure operates more effectively at alleviating agency costs related to debt financing for financially constrained firm-years in comparison to non-constrained firm-years. For example loans with larger syndicate leads receive, on average, 11BPS lower loan spreads than firms that do not. Similarly, larger number of performance pricing provisions reduce loan spreads by 40BPS, on average.

4.4. The Effects of Information Asymmetries on Contracting Costs of Tax Avoidance

[17] Note that I do not observe similar positive results for DTAX measure for non-constrained firms when I replace firm-level financial constraints measure with issue-level measures.

[18] Note that my interpretations remain both quantitatively and qualitatively very similar when the model identifies financially-constrained firm-years as non-rated firms at the firm level and/or non0investment grade rated at the issue level. For the brevity of the study I do not present the results of these alternative model specifications.

Table 4 examines contracting costs of tax avoidance under significant firm-level information asymmetries. The coefficients for the TAX variable are positive and statistically significant for all forms of tax avoidance strategies both in Panel A, which use all different forms of risk mitigating mechanisms, and in Panel B, which use the CRM substitute. For the low-information asymmetries sub-samples (Panel B and Panel C) CETRs and BTDs are positively linked to loan spreads albeit the magnitude of this link is smaller in comparison to those observed for firms with high-information asymmetries (Panel A and Panel C). On the other hand, I fail to find any statistically significant directional link between PBTDs and DTAX measures and bank loan spreads for firms with relatively low information asymmetries. These results confirm the arguments made in the second hypothesis (H2) and are in line with the evidence that links the interaction between tax avoidance and information asymmetries with aggravated firm risk and cost of capital (Shevlin et al., 2013; Goh et al., 2016). In line with the theoretical and empirical evidence in financial contracting literature (e.g., Faulkender and Petersen, 2006), I observe larger loan spreads, all else equal, for firms with high informational asymmetries in comparison to firms with low information asymmetries. As reflected in intercept terms, banks, on average, charge 66BPS larger spreads for firms with high information asymmetries. In addition, all of the risk mitigation mechanisms examined are more effective at moderating borrower-lender frictions for firms with high information asymmetries in comparison to firms with low information asymmetries.

4.5. The Effects of Risk Mitigation Mechanisms on Contracting Costs of Tax Avoidance

Table 5 examines the effects of risk mitigation mechanisms, if any, on the contracting costs of tax avoidance. Respectively, Panel A, B and C use dummy indicators to control for larger syndicate-lead formation (NLD), issues with performance pricing provisions (PPP) and the composite risk mitigation measure (CRM). The coefficients for TAX variable confirms previous results that banks price in additional premiums to compensate for ex-ante risks inherent in alternative forms and levels of tax avoidance. These additional risk premiums are largely mitigated for issues with larger number of lead agents (NLDTAX), for issues with performance pricing provisions (PPPTAX) and more complete set of risk mitigating mechanisms intact (CRMTAX). Based on the average for the coefficients in each panel, a standard deviation increase in cash ETRs results in 10.50BPS larger loan spreads. Moreover, focusing on the CETR measure, issues with larger syndicate-lead formation and with performance pricing provisions mitigate economically significant 44% and 72% of the additional risk premiums required for tax avoidance.

In un-tabulated analysis I also test whether lender reputation, larger syndicate participation and syndicate-lead ownership moderate the contracting costs associated with tax avoidance. Although each of these measures are

effective at moderating overall agency frictions related to tax avoidance in accord with the literature (e.g., Simon, 1993; Dennis and Mullineaux, 2000; Asquith et al., 2005), these effects do not, in some models, extent towards risks related to tax avoidance. In particular, these alternative risk mitigation mechanisms are not robust when the models control for the effects of larger syndicate lead formation and performance pricing provisions on contracting costs of tax avoidance.

These observations could reflect the systematic change in syndicate formation and ownership structure described in section 4.1. In time series, a typical syndicate loan includes increasingly larger number of large and credible lead arrangers that, on average, hold increasingly lower proportion of the outstanding loan amount. Therefore, banks seem to alleviate asymmetric information problems associated with syndicate-level credit risk sharing more so by focusing on the quality of the lead ownership rather than the proportion of the lead ownership (see Figure 2). This could be one way to evaluate statistically insignificant link between the proportion of lead bank ownership and contracting costs of tax avoidance. On the other hand, I fail to find evidence where the moderating effects of larger syndicate formation on contracting costs of tax avoidance are more pronounced and/or confined to the most reputable lenders (top 5 lenders per year). I acknowledge that my analysis may be subject to sample selection limitations as I exclude loss making-firm years and truncate CETR observations in [0,1] interval. Given the existence of sample restrictions and the fact that a typical loan can simultaneously provide lenders with each of these risk mitigating mechanisms, I use syndicate-lead formation (NLD, LREP), syndicate size (TPART) performance pricing provisions (PPP) and lead ownership ratio (LEADPCT) to estimate a composite measure of syndicate-level risk mitigation. The results in Panel C show that loans with more complete set of risk mitigating mechanisms (CRM) alleviate both general and tax-specific agency costs associated with bank financing. Focusing on CETR measure, the coefficient for CRMTAX indicate that having comprehensive access to all forms of risk mitigating mechanisms will eliminate 83% of the contracting costs of tax avoidance for a typical loan.

The difference between these panels is that tax-risk moderating effects of performance pricing provisions do not seem to extend beyond cash ETRs. While loans with larger syndicate leads significantly offset additional premiums required for CETRs, BTDs and PBTDs, CRM measure is effective at alleviating additional risk premiums for CETRs and BTDs. The coefficients for DTAX measure are mostly not significant at conventional levels except for that last column in Panel B. Although a standard deviation increase in DTAX results in 4.30BPS increase in loan spreads, loans with large performance pricing provisions more than offset this additional risk premium. Altogether, these results validates the arguments made in hypothesis 3 (H3).

Accordingly, larger syndicate-lead formation, which alleviates information asymmetries and facilitates credit risk sharing among the lending parties, moderates some or all of adverse selection and moral hazard problems associated with alternative levels and forms of tax avoidance. Similarly, results for PPPs provide general support for the arguments made in hypothesis 4 (H4) where syndicate loans with larger number of performance pricing provisions mitigate some or all of adverse selection and moral hazard problems associated with alternative levels and forms of tax avoidance.

4.6. Financial Constraints, Loan-Risk Mitigation and Contracting Costs of Tax Avoidance

Table 6 examines contracting costs of tax avoidance and the moderating effects of loan-specific risk-mitigating mechanisms for financially constrained firms. Panel A and B control for syndicate-lead size and performance pricing provisions and their interaction with alternative forms of tax avoidance. Panel C use the composite risk-mitigation measure. The coefficients for TAX variable confirms the observations in Table 3 in that contracting costs of tax avoidance, except for DTAX measure in Panel B, are confined to financially constrained firms. The economic substance of this positive link is significant. For a standard deviation increase in cash ETRs loan spreads increase by around 11BPS and 13BPS for financially constrained firms in Panel A and Panel B. Moreover, loan facilities with larger syndicate-leads or performance pricing provisions mitigate around 36% and 89% of the additional risk premiums required for tax avoidance. In Panel C the coefficients for the CETR corresponds to 11BPS increase in spreads for a given standard deviation increase in cash ETRs for financially constrained firms. Having access to a more complete set of risk mitigation mechanisms within a syndicate (CRMTAX) eliminates all of the additional risk premium required for tax avoidance. As in Table 3, the coefficients for intercepts indicate that, all else equal, baseline spreads for financially constrained firms are significantly larger than baseline spreads for non-constrained firms.

4.7. Information Asymmetries, Loan-Risk Mitigation and Contracting Costs of Tax Avoidance

Table 7 segregates the sample into high and low information asymmetries sub-samples and tests for contracting costs of tax avoidance and the moderating effects of loan-specific risk-mitigating mechanisms. The average intake form the coefficients in each panel is that banks demand larger risk premiums for aggressive levels of tax avoidance for firms with more severe information asymmetries. Focusing on cash ETRs a standard deviation increase in tax avoidance results in 11.80BPS/(10BPS) increase in loan spreads for firms with high/(low) information asymmetries. Similarly, loan spreads increase by 8.53BPS/(5.71BPS) for firms with high/(low) informational asymmetries for a standard deviation increase in book-tax differences. While I find no statistically significant link between loan spreads and PBTDs and DTAX measures for firms with low information

asymmetries these permanent-based strategies increase loan spreads by 9.27BPS and 4.30BPS (Panel B and Panel C) respectively for firms with high information asymmetries. Moreover, I find some evidence that syndicate-level risk mitigation mechanisms moderate additional risk premiums required for tax avoidance, particularly for the composite measure of risk mitigation proxy (Panel C). This moderation effect, however, is not as statistically strong as the evidence observed for financially constrained firms (Table 7) and do not, in general, extend towards permanent-based avoidance strategies (PBTDs and DTAX). On average, loan-specific risk mitigation mechanisms are more effective at alleviating general non-tax specific agency frictions between borrowers and lenders for firms with severe information asymmetries.

4.8 Controlling for Self-Selection in Syndicate-Level Risk Mitigation Mechanisms

Although lenders have the bargaining power to dictate both price and non-based loan terms, firms have the ultimate choice to accept these terms. Accordingly, some firms might be more flexible during loan negotiation and willing to accept and/or even initiate new terms (in addition to what banks already propose) that better align borrower and lender interests. In fact, in un-tabulated analysis I find no particular link between non-price terms and tax avoidance indicating that borrowers are more likely to self-select into loan facilities with alternative risk mitigating mechanisms for tax-specific reasons. To control for the plausible effects of self-selection into syndicate-level risk mitigation mechanisms, which aims to alleviate general borrower-lender frictions, I match firms based on their observable characteristics. Matching samples on common set of observations allows me to control for important differences among firms that could affect regression results. Accordingly, score-matching provides a degree of comfort in terms of extracting out a more genuine link between syndicate-level risk mitigating mechanisms and contracting costs of tax avoidance.[19]

Table 8 examines the effects of syndicate-level risk mitigation on contracting costs of tax avoidance for the full sample. Panel A and Panel B control for self-selection into loans with greater number of lead agents and performance pricing provisions, and Panel C uses composite measure of syndicate-level risk mitigation measure, respectively. Among the matched sample of observations for each panel I continue to observe a positive link between tax avoidance and loan spreads. More important, all risk mitigating measures effectively alleviate additional risk premiums required for both general and tax-specific agency costs of loan contracting. I find that

[19] The details of the matching procedure is provided in Appendix B for the brevity of the main text. Propensity score matching results reported in the main text are limited to models that control for the effects of syndicate-lead size and performance pricing provisions as matched sample evidence on other risk mitigating factors are not statistically different from non-matched analysis discussed earlier in the text.

the moderating effects for performance pricing provisions are confined to cash ETRs for the full sample analysis whereas the moderating effects of the syndicate lead size extends to total and permanent BTDs. CRM proxy for more complete set of syndicate risk mitigation also effectively mitigates additional tax-specific risk premiums required for cash ETRs and total BTDs.

Table 9 and 10 extends the analysis into firms with financial constraints and information asymmetries, respectively. In line with the results in Table 6, matched-sample results indicate that the positive link between tax avoidance and loan spreads is confined to firms with financial constraints. Similarly, the analysis in Table 10 validates that on average tax avoidance is linked with larger loan spreads for firms with severe financial information asymmetries. In both tables I continue to observe that all three risk mitigation mechanisms operate more effectively at alleviating both general and tax-specific agency costs associated with bank financing. On the other hand, I do not observe a statistically significant link between discretionary permanent tax avoidance and loan spreads in none of the analyses.[20] Overall, the results in this section validates the arguments made in hypotheses H1, H2, and H4.[21]

4.9. Access to Public Debt Markets and Contracting Costs of Tax Avoidance

In this section I examine contracting costs of tax avoidance controlling for corporate access to public debt market financing which enables firms to tap into longer-term financing options with more flexible covenant-terms. Panel A in Table 11 includes a dummy indicator for firms with access to public debt markets (BOND) and its interaction with alternative measures of tax avoidance (BONDTAX). The coefficients for the TAX variable indicate economically larger contracting costs for tax avoidance for firms with no access to public debt markets in comparison to those observed firms that do (BONDTAX). For example, focusing on cash ETRs, a standard deviation increase in tax avoidance results in 9.40BPS increase in loan spreads. This amount is significantly larger than 7.50BPS increase in loan spreads for a corresponding increase in cash ETRs observed in Table 2. Similarly, loan spreads increase by 8.68BPS, 6.49BPS and 5BPS for a given standard deviation increase in BTDs, PBTDs and DTAX measures, respectively, for firms with no access to public debt financing. Accordingly, economic magnitudes of the link between bank financing and these alternative forms of tax avoidance measures are much larger than those observed in baseline models in Table 2. Moreover, coefficients

[20] I further discuss potential reasons for these observations including sample and model-specific limitations in section 7.

[21] In un-tabulated analyses I also use 2-stage Heckman model to control for self-selection into loan-specific risk mitigation clauses. My results remain robust under this alternative methodology.

for the BONDTAX interaction variable suggests that having access to public debt financing offsets between 50% to 100% of the additional risk premium required for tax avoidance depending on the alternative tax avoidance strategy examined.

Next, in Panel B, I generate a sub-sample of firms with no access to public debt financing. This alternative model specification provides a layer of robustness test to the analysis in Panel A which use a dummy indicator to identify firms with access to public debt markets. The coefficients for the TAX variable are closely comparable to those obtained in Panel A. In economic terms, loan spreads increase by 9.53BPS, 7.93BPS, 6.24BPS and 4.80BPS for a given standard deviation increase in CETRs, BTDs, PBTDs and DTAX measures, respectively.

Finally, in Panel C I control for the self-selection into public bond market access. Although in theory firms prefer to access public debt markets once they build sufficient reputational capital (Diamond, 1989, 1991), in practice firms might prefer to access to these markets much sooner (Rajan, 1992; Werner and Gilson 1999; Hale and Santos, 2008). Although these issues are more likely to be non-investment grade (Werner and Gilson, 1999) such a move will, to an extent, increase firm level information environment and financial flexibility. More important, this empirical observation necessitates controlling for self-selection bias into public debt financing. The results in this panel strengthens the argument that on average, firms with no public market access face larger contracting costs of tax avoidance. The economic magnitudes observed for TAX variable is largely comparable to those observed in Panel A and Panel B.[22]

Table 12 tests the effectiveness syndicate-level risk mitigation mechanisms and the *acquired credibility* via access to public debt financing in alleviating contracting costs associated with tax avoidance. The intake from this analysis is that, both mechanisms operate as complements in moderating tax-specific risk premiums. Nonetheless, the economic effects observed for the *acquired credibility* via bond market access is larger in comparison to those observed for syndicate-level risk mitigating mechanisms. In particular, I find that public bond market access is more effective at moderating tax-specific risks related to permanent-based strategies including discretionary-permanent strategies. Notable observation in both Table 11 and Table 12 is that discretionary tax avoidance is positively associated with loan spreads for firms with no access to public debt

[22] Given that I use a dataset that is constructed to run meaningful tax-specific analysis I control for firm level access to public debt markets in retrospective perspective. That is, given that I run bank loan data through tax-literature-standard sample composition criteria it makes little empirical sense to analyze first time access to bond financing as such analysis results in significant loss of meaningful data.

financing. Although the economic magnitude of this link is not as large as anticipated given the aggressiveness of these strategies (Frank et al., 2009; Wilson, 2009; McGuire, Omer and Wang, 2012), this positive link is almost entirely offset for firms with access to public debt markets. Altogether, these results are in accord with the theoretical and empirical arguments (Rajan, 1992; Santos and Winton, 2008; Hale and Santos, 2009; Ioannidou and Ongena, 2010) and indicate that having access to public bond markets moderate the positive link between tax-avoidance-led informational asymmetries (e,g., Desai and Dharmapala, 2006, 2009; Balakrishnan et al., 2011) and loan spreads (Shevlin et al., 2013). Therefore, the analysis supports the expected outcomes in hypothesis 5 (H5).

Finally in Table 13 I examine whether and if so the magnitude of the additional risk premiums bond investors demand for bearing ex-ante risks related to tax avoidance. The baseline results from column 2 to 5 show that, except for cash ETRs, bond market investor seem to demand no additional risk premium for accepting ex-ante tax risks associated with alternative tax avoidance strategies. Columns 6 to 9 examines contracting costs of tax avoidance for investment-grade and non-investment grade issues. The coefficients for HYBTAX which controls for contracting costs of tax avoidance for non-investment grade issues are positive and statistically significant for all tax avoidance strategies except for DTAX. On the other hand, I find no statistically significant link between tax avoidance and cost of debt for investment-grade issues. The economic magnitude of the contracting costs of tax avoidance is significantly larger for high-yield bonds than those priori documented for firms with financial constraints (Table 3 and Table 6) and severe information asymmetries (Table 4 and Table 7). For example, for a standard deviation decrease in cash ETRs loan spreads increase by 17BPS for non-investment grade issues. Similarly, for a standard deviation increase in total and permanent BTDs loan spreads increase by 20BPS and 30BPS, respectively, for non-investment grade issues. In addition, independently of the controlled set of firm characteristics (e.g., tax aggressive, highly leveraged), public bond issues have larger spreads, particularly for high-yield issues (un-tabulated), in comparison those observed in syndicate loans. Altogether, these observations are in line with the hypothesis 6 (H6) and confirm that public bond investors rely more on price-based loan terms in targeting overall (e.g., Bharath et al., 2008) and/or tax-specific agency frictions.

5. MODEL and SAMPLE-SPECIFIC LIMITATIONS and FURTHER DISCUSSIONS

Despite using a number of model and sample specifications the analysis is likely to suffer from potential data construction limitations observed in many papers in the tax literature. For the purposes of examining tax-focused research questions I run the basic Compustat data through a set of selection criteria that eliminates loss making firm-year observations and truncate ETR data at [0,1] intervals. This sample construction strategy is in

line with those applied in the past tax-focused research (e.g., Dyreng et al., 2008; Shevlin et al., 2013) and allows one to meaningfully identify and interpret aggressive levels of corporate tax avoidance. On the downside, apart from eliminating large sample of observations, this data construction strategy also results in positively skewed test and control variables. To control for the effects of potential outliers in the sample I conduct the entire analysis using quantile regression conditioned at the median of the observations. My results remain qualitatively the same for all alternative sample compositions, including firms with financial constraints and information asymmetries, under this alternative analysis. Nonetheless, I acknowledge that, pertinent to the research objectives of this study, which connects tax literature with financial contracting literature, sample construction criteria might eliminate some empirically-useful data.

For example, one could argue that a sample composition that incorporates loss making firms would potentially better reflect the effects of firm-level financial constraints and information asymmetries on bank financing. However, despite the data-driven limitations, I can confidently argue that the analysis does a decent job at capturing the overall link between contracting costs and firm-level financial constraints and information asymmetries. For example, intercept terms, which reflect loan spreads banks charge independently of the controlled set of firm characteristics (e.g., tax aggressive, highly leveraged), are significantly larger for firms with financial constraints and severe information asymmetries in comparison to firms that do not. Likewise, although un-tabulated for the sake of brevity, syndicate-level risk mitigating mechanisms are more effective at moderating general agency costs associated with debt financing for firms with financial constraints and informational asymmetries.

I argue that the criteria used in identifying firms with financial constraints and information asymmetries is likely to have enhanced empirical strength of these alternative model/sample specifications. First, given that the sample excludes loss-making firm-years I do not rely on model-based criteria, including KZ Index as in (Lamont, Polk and Saaá-Requejo, 2001) or WV Index as in (Whited and Wu, 2006), in identifying financially constrained firms. At its origins, both models are constructed using a complete universe of Compustat firms that include loss-making firm-year observations. Accordingly, using the predicted coefficients from these alternative models to estimate score-based measures of financial constraints would generate significantly biased estimates for the sample used in this study. Thus, I rely on issue and/or firm-level ratings-based criteria in identifying financially constrained firms which allows me to alleviate potential data-related biases. To circumvent around the endogenous nature of the credit rating acquisition process (Bannier, Behr and Guttler, 2009; Faure-Grimaud, Peyrache and Quesada, 2009; Hill, 2010), I use issue-level credit ratings given that both Moody's and S&P have

the policy to rate issuers whether or not they have a particular rating agreement with the rating agencies themselves (Hale and Santos, 2008). My results regarding the link between contracting costs of bank financing and financial constraints are robust to using these alternative ratings-based criteria used to identify financially constrained firms. Moreover, unlike previous studies (e.g., Dennis and Mullineaux, 2000; Sufi, 2007; Chaudhry and Kleimeier, 2013; Shevlin et al., 2013) I use industry-adjusted composite measure to identify firms with information asymmetries. In doing so I obtain a cleaner measure of information asymmetries that controls for industry characteristics and alleviates potential data-related biases. Overall, the analysis provides strong support to the arguments made in finance literature regarding contracting costs for firms with financial constraints and informational asymmetries (e.g., Faulkender and Petersen, 2006).

Moreover, my analyses indicate that, among syndicate-level risk mitigating mechanisms, syndicate-lead size and performance pricing provisions are more effective, ex-ante, at moderating tax-specific agency costs associated with bank financing while total loan participation, lead-level reputation and loan ownership are not. A notable observation in figure 2 is that banks are systematically increasing the number and the quality of the lead arrangers in a typical syndicated loan while at the same time reducing lead ownership ratio in proportion to total loan amount outstanding. This definitive trend in syndicate origination dynamics suggest that both lead banks and borrowers increasingly value the diversification benefits and the quality of the lead-syndicate formation rather than focusing on loan ownership structure alone. In line with this empirical observation, I find smaller benefits to greater lead-agent ownership in alleviating general agency frictions between borrowers and lenders in comparison to those observed for syndicate-lead size and lead-agent reputation. These results are intuitive given that originator banks hold up larger portion of the loans primarily to alleviate potential informational asymmetries between the syndicate lead and the non-lead loan participants. Moreover, larger lead loan ownership ratio moderates diversification benefits achievable by sharing credit risk exposure to a given borrower and/or industry (e.g., Mora, 2015).

On the other hand, I fail to document a concrete link between lead agent reputation and agency costs of tax avoidance. For the sample examined, the most reputable banks (top 5 lenders per year) facilitate up to more than half of the total syndicated loans outstanding in a given year. Expectedly, these banks have access to a large network of borrowers across multiple industries as well as peer banks with loan origination capacity through past lending relations. Accordingly, reputable banks should arguably have acquired substantial expertise in identifying and monitoring firm-specific risks including those related to corporate tax avoidance. In the light of this evidence, one can argue that loans with larger proportion of reputable lead arrangers should, to an extent,

alleviate contracting costs associated with tax avoidance. This argument implicitly assumes that ex-ante risks related to corporate tax avoidance are better understood and more appropriately priced in for loans with more reputable lenders. Importantly, however, the analysis argues on the benefits of increased participation in lead-level credit risk sharing and/or the application of non-price terms that effectively aligns borrower-lender incentives. In fact, firms might utilize remarkably complex but also effective tax avoidance strategies that survive under even rigorous IRS scrutiny that includes random and face-to-face audits (e.g., De Simone et al., 2015). Given this evidence in hand, it becomes more apparent that the negative link between syndicate-lead size and agency costs of tax avoidance is *not* the result of a positive relation between syndicate-lead size and lenders' reputation and/or tax expertise. Instead, the analysis indicates that by allocating the loan shares among other lead agents banks are able to diversify-away some of the firm-specific risks, including those related to corporate tax avoidance. This line of thinking might explain why one might not observe statistically strong link between lead-lender reputation and contracting costs of tax avoidance.. Alternatively, however, these results could also reflect sample and/or modelling limitations that econometrically does not capture the genuine link between lender reputation and contracting costs of tax avoidance.

A similar argument goes for the results obtained using performance pricing provisions and the composite proxy for syndicate-level risk mitigation. For example, performance pricing provisions are likely to take corporate tax avoidance at a face value but incorporate contractual terms that effectively adjust (increase) loan premiums should firm performance/creditworthiness deteriorates. Therefore, syndicate participants would be safeguarded against sudden deterioration in firm-level liquidity and/or reputation as a results of large IRS settlements which might even initiate credit rating downgrades on certain occasions (see Hasan et al., (2014) p.113). In additional (un-tabulated) analysis I examine whether corporate tax avoidance is associated with covenant intensity (as in Hasan et al., 2014), lead and non-lead level syndicate participation, loan maturity and/or loan facilities with performance pricing provisions. Using alternative model and sample specifications I fail to find any link between aggressive levels of tax avoidance and alternative non-price-based contractual terms. These results indicate that banks are more likely to focus on price-based protection against tax-specific risks rather than non-price terms. Accordingly, I conjecture that, given the documented escalation in competition for corporate lending business borrowers are likely to demand more flexible contractual terms (i.e. PPPs) that alleviate agency frictions associated with bank lending.

8. CONCLUSION

In this paper I revisit and significantly expand the empirical evidence in contracting costs associate with corporate tax avoidance (Kim et al., 2010; Lisowsky et al., 2011; Shevlin et al., 2013; Hasan et al., 2014). In particular, I focus on priori unexplored syndicate-level risk mitigating mechanisms including alternative loan formation and contractual design alternatives and their role in alleviating agency costs associated with tax avoidance. Baseline results confirm that creditors understand and appropriately price in ex-ante risks inherent in aggressive levels of tax avoidance (Shevlin et al., 2013; Hasan et al., 2014), particularly for firms with financial constraints and information asymmetries. Accordingly, I document that while providing firms with vital liquidity when most needed (Ayers, et al, 2011; Edwards et al., 2016), tax avoidance is perceived to be particularly risky for financially constrained firms and results in relatively larger loan spreads. Notably, however, the positive link between tax avoidance and loan spreads is substantially mitigated for loans with large syndicate-lead formations and performance pricing provisions that facilitate credit risk diversification and borrower-lender incentive alignment, respectively. In fact, these loan-specific risk mitigating mechanisms are more effective at moderating contracting costs associated with tax avoidance for firms with financial constraints and information asymmetries. These observations suggest lower contracting costs to tax avoidance than previously documented (Shevlin et al., 2013; Hasan et al., 2014) when borrower-lender incentives are aligned and/or ex-ante risks associated with tax avoidance are diversified away among the syndicate-lead.

Moreover, the analysis documents a strong negative link between simultaneous access to public and private financing and contracting costs of tax avoidance. In line with the hold-up costs associated with single-bank lending (e.g., Rajan, 1992, Houston and James, 1996; Santos and Winton, 2008; Hale and Santos, 2009; Ioannidou and Ongena, 2010; Schenone, 2010), I find that increased financial flexibility and informational environment via public debt financing (Cantillo and Wright, 2000; James and Smith, 2000) help alleviate potentially escalated agency costs associated with corporate tax avoidance (Desai and Dharmapala, 2006, Desai et al., 2007; Balakrishnan et al., 2011). These results extend prior literature which implicitly assumes that firms hold either bank-originated or arm's length public debt financing but not both facilities concurrently (Kim et al., 2010; Lisowsky et al., 2011; Shevlin et al., 2013; Hasan et al., 2014). In addition, I confirm that public bond investors rely prominently on price-based loan terms in targeting overall (e.g., Bharath et al., 2008) and/or tax-specific agency frictions (Hasan et al., 2014). Importantly, however, I find that the positive link between tax avoidance and public debt financing is confined to issues with non-investment grade ratings.

Finally, to the best of my knowledge this is the first study to empirically compare *ex-ante* effectiveness of alternative contractual mechanisms in mitigating agency costs associated with a targeted risk-taking incentive (tax

avoidance). Specifically, I show that more innovative performance pricing clauses are more effective, ex-ante, in mitigating risks related to elevated levels of tax avoidance in comparison to more traditional covenant-based structures. This observation is in line renegotiation-induced effectiveness of covenant-based loan structures that facilitates contingent transfer of control rights following technical/actual defaults rather than establishing *ex-ante* commitment mechanisms (Roberts and Chava, 2008, Roberts and Sufi, 2009a; Nini et al., 2009; Francis et al., 2016; Christensen, et al., 2016). Similarly, I am aware of no other paper that empirically tests the effectiveness of risk diversification mechanisms available in syndicated loan facilities in alleviating ex-ante risks associated with a particular risk-taking incentive (tax avoidance).

Altogether, focusing on the priori unexplored aspects of contracting costs of tax avoidance the analysis reveals potential use of alternative contract design mechanisms through which tax-specific risks are either diversified-away among the syndicate-lead and/or largely assumed by the borrower in question. Pertinent to the ongoing research agenda in tax literature (see Hanlon and Heitzman, 2010), these results help identify channels through which non-tax costs associated with tax avoidance can be mitigated and rationalize the empirical observations that document persistent decrease in effective tax rates (e.g., Dyreng et al., 2008, 2015; GAO, 2008; 2016).

9. REFERENCES

Ahmed, A.S., Billings, B.K., Stanford, M.H., Morton, R.M., 2000. Accounting conservatism and cost of debt: An empirical test of efficient contracting. Available at SSRN 275551.

Almeida, H., Campello, M., Weisbach, M.S., 2004. The cash flow sensitivity of cash. The Journal of Finance 59, 1777–1804.

Asquith, P., Beatty, A., Weber, J., 2005. Performance pricing in bank debt contracts. Journal of Accounting and Economics 40, 101–128. doi:10.1016/j.jacceco.2004.09.005

Armstrong, J., 2003. The syndicated loan market: Developments in the North American context. Bank of Canada Working Paper 2003-15.

Armstrong, C.S., Guay, W.R., Weber, J.P., 2010. The role of information and financial reporting in corporate governance and debt contracting. Journal of Accounting and Economics 50, 179–234. doi:10.1016/j.jacceco.2010.10.001

Ashbaugh-Skaife, H., Collins, D.W., LaFond, R., 2006. The effects of corporate governance on firms' credit ratings. Journal of Accounting and Economics, Conference Issue on Implications of Changing Financial Reporting Standards 42, 203–243. doi:10.1016/j.jacceco.2006.02.003

Ayers, B.C., Laplante, S.K., Schwab, C.M., 2011. Does Tax Deferral Enhance Firm Value? Available at SSRN 1976606.

Baker, M., Wurgler, J., 2002. Market Timing and Capital Structure. The Journal of Finance 57, 1–32. doi:10.1111/1540-6261.00414

Balakrishnan, K., Blouin, J.L., Guay, W.R., 2012. Does Tax Aggressiveness Reduce Corporate Transparency? Available at SSRN 1792783.

Ball, R., Bushman, R.M., Vasvari, F.P., 2008. The Debt-Contracting Value of Accounting Information and Loan Syndicate Structure. Journal of Accounting Research 46, 247–287. doi:10.1111/j.1475-679X.2008.00273.x

Begley, J., Freedman, R., 2004. The Changing Role of Accounting Numbers in Public Lending Agreements. Accounting Horizons 18, 81–96. doi:10.2308/acch.2004.18.2.81

Berger, A.N., Udell, G.F., 1995. Relationship Lending and Lines of Credit in Small Firm Finance. The Journal of Business 68, 351–381.
Berlin, M., Mester, L.J., 1992. Debt covenants and renegotiation. Journal of Financial Intermediation 2, 95–133.
Bharath, S.T., Sunder, J., Sunder, S.V., 2008. Accounting Quality and Debt Contracting. The Accounting Review 83, 1–28. doi:10.2308/accr.2008.83.1.1
Biddle, G.C., Hilary, G., 2006. Accounting Quality and Firm-Level Capital Investment. The Accounting Review 81, 963–982. doi:10.2308/accr.2006.81.5.963
Blouin, J., 2014. Defining and measuring tax planning aggressiveness. National Tax Journal 67, 875–900.
Boot, A.W.A., 2000. Relationship Banking: What Do We Know? Journal of Financial Intermediation 9, 7–25. doi:10.1006/jfin.2000.0282
Bowen, R.M., Chen, X., Cheng, Q., 2008. Analyst Coverage and the Cost of Raising Equity Capital: Evidence from Underpricing of Seasoned Equity Offerings. Contemporary Accounting Research 25, 657–700. doi:10.1506/car.25.3.1
Burns, N., Kedia, S., Lipson, M., 2010. Institutional ownership and monitoring: Evidence from financial misreporting. Journal of Corporate Finance 16, 443–455. doi:10.1016/j.jcorpfin.2010.06.001
Campello, M., Giambona, E., others, 2010. Capital Structure and the Redeployability of Tangible Assets.
Campello, M., Giambona, E., Graham, J.R., Harvey, C.R., 2011. Liquidity Management and Corporate Investment During a Financial Crisis. Rev. Financ. Stud. 24, 1944–1979. doi:10.1093/rfs/hhq131
Cantillo, M., Wright, J., 2000. How Do Firms Choose Their Lenders? An Empirical Investigation. The Review of Financial Studies 13, 155–189.
Carey, M., Prowse, S., Rhea, J., Udel, G., 2012. "The Economics of the Private Placement Markets: A New Look". Financial Markets and Instruments, 1993, 2.
Chaudhry, S., Kleimeier, S., 2013. Information asymmetry and the structure of loan syndicates. Discussion Paper. University of Birmingham, Birmingham.
Chava, S., Roberts, M.R., 2008. How Does Financing Impact Investment? The Role of Debt Covenants. The Journal of Finance 63, 2085–2121.
Chava, S., Kumar, P., Warga, A., 2010. Managerial Agency and Bond Covenants. The Review of Financial Studies 23, 1120–1148.
Chemmanur, T.J., Fulghieri, P., 1994. Reputation, Renegotiation, and the Choice between Bank Loans and Publicly Traded Debt. The Review of Financial Studies 7, 475–506.
Christensen, H.B., Nikolaev, V.V., Wittenberg-Moerman, R., 2016. Accounting Information in Financial Contracting: The Incomplete Contract Theory Perspective. Journal of Accounting Research 54, 397–435. doi:10.1111/1475-679X.12108
Chung, K.H., Zhang, H., 2011. Corporate Governance and Institutional Ownership. Journal of Financial and Quantitative Analysis 46, 247–273. doi:10.1017/S0022109010000682
Colla, P., Ippolito, F., Li, K., 2013. Debt Specialization. The Journal of Finance 68, 2117–2141. doi:10.1111/jofi.12052
Datta, S., Iskandar-Datta, M., Patel, A., 1999. Bank monitoring and the pricing of corporate public debt1. Journal of Financial Economics 51, 435–449. doi:10.1016/S0304-405X(98)00060-9
Dechow, P.M., Kothari, S.P., L. Watts, R., 1998. The relation between earnings and cash flows. Journal of Accounting and Economics 25, 133–168. doi:10.1016/S0165-4101(98)00020-2
Demiroglu, C., James, C.M., 2010. The Information Content of Bank Loan Covenants. The Review of Financial Studies 23, 3700–3737.
Dennis, S.A., Mullineaux, D.J., 2000. Syndicated Loans. Journal of Financial Intermediation 9, 404–426. doi:10.1006/jfin.2000.0298
Denis, D.J., Mihov, V.T., 2003. The choice among bank debt, non-bank private debt, and public debt: evidence from new corporate borrowings. Journal of Financial Economics 70, 3–28. doi:10.1016/S0304-405X(03)00140-5
Diamond, D.W., 1984. Financial Intermediation and Delegated Monitoring. The Review of Economic Studies 51, 393–414. doi:10.2307/2297430
Diamond, D.W., 1989. Reputation Acquisition in Debt Markets. Journal of Political Economy 97, 828–862.

Diamond, D.W., 1991. Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt. Journal of Political Economy 99, 689–721.
Desai, M.A., Dharmapala, D., 2009. Corporate Tax Avoidance and Firm Value. Review of Economics and Statistics 91, 537–546. doi:10.1162/rest.91.3.537
Desai, M.A., Dharmapala, D., 2006. Corporate tax avoidance and high-powered incentives. Journal of Financial Economics 79, 145–179. doi:10.1016/j.jfineco.2005.02.002
Desai, M.A., Dyck, A., Zingales, L., 2007. Theft and taxes. Journal of Financial Economics 84, 591–623. doi:10.1016/j.jfineco.2006.05.005
De Simone, L., Stomberg, B., 2012. Do investors differentially value tax avoidance of income mobile firms? Available at SSRN 2102903.
De Simone, L., Mills, L.F., Stomberg, B., 2015. Examining the IRS Audit Outcomes of Income Mobile Firms.
Dichev, I.D., Skinner, D.J., 2002. Large–Sample Evidence on the Debt Covenant Hypothesis. Journal of Accounting Research 40, 1091–1123. doi:10.1111/1475-679X.00083
Donohoe, M.P., McGill, G.A., Outslay, E., 2014. Risky business: The prosopography of corporate tax planning. National Tax Journal 67.
Drake, K.D., Lusch, S.J., Stekelberg, J., 2016. Investor Valuation of Tax Avoidance and Tax.
Dyreng, S., Hanlon, M., Maydew, E.L., Thornock, J.R., 2015. Changes in corporate effective tax rates over the past twenty-five years. Available at SSRN 2521497.
Edwards, A., Schwab, C., Shevlin, T., 2016. Financial Constraints and Cash Tax Savings. The Accounting Review 91, 859–881. doi:10.2308/accr-51282
Ertan, A., Karolyi, S.A., 2016. Debt Covenants and the Expected Cost of Technical Default. Available at SSRN 2795226.
Fama, E.F., 1985. What's different about banks? Journal of monetary economics 15, 29–39.
Faulkender, M., Petersen, M.A., 2006. Does the Source of Capital Affect Capital Structure? Rev. Financ. Stud. 19, 45–79. doi:10.1093/rfs/hhj003
Fazzari, S.M., Hubbard, R.G., Petersen, B.C., Blinder, A.S., Poterba, J.M., 1988. Financing Constraints and Corporate Investment. Brookings Papers on Economic Activity 1988, 141–206. doi:10.2307/2534426
Francis, J., LaFond, R., Olsson, P., Schipper, K., 2005. The market pricing of accruals quality. Journal of Accounting and Economics 39, 295–327. doi:10.1016/j.jacceco.2004.06.003
Francis, B., Shen, Y., Wu, Q., 2016. Do Creditor Control Rights Impact Corporate Tax Avoidance? Evidence from Debt Covenant Violations.
Frank, M.M., Lynch, L.J., Rego, S.O., 2009. Tax Reporting Aggressiveness and Its Relation to Aggressive Financial Reporting. The Accounting Review 84, 467–496. doi:10.2308/accr.2009.84.2.467
Gârleanu, N., Zwiebel, J., 2009. Design and Renegotiation of Debt Covenants. The Review of Financial Studies 22, 749–781.
Gallemore, J., Gipper, B., Maydew, E.L., 2016. Banks as Tax Planning Intermediaries. Available at SSRN 2796132.
Gilson, S.C., Warner, J.B., 1997. Junk Bonds, Bank Debt, and Financing Corporate Growth (SSRN Scholarly Paper No. ID 47269). Social Science Research Network, Rochester, NY.
Goh, B.W., Lee, J., Lim, C.Y., Shevlin, T., 2013. The effect of corporate tax avoidance on the cost of equity. The Accounting Review.
Gonzalez-Cabral, A.C., Isin, A.A., 2016. Cost of Tax Avoidance: Examining the Role of Product Market Structure. Available at SSRN 2813804.
Guenther, D.A., Matsunaga, S.R., Williams, B.M., 2016. Is Tax Avoidance Related to Firm Risk? The Accounting Review.
Hale, G., Santos, J.A.C., 2008. The decision to first enter the public bond market: The role of firm reputation, funding choices, and bank relationships. Journal of Banking & Finance 32, 1928–1940. doi:10.1016/j.jbankfin.2007.12.016
Hanlon, M., Slemrod, J., 2009. What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement. Journal of Public Economics 93, 126–141. doi:10.1016/j.jpubeco.2008.09.004

Hanlon, M., Heitzman, S., 2010. A review of tax research. Journal of Accounting and Economics 50, 127–178. doi:10.1016/j.jacceco.2010.09.002
Harford, J., Klasa, S., Maxwell, W.F., 2014. Refinancing Risk and Cash Holdings. The Journal of Finance 69, 975–1012. doi:10.1111/jofi.12133
Harris, M., Raviv, A., 1991. The Theory of Capital Structure. The Journal of Finance 46, 297–355. doi:10.1111/j.1540-6261.1991.tb03753.x
Hasan, I., Hoi, C.K. (Stan), Wu, Q., Zhang, H., 2014. Beauty is in the eye of the beholder: The effect of corporate tax avoidance on the cost of bank loans. Journal of Financial Economics 113, 109–130. doi:10.1016/j.jfineco.2014.03.004
Houston, J., James, C., 1996. Bank Information Monopolies and the Mix of Private and Public Debt Claims. The Journal of Finance 51, 1863. doi:10.2307/2329541
Houston, J.F., James, C.M., 2001. Do Relationships Have Limits? Banking Relationships, Financial Constraints, and Investment. The Journal of Business 74, 347–374. doi:10.1086/321930
Ioannidou, V., Ongena, S., 2010. "Time for a change": loan conditions and bank behavior when firms switch banks. The Journal of Finance 65, 1847–1877.
James, C., Smith, D.C., 2000. Are Banks Still Special? New Evidence on Their Role in the Corporate Capital-Raising Process. Journal of Applied Corporate Finance 13, 52–63. doi:10.1111/j.1745-6622.2000.tb00041.x
Jensen, M.C., Meckling, W.H., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics 3, 305–360. doi:10.1016/0304-405X(76)90026-X
Jiambalvo, J., Rajgopal, S., Venkatachalam, M., 2002. Institutional Ownership and the Extent to which Stock Prices Reflect Future Earnings. Contemporary Accounting Research 19, 117–145. doi:10.1506/EQUA-NVJ9-E712-UKBJ
Kim, D., Qi, Y., 2010. Accruals Quality, Stock Returns, and Macroeconomic Conditions. The Accounting Review 85, 937–978. doi:10.2308/accr.2010.85.3.937
Kim, J.-B., Li, O.Z., Li, Y., 2010. Corporate tax avoidance and bank loan contracting. Available at SSRN 1596209.
Kim, S., Schmidt, A., Wentland, K., 2014. Analysts and taxes. Available at SSRN 2482733.
Krishnaswami, S., Spindt, P.A., Subramaniam, V., 1999. Information asymmetry, monitoring, and the placement structure of corporate debt1. Journal of Financial Economics 51, 407–434. doi:10.1016/S0304-405X(98)00059-2
Kwan, S.H., Carleton, W.T., 2010. Financial Contracting and the Choice between Private Placement and Publicly Offered Bonds. Journal of Money, Credit and Banking 42, 907–929. doi:10.1111/j.1538-4616.2010.00312.x
Lamont, O., Polk, C., Saaá-Requejo, J., 2001. Financial Constraints and Stock Returns. Rev. Financ. Stud. 14, 529–554. doi:10.1093/rfs/14.2.529
Law, K.K.F., Mills, L.F., 2015. Taxes and Financial Constraints: Evidence from Linguistic Cues: Taxes and Financial Constraints. Journal of Accounting Research 53, 777–819. doi:10.1111/1475-679X.12081
Lee, S.W., Mullineaux, D.J., 2004. Monitoring, Financial Distress, and the Structure of Commercial Lending Syndicates. Financial Management 33, 107–130.
Lisowsky, P., Mescall, D., Novack, G., Pittman, J., 2011. The importance of tax aggressiveness to corporate borrowing costs. Working paper; 2011.
Manso, G., Strulovici, B., Tchistyi, A., 2010. Performance-Sensitive Debt. Rev. Financ. Stud. 23, 1819–1854. doi:10.1093/rfs/hhq005
McGuire, S.T., Omer, T.C., Wang, D., 2012. Tax Avoidance: Does Tax-Specific Industry Expertise Make a Difference? The Accounting Review 87, 975–1003. doi:10.2308/accr-10215
Mora, N., 2015. Lender Exposure and Effort in the Syndicated Loan Market. Journal of Risk and Insurance 82, 205–252. doi:10.1111/jori.1202
Nini, G., Smith, D.C., Sufi, A., 2012. Creditor Control Rights, Corporate Governance, and Firm Value. The Review of Financial Studies 25, 1713–1761.
Ongena, S., Smith, D.C., 2001. The duration of bank relationships. Journal of Financial Economics 61, 449–475. doi:10.1016/S0304-405X(01)00069-1

Panyagometh, K., Roberts, G.S., 2010. Do Lead Banks Exploit Syndicate Participants? Evidence from Ex Post Risk. Financial Management 39, 273–299. doi:10.1111/j.1755-053X.2010.01073.x
Petersen, M.A., Rajan, R.G., 1995. The effect of credit market competition on lending relationships. The Quarterly Journal of Economics 407–443.
Pichler, P., Wilhelm, W., 2001. A Theory of the Syndicate: Form Follows Function. The Journal of Finance 56, 2237–2264. doi:10.1111/0022-1082.00404
Plumlee, M.A., 2003. The Effect of Information Complexity on Analysts' Use of That Information. The Accounting Review 78, 275–296. doi:10.2308/accr.2003.78.1.275
Rajan, R.G., 1992. Insiders and Outsiders: The Choice between Informed and Arm's-Length Debt. The Journal of Finance 47, 1367–1400. doi:10.2307/2328944
Rajan, R., Winton, A., 1995. Covenants and Collateral as Incentives to Monitor. The Journal of Finance 50, 1113–1146. doi:10.2307/2329346
Rajan, R.G., 2005. Has financial development made the world riskier? National Bureau of economic Research.
Ramakrishnan, R.T.S., Thakor, A.V., 1984. Information Reliability and a Theory of Financial Intermediation. Review of Economic Studies 51, 415–432. doi:10.2307/2297431
Rauh, J.D., Sufi, A., 2010. Capital Structure and Debt Structure. Rev. Financ. Stud. hhq095. doi:10.1093/rfs/hhq095
Roberts, M.R., Sufi, A., 2009. Renegotiation of financial contracts: Evidence from private credit agreements. Journal of Financial Economics 93, 159–184. doi:10.1016/j.jfineco.2008.08.005
Roberts, M.R., Sufi, A., 2009. Financial Contracting: A Survey of Empirical Research and Future Directions. Annual Review of Financial Economics 1, 207–226.
Robinson, L.A., Schmidt, A.P., 2013. Firm and Investor Responses to Uncertain Tax Benefit Disclosure Requirements. The Journal of the American Taxation Association 35, 85–120. doi:10.2308/atax-50458
Roulstone, D.T., 2003. Analyst Following and Market Liquidity. Contemporary Accounting Research 20, 552–578. doi:10.1506/X45Y-PMH7-PNYK-4ET1
Santos, J.A., Winton, A., 2008. Bank loans, bonds, and information monopolies across the business cycle. The Journal of Finance 63, 1315–1359.
Schenone, C., 2010. Lending relationships and information rents: Do banks exploit their information advantages? Review of Financial Studies 23, 1149–1199.
Shevlin, T.J., Urcan, O., Vasvari, F.P., 2013. Corporate tax avoidance and public debt costs. Available at SSRN 2228601.
Simons, K., 2003. Why Do Banks Syndicate Loans?.
Sufi, A., 2007. Information Asymmetry and Financing Arrangements: Evidence from Syndicated Loans. The Journal of Finance 62, 629–668. doi:10.1111/j.1540-6261.2007.01219.x
Vu, T., Skully, M.T., 2008. Why Do Banks Syndicate Loans? New Empirical Evidence. New Empirical Evidence.
Watts, R.L., 2003. Conservatism in Accounting Part I: Explanations and Implications. Accounting Horizons 17, 207–221. doi:10.2308/acch.2003.17.3.207
Weisbach, D. 2002. Ten truths about tax shelters, Tax Law Review, 55, 215-253
Whited, T.M., Wu, G., 2006. Financial Constraints Risk. Rev. Financ. Stud. 19, 531–559. doi:10.1093/rfs/hhj012
Wilson, R.J., 2009. An Examination of Corporate Tax Shelter Participants. The Accounting Review 84, 969–999. doi:10.2308/accr.2009.84.3.969

Table 1
Summary Statistics

Variables	Q1	Med	Mean	Q4	Sdev
Tax Measures					
CETR	0.13	0.26	0.25	0.35	0.14
GETR	0.27	0.35	0.32	0.38	0.12
LRCETR	0.19	0.27	0.26	0.33	0.11
BTD	-0.009	0.004	0.009	0.023	0.04
PBTD	0.003	0.013	0.022	0.03	0.05
DTAX	-0.025	0.00	0.0014	0.02	0.15
SDCETR	0.02	0.048	0.07	0.10	0.08
Loan Variables					
SPREAD	50	100	123	175	100
NOLEAD	1	3	3	5	2.17
NOPART	3	6	8	10	7.40
LEADPCT	0.20	0.33	0.45	0.83	0.34
LREP	0	0	0.44	1	0.50
COV	0	0	6.31	4	18.34
TERM	3	5	3.93	5	1.75
LNLOAN	4.83	5.79	5.70	6.62	1.37
REVD	1	1	.80	1	0.41
PPP	0	0	0.32	1	0.18
SECUR	0	0	0.38	0	0.27
Bond Variables					
SPREADB	88	148	218.05	288	193
NOLEADB	1	2	2.72	4	1.81
NOPARTB	4	7	8.44	12	6.30
TERMB	6	10	11	10	9.32
LNLOANB	5.52	6.39	6.36	7.31	1.38
HYB	0	0	0.27	1	0.45
Other Variables					
PIFO	0	0	0.02	0.02	0.04
CIS	0.014	0.018	0.0214	0.02	0.52
PTROA	0.064	0.10	0.12	0.16	0.09
LNTA	4.90	6.23	6.29	7.59	1.98
PPE	0.23	0.43	0.53	0.75	0.40
LVRG	0.007	0.14	0.18	0.28	0.21
AQ	0.02	0.029	0.035	0.04	0.03
ANFLW	1	4	6.40	10	7.5
INOWN	0.00	0.25	0.35	0.70	0.37
MTB	1.41	2.23	3.30	3.61	23

Table 1 presents summary statistics. In line with the past research all ETR measures are truncated between [0,1] intervals. Q1 and Q4 represent the bottom and top quartiles for each observation. All variables are explained in greater detail in Appendix A.

Table 2
Examination of Tax Avoidance and Loan Spreads

Panel A: Baseline Model - Syndicate-Level Risk Mitigation

Variables	CETR	TBTD	PBTD	DTAX
TAX	53.41***	117.06***	73.01	15.18**
	(0.00)	(0.00)	(0.15)	(0.03)
NLD	-13.68***	-12.79***	-12.59***	-9.42**
	(0.00)	(0.00)	(0.00)	(0.03)
$NOPART$	-8.66***	-8.28***	-8.48***	-8.88***
	(0.00)	(0.00)	(0.00)	(0.00)
PPP	-38.44***	-37.65***	-37.49***	-35.80***
	(0.00)	(0.00)	(0.00)	(0.00)
$LEADPCT$	-25.27**	-27.95**	-27.84**	-25.75***
	(0.01)	(0.00)	(0.00)	(0.00)
$LREP5$	-11.04***	-11.67***	-11.61***	-15.14***
	(0.00)	(0.00)	(0.00)	(0.00)
$TERM$	1.79**	1.20	1.18	2.05**
	(0.04)	(0.18)	(0.18)	(0.04)
$REVD$	-49.22***	-47.94***	-48.14***	-46.55***
	(0.00)	(0.00)	(0.00)	(0.00)
$SECUR$	-0.10	0.24	0.26	-0.83
	(0.96)	(0.90)	(0.90)	(0.71)
$LNLOAN$	3.66**	1.91	2.05	2.45
	(0.04)	(0.31)	(0.28)	(0.28)
$LNTA$	-21.25***	-20.08***	-20.14***	-20.44***
	(0.00)	(0.00)	(0.00)	(0.00)
$PTROA$	-166.82***	-189.21***	-179.13***	-168.54***
	(0.00)	(0.00)	(0.00)	(0.00)
$LVRG$	80.27***	84.83***	86.44***	85.47***
	(0.00)	(0.00)	(0.00)	(0.00)
$PIFO$	-72.56*	-68.69*	-70.87*	-60.57
	(0.05)	(0.08)	(0.08)	(0.16)
AQ	93.01*	80.90*	83.00	62.12
	(0.07)	(0.08)	(0.12)	(0.25)
PPE	-8.02*	-7.62*	-6.58	-0.76
	(0.09)	(0.09)	(0.14)	(0.88)
MTB	-0.01	-0.02	-0.01	-0.03
	(0.54)	(0.45)	(0.47)	(0.27)
$INOWN$	-14.69***	-14.55***	-15.23***	-20.62***
	(0.00)	(0.00)	(0.00)	(0.00)
$ANFLW$	-0.77***	-0.76***	-0.78***	-0.63***
	(0.00)	(0.00)	(0.00)	(0.00)
CIS	80.91***	76.39***	77.88***	82.70***
	(0.00)	(0.00)	(0.00)	(0.00)
$Constant$	190.25***	193.80***	188.71***	204.88***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.51	0.51	0.51	0.51
Obs	6456	5848	5848	4457

Panel B: Baseline Model - Composite Measure of Syndicate-Level Risk Mitigation				
Variables	**CETR**	**TBTD**	**PBTD**	**DTAX**
TAX	54.77***	107.47***	61.89	16.82**
	(0.00)	(0.00)	(0.15)	(0.02)
$CRISK$	-19.09***	-18.65***	-18.61***	-16.69***
	(0.00)	(0.00)	(0.00)	(0.00)
$TERM$	0.76	0.31	0.29	1.13
	(0.39)	(0.73)	(0.75)	(0.26)
$REVD$	-52.47***	-51.06***	-51.28***	-49.54***
	(0.00)	(0.00)	(0.00)	(0.00)
$SECUR$	-0.21	0.35	0.37	1.27
	(0.91)	(0.86)	(0.85)	(0.58)
$LNLOAN$	2.01	0.69	0.85	0.85
	(0.25)	(0.71)	(0.65)	(0.58)
$LNTA$	-20.29***	-19.22***	-19.33***	-19.76***
	(0.00)	(0.00)	(0.00)	(0.00)
$PTROA$	-164.19***	-187.42***	-177.69***	-168.59***
	(0.00)	(0.00)	(0.00)	(0.00)
$LVRG$	81.54***	86.96***	88.49	86.33***
	(0.00)	(0.00)	(0.00)	(0.00)
$PIFO$	-80.36**	-76.35*	-77.92*	-63.36
	(0.03)	(0.05)	(0.06)	(0.15)
AQ	96.61*	91.92*	94.28*	74.75
	(0.07)	(0.10)	(0.10)	(0.19)
PPE	-7.14	-6.47*	-5.55	0.29
	(0.14)	(0.09)	(0.23)	(0.24)
MTB	-0.01	-0.01	-0.01	-0.02
	(0.66)	(0.52)	(0.54)	(0.46)
$INOWN$	-17.21***	-16.54***	-17.23***	-21.99***
	(0.00)	(0.00)	(0.00)	(0.00)
$ANFLW$	-0.70***	-0.70***	-0.71***	-0.56***
	(0.00)	(0.00)	(0.00)	(0.00)
CIS	76.34***	72.24***	73.74***	77.56***
	(0.00)	(0.00)	(0.00)	(0.00)
$Constant$	178.86***	177.97***	173.39***	198.38***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.48	0.49	0.48	0.48
Obs	6456	5848	5848	4457

Table 2 runs the baseline model (eq.(1)) using the total loan-level sample of observations. Panel A incorporates all syndicate-level risk mitigating factors alongside with loan and firm-level control variables. Panel B replaces syndicate-level risk mitigating factors with the composite measure (CRM) calculated using a combination of these alternative risk-mitigating factors. See Appendix A for the description and the calculation of the measure. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for $p < 10\%$, ** is used for $p < 5\%$ *** is used for $p < 1\%$ significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

Table 3
The Effects of Financial Constraints on Tax Avoidance and Loan Spreads

Panel A: Non-Investment Grade Firms - Syndicate-Level Risk Mitigation

Variables	CETR	BTD	PBTD	DTAX
TAX	55.75***	117.06***	125.37**	7.88
	(0.00)	(0.00)	(0.04)	(0.27)
$NOLEAD$	-12.12***	-12.79**	-10.95**	-8.18***
	(0.00)	(0.00)	(0.01)	(0.00)
PPP	-42.17***	-37.65***	-40.84***	-39.45***
	(0.00)	(0.00)	(0.00)	(0.00)
$Constant$	170.91***	193.80***	167.66***	193.05***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.48	0.51	0.49	0.48
Obs	5066	4580	4580	3454

Panel B: Investment Grade Firms - Syndicate-Level Risk Mitigation

Variables	CETR	BTD	PBTD	DTAX
TAX	22.23	50.65	-37.22	17.09*
	(0.14)	(0.38)	(0.43)	(0.10)
$NOLEAD$	-2.75	-2.40	-2.38	-0.68
	(0.65)	(0.73)	(0.73)	(0.92)
PPP	-17.38***	-18.01	-17.51***	-17.06***
	(0.00)	(0.80)	(0.00)	(0.00)
$Constant$	106.31*	123.62*	116.97*	109.62
	(0.10)	(0.09)	(0.10)	(0.13)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.48	0.48	0.48	0.47
Obs	1390	1268	1268	1003

Panel C: Non-Investment Grade Firms - Composite Measure of Syndicate-Level Risk Mitigation

Variables	CETR	BTD	PBTD	DTAX
TAX	58.81***	125.69***	116.77*	11.90*
	(0.00)	(0.00)	(0.06)	(0.10)
CRM	-19.78***	-19.10***	-19.13**	-16.78***
	(0.00)	(0.00)	(0.00)	(0.00)
$Constant$	164.83***	163.58***	157.56***	182.52***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.45	0.46	0.46	0.44
Obs	5066	4580	4580	3454

Panel D: Investment Grade Firms - Composite Measure of Syndicate-Level Risk Mitigation

Variables	CETR	BTD	PBTD	DTAX
TAX	16.93	33.10	-44.98	17.42*
	(0.13)	(0.55)	(0.43)	(0.10)
CRM	-11.37***	-11.00***	-10.85***	-9.67***
	(0.00)	(0.00)	(0.00)	(0.00)
$Constant$	68.27	84.07	79.60	92.92
	(0.27)	(0.24)	(0.27)	(0.35)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.47	0.47	0.47	0.46
Obs	1390	1268	1268	1003

Table 3 runs the baseline model separately for firms with and no financial constraints. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Panel A and Panel B both incorporate syndicate-lead formation and performance pricing provisions and Panel C incorporates the composite measure of syndicate-level risk mitigating factors into the

model. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for $p < 10\%$, ** is used for $p < 5\%$ *** is used for $p < 1\%$ significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

Table 4
The Effects of Information Asymmetries on Tax Avoidance and Loan Spreads

Panel A: High-Information Asymmetries - Syndicate-Level Risk Mitigation

Variables	CETR	BTD	PBTD	DTAX
TAX	59.06***	125.89***	165.75**	22.80**
	(0.00)	(0.00)	(0.02)	(0.03)
NLD	-11.16**	-10.51**	-10.56**	-10.03**
	(0.03)	(0.04)	(0.04)	(0.03)
PPP	-43.12***	-42.42***	-42.30***	-37.03***
	(0.00)	(0.00)	(0.00)	(0.00)
$Constant$	211.56***	218.31***	213.20***	208.65***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.48	0.48	0.48	0.49
Obs	3781	3397	3389	3789

Panel B: Low-Information Asymmetries - Syndicate-Level Risk Mitigation

Variables	CETR	BTD	PBTD	DTAX
TAX	46.67***	110.69**	-30.70	4.89
	(0.00)	(0.04)	(0.62)	(0.69)
$NOLEAD$	-16.69***	-13.04***	-14.65**	-9.31
	(0.00)	(0.00)	(0.01)	(0.47)
PPP	-27.79***	-26.94***	-26.55***	-20.72***
	(0.00)	(0.00)	(0.00)	(0.00)
$Constant$	166.03***	155.62***	147.94***	152.01**
	(0.00)	(0.00)	(0.00)	(0.04)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.57	0.58	0.58	0.66
Obs	2675	2451	2451	668

Panel C: High-Information Asymmetries - Composite Measure of Syndicate-Level Risk Mitigation

Variables	CETR	BTD	PBTD	DTAX
TAX	62.84***	120.80	156.68**	23.61*
	(0.00)	(0.64)	(0.04)	(0.05)
CRM	-20.75***	-20.07***	-20.00***	-17.72***
	(0.00)	(0.00)	(0.00)	(0.00)
$Constant$	212.36***	212.98***	208.01***	207.71***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.44	0.44	0.44	0.46
Obs	3781	3397	3397	3789

Panel D: Low-Information Asymmetries - Composite Measure of Syndicate-Level Risk Mitigation

Variables	CETR	BTD	PBTD	DTAX
TAX	46.12***	95.20*	-38.30	6.56
	(0.00)	(0.07)	(0.49)	(0.58)
CRM	-18.33***	-18.16***	-18.26***	-15.82***
	(0.00)	(0.00)	(0.00)	(0.00)
$Constant$	149.77***	138.78***	133.26***	117.89***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.56	0.57	0.57	0.65
Obs	2675	2451	2451	668

Table 4 runs the baseline model separately for firms high and low information asymmetries. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Panel A and Panel B both incorporate syndicate-lead formation and performance pricing provisions and Panel C incorporates the composite measure of syndicate-level risk mitigating factors into the

model. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for $p < 10\%$, ** is used for $p < 5\%$ *** is used for $p < 1\%$ significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

Table 5

The Effects of Bank Risk Mitigation Mechanisms on Tax Avoidance and Syndicate Loan Spreads

Panel A: Number of Lead Agents

Variables	CETR	BTD	PBTD	DTAX
TAX	70.93***	213.61***	166.86**	40.76
	(0.00)	(0.00)	(0.01)	(0.25)
NLD	-21.22***	-8.14*	-9.52**	-9.41**
	(0.00)	(0.06)	(0.02)	(0.03)
$NLDTAX$	-30.77**	-158.36**	-165.41**	-30.73
	(0.04)	(0.01)	(0.04)	(0.37)
$Constant$	194.83***	192.29***	189.20***	206.61***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.51	0.52	0.51	0.51
Obs	6456	5878	5878	4457

Panel B: Performance Pricing Provisions

Variables	CETR	BTD	PBTD	DTAX
TAX	72.34***	123.60***	58.88	16.02**
	(0.00)	(0.00)	(0.38)	(0.04)
PPP	-51.58***	-37.15***	-38.18***	-35.78***
	(0.00)	(0.00)	(0.00)	(0.00)
$PPPTAX$	-53.15***	-16.86	38.31	-5.79
	(0.00)	(0.78)	(0.61)	(0.67)
$Constant$	195.10***	193.89***	188.77***	174.22***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.51	0.52	0.51	0.51
Obs	6456	5878	5878	4457

Panel C: Composite Measure of Syndicate-Level Risk Mitigation

Variables	CETR	BTD	PBTD	DTAX
TAX	63.96***	142.40***	66.36	13.40
	(0.00)	(0.00)	(0.22)	(0.17)
CRM	-31.94***	-14.3111***	-17.59***	-16.77***
	(0.00)	(0.00)	(0.00)	(0.00)
$CRMTAX$	-52.92***	-141.44**	-33.29	10.74
	(0.00)	(0.01)	(0.90)	(0.35)
$Constant$	180.23***	176.44***	172.71***	197.93***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.48	0.49	0.48	0.48
Obs	6456	5878	5878	4457

Table 5 runs the augmented model that controls for the effectiveness of risk loan-specific risk-mitigating factors in alleviating ex-ante risks related to tax avoidance. Panel A and B use the number of lead agents and performance pricing provisions as two syndicate-level risk mitigating mechanisms respectively. Panel C adds the composite measure of syndicate-level risk management mechanisms to the model. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for p < 10%, ** is used for p < 5% *** is used for p < 1% significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

Table 6
Bank Risk Mitigation and Cost of Tax Avoidance for Financially Constrained Firms

Panel A: Number of Lead Agents

	Non-Investment Grade Firms				Investment Grade Firms			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	68.10***	209.39***	199.91***	29.38	48.98	187.58	17.04	46.70
	(0.00)	(0.00)	(0.00)	(0.18)	(0.12)	(0.24)	(0.87)	(0.30)
NLD	-17.89***	-7.16	-8.30*	-8.00*	-11.36	3.20	-0.76	-1.86
	(0.00)	(0.13)	(0.08)	(0.10)	(0.29)	(0.74)	(0.92)	(0.54)
$NLDTAX$	-23.57*	-142.36*	-151.95*	-25.81	-34.02	-169.10	-68.43	-35.41
	(0.06)	(0.05)	(0.10)	(0.27)	(0.30)	(0.30)	(0.54)	(0.44)
$Constant$	173.74***	172.16***	168.61***	194.33***	115.21*	124.69*	117.34*	112.23
	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)	(0.09)	(0.10)	(0.12)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.48	0.49	0.49	0.48	0.49	0.48	0.48	0.47
Obs	5066	4580	4580	3454	1390	1268	1269	1003

Panel B: Performance Pricing Provisions

	Non-Investment Grade Firms				Investment Grade Firms			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	83.07***	155.54***	134.85	2.29	20.06	-1.25	-72.31	22.58*
	(0.00)	(0.00)	(0.11)	(0.78)	(0.15)	(0.98)	(0.18)	(0.05)
PPP	-60.26***	-39.19***	-40.48**	-39.53***	-15.48***	-24.00***	-20.91***	-16.73***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$PPPTAX$	-73.19***	-60.70	-20.46	47.53	7.84	176.22	150.75	-37.19***
	(0.00)	(0.37)	(0.83)	(0.16)	(0.67)	(0.11)	(0.12)	(0.00)
$Constant$	178.29***	174.49***	167.62***	193.56***	105.99***	125.81*	117.95*	112.67
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.10)	(0.12)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.49	0.49	0.49	0.48	0.48	0.48	0.48	0.47
Obs	5066	4609	4609	3454	1390	1268	1269	1003

Panel C: Composite Measure of Syndicate-Level Risk Mitigation

	Non-Investment Grade Firms				Investment Grade Firms			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	68.59***	160.48***	111.15	7.85	16.51	34.77	-70.79	15.18
	(0.00)	(0.00)	(0.12)	(0.34)	(0.14)	(0.65)	(0.16)	(0.42)
CRM	-36.65***	-14.20***	-18.24**	-16.85***	-11.51**	-10.26**	-11.97**	-9.74***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.01)	(0.01)	(0.00)
$CRMTAX$	-69.70***	-163.27**	-42.73	29.51	-1,27	-19.82	37.21	-5.12
	(0.00)	(0.02)	(0.66)	(0.25)	(0.94)	(0.83)	(0.50)	(0.81)
$Constant$	162.98***	158.17***	154.05***	182.41***	61.39	75.57	71.62	92.69
	(0.00)	(0.00)	(0.00)	(0.00)	(0.32)	(0.30)	(0.30)	(0.20)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.45	0.46	0.45	0.44	0.48	0.47	0.47	0.46
Obs	5066	4609	4609	3454	1390	1269	1269	1003

Table 6 runs the augmented model that tests for the effectiveness of risk loan-specific risk-mitigating factors in alleviating ex-ante risks related to tax avoidance separately for firms with and without financial constraints. Panel A and B use the number of lead agents and performance pricing provisions as two syndicate-level risk mitigating mechanisms respectively. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for p < 10%, ** is used for p < 5% *** is used for p < 1% significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

Table 7
Bank Risk Mitigation and Cost of Tax Avoidance for Firms with Information Asymmetries

Panel A: Number of Lead Agents

	High-Information Asymmetries				Low-Information Asymmetries			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	67.91***	211.00***	231.48***	56.02	84.93***	216.21*	57.72	47.21
	(0.00)	(0.00)	(0.00)	(0.29)	(0.00)	(0.06)	(0.60)	(0.20)
NLD	-16.02**	-5.91	-8.16	-6.14	-28.37***	-10.77*	-11.76*	-9.79***
	(0.02)	(0.29)	(0.13)	(0.39)	(0.00)	(0.10)	(0.6)	(0.00)
$NLDTAX$	-19.73	-163.12**	-152.70	-38.39	-47.39	-140.52	-121.52	-34.23
	(0.28)	(0.04)	(0.22)	(0.47)	(0.13)	(0.23)	(0.31)	(0.36)
$Constant$	213.21***	215.80***	213.00***	186.16***	183.84***	159.41***	148.34***	209.93***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.48	0.48	0.48	0.50	0.57	0.58	0.58	0.49
Obs	3781	3397	3397	1715	2675	2451	2451	3789

Panel B: Performance Pricing Provisions

	High-Information Asymmetries				Low-Information Asymmetries			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	88.71***	147.69**	207.88**	23.36*	51.86***	91.93	-79.03	8.81
	(0.00)	(0.02)	(0.04)	(0.10)	(0.00)	(0.13)	(0.25)	(0.45)
PPP	-61.42***	-41.06***	-40.69**	-37.00***	-32.65***	-29.02	-29.89***	-22.26***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$PPPTAX$	-73.36***	-48.32	-98.31	-3.09	-20.26	65.17	159.88	-45.22
	(0.00)	(0.53)	(0.37)	(0.88)	(0.31)	(0.43)	(0.14)	(0.02)
$Constant$	220.71***	218.94***	212.65***	208.62***	167.68***	154.96***	147.88	174.33**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.48	0.48	0.48	0.49	0.57	0.58	0.58	0.66
Obs	3781	3397	3397	3789	2675	2451	2451	66668

Panel C: Composite Measure of Syndicate-Level Risk Mitigation

	High-Information Asymmetries				Low-Information Asymmetries			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	71.11***	160.90***	172.54**	22.40	53.08***	115.54	-70.94	-11.85*
	(0.00)	(0.00)	(0.22)	(0.10)	(0.00)	(0.20)	(0.31)	(0.10)
CRM	-36.55***	-16.00***	-18.21**	-17.81***	-25.80***	-16.38***	-20.83***	-18.31***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$CRMTAX$	-63.22***	-159.53*	-98.71	9.23	-31.64*	-61.97	117.63	25.16
	(0.00)	(0.06)	(0.41)	(0.73)	(0.08)	(0.36)	(0.17)	(0.15)
$Constant$	216.37***	219.08***	208.36***	207.72***	151.24***	138.98***	132.88***	141.29***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.44	0.44	0.44	0.46	0.56	0.57	0.57	0.65
Obs	3781	3397	3397	3789	2675	2451	2451	668

Table 7 runs the augmented model that tests for the effectiveness of composite measure for loan-specific risk-mitigating factors in alleviating ex-ante risks related to tax avoidance separately for firms high and low information asymmetries. Panel A and B use the number of lead agents and performance pricing provisions as two syndicate-level risk mitigating mechanisms respectively. Panel C uses the composite risk mitigation measure. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for p < 10%, ** is used for p < 5% *** is used for p < 1% significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

Table 8

Bank Risk Mitigation and Cost of Tax Avoidance – Control for Self-Selection via PSM

Panel A: Self-selection into Loans with Greater Number of Lead Agents

Variables	CETR	BTD	PBTD	DTAX
TAX	68.95***	200.96***	152.57**	40.08
	(0.00)	(0.00)	(0.02)	(0.24)
$NOLEAD$	-21.63***	-7.05*	-8.07*	-7.91*
	(0.00)	(0.10)	(0.06)	(0.08)
$NOLEADTAX$	-37.90***	-154.72**	-184.66*	-33.18
	(0.00)	(0.03)	(0.05)	(0.33)
$Constant$	194.85***	194.28***	191.28***	220.23***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.51	0.52	0.52	0.51
Obs	5114	4595	4595	3568

Panel B: Self-selection into Loans with Performance Provision Clauses

Variables	CETR	BTD	PBTD	DTAX
TAX	81.00***	126.91***	34.67	10.87*
	(0.00)	(0.00)	(0.66)	(0.08)
PPP	-53.41***	-36.64***	-38.44***	-39.87***
	(0.00)	(0.00)	(0.00)	(0.00)
$PPPTAX$	-59.97***	-47.57	29.44	-5.36
	(0.00)	(0.44)	(0.73)	(0.67)
$Constant$	188.03***	186.08***	181.07***	193.43***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.51	0.51	0.51	0.50
Obs	4338	3898	3898	3012

Panel C: Self-selection into Loans with Complete Set of Risk Mitigation Mechanism (CSR)

Variables	CETR	BTD	PBTD	DTAX
TAX	89.27***	191.21**	48.19	31.55
	(0.00)	(0.01)	(0.59)	(0.73)
CRM	-36.65***	-15.25***	-20.42***	-15.29***
	(0.00)	(0.00)	(0.00)	(0.00)
$CRMTAX$	-62.40***	-175.12**	-13.51	47.69
	(0.00)	(0.03)	(0.89)	(0.64)
$Constant$	142.30***	114.08***	114.16***	146.44***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.50	0.49	0.49	0.51
Obs	2580	2354	2354	1758

Table 8 runs the augmented model that tests for the effectiveness of risk loan-specific risk-mitigating factors in alleviating ex-ante risks related to tax avoidance for "propensity score matched" samples. Panel A and B use the number of lead agents and performance pricing provisions as two syndicate-level risk mitigating mechanisms respectively. Panel C adds the composite measure of syndicate-level risk management mechanisms to the model. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for p < 10%, ** is used for p < 5% *** is used for p < 1% significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

Table 9

Bank Risk Mitigation and Cost of Tax Avoidance for Financially Constrained Firms 1 - Control for Self-Selection via PSM

Panel A: Self-selection into Loans with Greater Number of Lead Agents

	Non-Investment Grade Firms				Investment Grade Firms			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	66.00***	194.05***	182.99**	28.80	49.89	196.31	8.56	46.84
	(0.00)	(0.00)	(0.01)	(0.18)	(0.12)	(0.23)	(0.94)	(0.42)
NLD	-18.78***	-5.99	-7.12	-6.59**	-9.81	2.82	-0.57	-2.31
	(0.00)	(0.22)	(0.14)	(0.20)	(0.38)	(0.80)	(0.94)	(0.76)
$NLDTAX$	-32.34*	-143.22*	-152.65*	-21.75	-28.31	-152.16	-74.89	-49.53
	(0.07)	(0.07)	(0.10)	(0.34)	(0.41)	(0.39)	(0.53)	(0.38)
$Constant$	168.33***	169.10***	166.06***	210.56***	124.74***	135.09	123.10	114.72***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.50)	(0.60)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.49	0.50	0.49	0.48	0.45	0.45	0.44	0.44
Obs	4116	3706	3706	2858	998	897	897	710

Panel B: Self-selection into Loans with Performance Provision Clauses

	Non-Investment Grade Firms				Investment Grade Firms			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	88.35***	157.90**	124.16	11.24	34.05*	5.23	-102.35	3.07
	(0.00)	(0.04)	(0.22)	(0.21)	(0.06)	(0.95)	(0.16)	(0.74)
$PPPD$	-61.10***	-39.29***	-40.89**	-44.60***	-19.30***	-23.48***	-21.14***	-13.81***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$PPPDTAX$	-73.52***	-80.84	-37.61	24.49	-6.61	142.36	139.28	-19.02*
	(0.00)	(0.25)	(0.92)	(0.78)	(0.77)	(0.22)	(0.14)	(0.07)
$Constant$	174.20***	172.02***	164.83***	179.02***	66.44	79.25	69.62	99.83
	(0.00)	(0.00)	(0.00)	(0.00)	(0.44)	(0.41)	(0.47)	(0.27)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.48	0.49	0.49	0.47	0.40	0.42	0.42	0.48
Obs	3481	3120	3120	2412	857	778	778	600

Panel C: Self-selection into Loans with Complete Set of Risk Mitigation Mechanism (CSR)

	Non-Investment Grade Firms				Investment Grade Firms			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	103.01***	162.59	116.94**	-11.11	31.83	191.26	-66.94	10.31
	(0.00)	(0.12)	(0.43)	(0.23)	(0.12)	(0.07)	(0.31)	(0.15)
CRM	-45.58***	-19.63***	-23.20**	-19.29***	-14.05*	-3.52	-11.77**	-4.20***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.07)	(0.45)	(0.01)	(0.00)
$CRMTAX$	-84.52***	-155.35*	-57.08	34.34	-17.35*	-173.53	112.84	10.32
	(0.00)	(0.16)	(0.70)	(0.15)	(0.45)	(0.15)	(0.18)	(0.28)
$Constant$	110.13***	71.33*	70.98*	91.84**	151.24***	93.98	87.96	79.35
	(0.00)	(0.06)	(0.06)	(0.04)	(0.00)	(0.26)	(0.29)	(0.39)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.49	0.49	0.49	0.49	0.49	0.59	0.48	0.57
Obs	1730	1578	1578	1155	850	776	776	603

Table 9 runs the augmented model that tests for the effectiveness of risk loan-specific risk-mitigating factors in alleviating ex-ante risks related to tax avoidance for "propensity score matched" samples. The analysis is run separately for firms with and no financial constraints. Panel A and B use the number of lead agents and performance pricing provisions as two syndicate-level risk mitigating mechanisms respectively. Panel C adds the composite measure of syndicate-level risk management mechanisms to the model. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for p < 10%, ** is used for p < 5% *** is used for p < 1% significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

Table 10

Bank Risk Mitigation and Cost of Tax Avoidance for Firms with Information Asymmetries - Control for Self-Selection via PSM

Panel A: Self-selection into Loans with Number of Lead Agents

	High-Information Asymmetries				Low-Information Asymmetries			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	64.18***	202.13***	217.09**	47.86	88.80	216.40	48.53	-49.3111
	(0.00)	(0.00)	(0.01)	(0.20)	(0.12)	(0.07)	(0.66)	(0.26)
NLD	-17.06**	-5.81	-7.95	-9.10*	-27.81	-10.07	-10.22	-5.00
	(0.02)	(0.29)	(0.21)	(0.06)	(0.00)	(0.15)	(0.12)	(0.73)
$NLDTAX$	-28.26*	-172.82**	-177.28*	-36.72	-52.09	-103.44	-118.48	27.83
	(0.10)	(0.03)	(0.20)	(0.33)	(0.10)	(0.41)	(0.36)	(0.52)
$Constant$	201.67***	214.44***	211.58***	226.93***	177.20***	154.24	141.55	235.20***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.49	0.49	0.49	0.49	0.57	0.59	0.58	0.68
Obs	3360	3005	3005	3213	1754	1598	1598	355

Panel B: Self-selection into Loans with Performance Provision Clauses

	High-Information Asymmetries				Low-Information Asymmetries			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	89.73***	168.64**	114.64	15.11	63.90***	37.10	-37.84	8.20
	(0.00)	(0.01)	(0.35)	(0.03)	(0.00)	(0.95)	(0.60)	(0.46)
$PPPD$	-62.50***	-41.37***	-43.28***	-41.26***	-33.67***	-29.07***	-27.85***	-26.59***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$PPPDTAX$	-71.98***	-9.88	-35.85	2.47	-29.87	89.98	82.56	-39.01**
	(0.00)	(0.26)	(0.78)	(0.88)	(0.18)	(0.26)	(0.40)	(0.02)
$Constant$	211.40***	214.88***	209.00***	210.96***	129.10	108.15	69.62	122.40
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.47)	(0.09)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.47	0.47	0.47	0.48	0.59	0.59	0.59	0.75
Obs	2875	2567	2567	2709	1463	1331	1331	303

Panel C: Self-selection into Loans with Complete Set of Risk Mitigation Mechanism (CSR)

	High-Information Asymmetries				Low-Information Asymmetries			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	131.02***	327.07*	191.54**	8.05	39.7	106.04*	-44.76	59.65
	(0.00)	(0.05)	(0.39)	(0.23)	(0.22)	(0.10)	(0.31)	(0.64)
CRM	-55.04***	-15.55***	-24.02***	-16.52***	-18.45***	-17.10***	-20.84***	-14.12***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$CRMTAX$	-113.00***	-378.45**	-143.23	18.23	0.59	-42.33	99.47	125.46
	(0.00)	(0.03)	(0.53)	(0.37)	(0.98)	(0.56)	(0.22)	(0.47)
$Constant$	161.93***	115.81**	116.03**	138.04**	151.24***	138.98***	75.18***	71.77
	(0.00)	(0.03)	(0.03)	(0.01)	(0.00)	(0.00)	(0.00)	(0.26)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.47	0.46	0.45	0.50	0.60	0.60	0.60	0.68
Obs	1110	1008	1008	1358	1470	1346	1344	400

Table 10 runs the augmented model that tests for the effectiveness of risk loan-specific risk-mitigating factors in alleviating ex-ante risks related to tax avoidance for "propensity score matched" samples. The analysis is run separately for firms with high and low information asymmetries. Panel A and B use the number of lead agents and performance pricing provisions as two syndicate-level risk mitigating mechanisms respectively. Panel C adds the composite measure of syndicate-level risk management mechanisms to the model. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for p < 10%, ** is used for p < 5% *** is used for p < 1% significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

Table 11
Cost of Tax Avoidance for Firms with No Public Debt vs Firms with Simultaneously Outstanding Public Debt

Panel A: Cost of Syndicated Loans for Firms with No Outstanding Public Debt

Variables	CETR	BTD	PBTD	DTAX
TAX	60.09***	148.76***	131.31*	25.59**
	(0.00)	(0.00)	(0.09)	(0.01)
$NOLEAD$	-14.48	-13.03	-12.90	-8.17*
	(0.00)	(0.00)	(0.25)	(0.09)
PPP	-39.15***	-37.79***	-37.66***	-36.20***
	(0.00)	(0.00)	(0.00)	(0.00)
$Constant$	182.01*	184.77***	179.85***	185.72***
	(0.07)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.50	0.50	0.49	0.48
Obs	5098	4623	4623	3588

Panel B: Risk Mitigation via Reputation Acquisition for Firms with Public Debt

Variables	CETR	BTD	PBTD	DTAX
TAX	59.18***	162.79***	136.28**	26.80**
	(0.00)	(0.00)	(0.02)	(0.01)
$BOND$	-5.81	6.46**	6.85**	0.36
	(0.26)	(0.04)	(0.03)	(0.90)
$BONDTAX$	-31.16**	-209.55***	-330.67***	-25.81**
	(0.04)	(0.00)	(0.00)	(0.03)
$Constant$	193.13***	190.36***	187.84***	206.50***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.51	0.52	0.51	0.51
Obs	6456	5848	5848	4457

Panel C: Self-Selection into Public Debt Financing

Variables	CETR	BTD	PBTD	DTAX
TAX	59.55***	164.68**	95.44**	17.45
	(0.00)	(0.03)	(0.02)	(0.24)
$BOND$	-7.78	2.46	3.38**	-2.76
	(0.18)	(0.49)	(0.02)	(0.42)
$BONDTAX$	-30.65*	-160.86*	-273.76**	-14.84*
	(0.10)	(0.05)	(0.01)	(0.05)
$Constant$	176.57***	165.09***	161.51***	199.78***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.55	0.56	0.56	0.57
Obs	2716	2447	2447	1734

Table 11 tests for the effectiveness of simultaneous access to bond markets in alleviating ex-ante risks related to tax avoidance. Panel A runs the baseline model (eq. (1)) for firms with no outstanding public debt. Panel B and Panel C run equation (3) and control for firms with access to public debt markets and self-selection into public debt financing using propensity score matching, respectively. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for $p < 10\%$, ** is used for $p < 5\%$ *** is used for $p < 1\%$ significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

Table 12
The Combined Effects of Syndicate Risk Mitigation and Public Debt Market Access on the Cost of Tax Avoidance

Panel A: Number of Lead Agents and Bond Ownership

Variables	CETR	BTD	PBTD	DTAX
TAX	72.86***	225.97***	202.10**	59.08
	(0.00)	(0.00)	(0.00)	(0.14)
$BOND$	-4.02	5.35*	6.47**	0.31
	(0.41)	(0.09)	(0.04)	(0.92)
$BONDTAX$	-23.55	-170.39***	-305.89***	-29.92
	(0.14)	(0.00)	(0.00)	(0.4)
NLD	-20.21***	-9.20***	-10.26***	-9.46**
	(0.00)	(0.00)	(0.00)	(0.03)
$NLDTAX$	-26.55*	-117.70*	-124.48*	-36.59
	(0.08)	(0.07)	(0.10)	(0.30)
$Constant$	196.57***	189.92***	188.35***	208.74***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.51	0.51	0.51	0.51
Obs	6456	5848	5848	4457

Panel B: Performance Pricing Provisions and Bond Ownership

Variables	CETR	BTD	PBTD	DTAX
TAX	80.03***	160.88***	126.32*	27.79*
	(0.00)	(0.00)	(0.07)	(0.07)
$BOND$	-6.84	6.51**	6.83**	0.34
	(0.16)	(0.04)	(0.03)	(0.91)
$BONDTAX$	-36.60**	-210.34***	-329.29***	-25.92**
	(0.02)	(0.00)	(0.00)	(0.03)
PPP	-52.17***	-37.61***	-37.81***	-35.87***
	(0.00)	(0.00)	(0.00)	(0.00)
$PPPTAX$	-55.76***	5.38	26.30	-6.63
	(0.00)	(0.92)	(0.72)	(0.61)
$Constant$	198.62***	190.31***	187.89***	206.56***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.51	0.52	0.51	0.51
Obs	6456	5848	5848	4457

Panel C: Composite Measure of Syndicate-Level Risk Mitigation and Bond Ownership

Variables	CETR	BTD	PBTD	DTAX
TAX	65.35***	177.73***	136.81**	25.58
	(0.00)	(0.00)	(0.02)	(0.10)
$BOND$	-4.77	5.60*	6.74**	1.34
	(0.32)	(0.08)	(0.03)	(0.66)
$BONDTAX$	-26.48	-184.57***	-332.62***	-23.76*
	(0.09)	(0.00)	(0.00)	(0.08)
CRM	-0.99*	-11.11***	-0.14***	-16.75***
	(0.82)	(0.00)	(1.00)	(0.00)
$CRMTAX$	-42.57***	-80.64*	-40.47***	6.29
	(0.00)	(0.10)	(0.00)	(0.62)
$Constant$	193.00***	188.69***	186.60***	200.00***
	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes
R^2	0.51	0.52	0.52	0.48
Obs	6456	5848	5848	4457

Table 12 tests for the simultaneous effects of public bond market access and syndicate-level risk management mechanisms on alleviating ex-ante risks related to tax avoidance. Panel A and B use the number of lead agents and performance pricing provisions as two syndicate-level risk mitigating mechanisms respectively whereas Panel C use the composite measure of syndicate-level risk management mechanisms. Bond ownership is a fix control in both panels. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for $p < 10\%$, ** is used for $p < 5\%$ *** is used for $p < 1\%$ significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

Table 13
Comparison of the Effects of Tax Avoidance on Cost of Public Debt

	Cost of Public Debt				Cost of Public Debt with High Yield Status			
Variables	**CETR**	**BTD**	**PBTD**	**DTAX**	**CETR**	**BTD**	**PBTD**	**DTAX**
TAX	60.89**	-14.68	-49.36	-33.26	15.43	-114.03	-186.99	96.67
	(0.04)	(0.90)	(0.66)	(0.22)	(0.70)	(0.36)	(0.26)	(0.78)
HYB					33.14*	0.016	3.36	-20.79
					(0.08)	(0.99)	(0.92)	(0.49)
$HYBTAX$					108.05*	403.68	680.61*	-282.54
					(0.07)	(0.13)	(0.07)	(0.63)
$Constant$	301.94***	282.56***	287.41***	228.00**	285.16***	273.69***	282.34***	250.22***
	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)
$Industry\ \&\ Time\ FE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.17	0.17	0.17	0.20	0.18	0.18	0.18	0.20
Obs	2430	2207	2207	740	2430	2207	2207	740

Table 13 tests for the effectiveness of simultaneous access to bond markets in alleviating ex-ante risks related to tax avoidance for the total sample. For each model, the dependent variable TAX represents one of the four tax avoidance proxies (CETR, TBTD, PBTD and DTAX) used in the analysis. Calculation of all of these tax avoidance measures alongside with control variables are detailed in Appendix A. Asterisks above the coefficients represent significance levels where * is used for p < 10%, ** is used for p < 5% *** is used for p < 1% significance levels. All p-values are two-tailed and are reported in parentheses. Standard errors are clustered by firm and all regressions include industry (2-digit SIC) effects and time fixed effects.

APPENDIX A
Variable Definitions

Tax Planning Measures	
CETR	=The ratio of cash taxes paid (Compustat: TXPD) to pre-tax income adjusted for special items [Compustat: $(TXPD)/(PI - SPI)$]. For the purposes of the cost of equity analysis this measure is multiplied by (-1) so that an increase in the measure reflects increased tax avoidance. The measure is truncated at [0,1] interval
DTAX	=DTAX is calculated as in Frank et al. (2009). The measure is winsorized at the 1st and the 99th percentiles.
BTD	=Total book-tax difference, calculated as the difference between book income adjusted for special items and taxable income scaled by total assets. [Compustat: $(PI - SPI) - (TXFED + TXFO)/STR$], where STR is the statutory tax rate (35%).
PBTD	=Permanent book-tax difference, calculated as the difference between book-tax differences and temporary book tax differences. [$BTD - Compustat$: $(TXDI/STR)$], where STR is the statutory tax rate (35%) and TXDI is the deferred tax expense.
Loan Specific Variables	
SPREAD	= Loan spread required by banks obtained from Thomson Deals database.
NLD	= Dummy indicator which takes the value 1/(0) if the loan facility has greater/(less) than median number of lead arrangers and controls for syndicate-lead-level risk diversification
PPP	= Dummy indicator for loans that include performance pricing provisions.
COV	= The number of covenants included in a loan.
LEADPCT	= The proportion of loan held by the syndicate arrangers. Unlike the past research (e.g., Sufi, 2007), the measure aims to capture the total portion of loan held by the lead agents altogether. Therefore, if four lead arrangers hold half of the total loan amount altogether that is the ratio I use in LEADPCT and not 12.5 percent (50%/4) for each lead bank.
LREP	= Lead arranger reputation. I classify top five syndicate arrangers per given year in Thomson Deals database as the most reputable lenders. Next, I identify loans with the number of reputable lenders in the top quartile of the total sample distribution (LREP).
TERM	=Average loan maturity.
LNLOAN	=Natural logarithm of the outstanding loan amount
REVD	=Dummy indicator that takes the value of 1 if the loan is a revolving credit facility and 0 otherwise.
SECUR	= Dummy indicator that takes the value of 1 if the loan is secured via collateral and 0 otherwise.
Governance Variables	
INOWN	=Percentage of institutional ownership obtained from Thomson Institutional Holdings database.
ANFLW	=The number of analysts following the firm. Obtained from IBES summary files.
Other Control Variables	
PTROA	=Total Pre-tax Income (Compustat: PI) divided by total assets (Compustat: AT).
LNTA	=Natural logarithm of total assets.
PIFO	=Pre-tax income from foreign operations (Compustat: PIFO) divided by total assets.
LVRG	=Long-term debt (Compustat: DLTT) divided by total assets.

PPE	=Net property, plant and equipment (Compustat: PPENT) scaled by total assets.
CISD	=Four-quarter moving average of the spread of commercial and industrial loan rates (loans worth more than $1MN) over the federal fund rates.
AQ	=Following Cook et al. (2015), accrual quality is calculated as the standard deviation of the firm-level residuals as in Francis et al. (2005) from the following model. $$TCA = CFO_{t-1} + CFO_t + CFO_{t+1} + \Delta SALE + PPEGT + \varepsilon$$ In the above model total current accruals TCA is estimated as [Compustat: $\Delta ACT - \Delta LCT - \Delta CHE + \Delta DLC$]. CFO is income before extraordinary items (Compustat: IB) minus total current accruals minus depreciation and amortization (Compustat: DP). All variables are scaled by total assets. The model is estimated for each 2 digit SIC code with 15 or more observations.
FCR	= Dummy indicator that takes the value of 1 if the firm has investment-grade credit rating and 0 otherwise.
MTB	= The ratio of market value of equity [Compustat: $PRCC\_F \times CSHO$] to book value of equity [Compustat: CEQ].

APPENDIX B

Propensity Score Matching

Panel A: Logistic Regressions

Variables	NLD	PPP	CRM
NLD		-0.048	
		(0.41)	
$NOPART$	0.61***	0.60***	
	(0.00)	(0.00)	
PPP	-0.09		
	(0.14)		
$LEADPCT$	-7.01***	-0.25***	
	(0.00)	(0.00)	
$LREP5$	0.73***	-0.13***	
	(0.00)	(0.00)	
$TERM$	0.03*	0.01	0.05***
	(0.08)	(0.23)	(0.00)
$REVD$	0.72***	0.11**	0.43***
	(0.00)	(0.02)	(0.00)
$SECUR$	0.06	-0.024	-0.018
	(0.31)	(0.49)	(0.65)
$LNLOAN$	-0.13**	0.08***	0.43***
	(0.00)	(0.00)	(0.00)
$LNTA$	-0.21***	-0.19***	-0.04*
	(0.00)	(0.00)	(0.10)
$PTROA$	-0.05	-0.16	-0.25
	(0.90)	(0.55)	(0.42)
$LVRG$	-0.34**	0.017	0.12
	(0.03)	(0.88)	(0.33)
AQ	-2.88***	-0.49	-0.68
	(0.00)	(0.52)	(0.43)
PPE	0.13*	-0.07	-0.03
	(0.08)	(0.17)	(0.56)
$INOWN$	0.46***	0.03	0.04
	(0.00)	(0.41)	(0.49)
$ANFLW$	-0.01**	-0.01***	0.01***
	(0.04)	(0.00)	(0.00)
CIS	0.18***	-0.84***	-0.35***
	(0.00)	(0.00)	(0.00)
FCR	0.11	0.06	-0.07
	(0.16)	(0.25)	(0.15)
$Pseudo\ R^2$	0.67	0.51	0.13
$Untreated$	2557	4287	5166
$Treated$	3899	2169	1290

Table above presents the results of the logistic regression analysis as part of the propensity score matching procedure. Column 1 and Column 2 present logistic regression results for the syndicate-lead size (NLD) and performance pricing provision (PPP) variables. Column 3 present logistic regression results for the composite syndicate-level risk mitigation (CRM) variable. The matching technique used is the nearest neighbor matching. Asterisks above the coefficients represent significance levels where * is used for p < 10%, ** is used for p < 5% *** is used for p < 1% significance levels.