



Essays on firms' dept choice : new perspectives

Wajih Abbassi

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ESSAYS ON FIRMS' DEBT CHOICES : NEW PERSPECTIVES

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ESSAYS ON FIRMS' DEBT CHOICES: NEW PERSPECTIVES

Abstract

This thesis investigates the determinants of corporate debt choice through three separate but interconnected essays. The first essay examines the relationship between corporate social responsibility (CSR) and bond debt issuance. Using a panel of 19,208 listed companies across 40 countries and over the period 2003 to 2016, we find that firms with higher CSR performance are more prone to substitute bank loans with bond issuance. We show that as CSR performance improves, it becomes less likely that managers will engage in fraudulent activities that could damage the good reputation long built by the company through its CSR commitment, which makes worthless the scrutiny of banks' monitoring. This observation becomes more obvious during the 2008-2009 crisis when the reputation of firms becomes crucial in a turbulent context where confidence in the financial markets has been seriously shaken. Results hold after conducting a series of robustness tests, including endogeneity, use of alternative regression techniques, and a cross-sectional heterogeneity analysis at the country level.

The second essay links the firm's financial statements comparability with debt choice. We hypothesize that an enhanced comparability is likely to reduce information asymmetry hence allows bondholders to effectively collect and compare data for various firms. Therefore, we expect that more comparable disclosures offsets bank's informational advantages over bondholders encouraging firms to finance their needs with public debt instead of banks loans. Using a sample of 14,872 firm-year observations over the period 2001-2018, we lend support to our hypothesis and find a positive and significant relationship between the firm's financial statements comparability and the proportion of public debt to total debt. These findings remain robust after controlling for within-firm financial reporting quality. We show that inference from our analysis unaffected when alternative regression models are employed. We also show that our findings are not driven by endogeneity problem. Cross-sectional analyses show that positive relationship between comparability and

public debt is more pronounced for informationally opaque and financially constrained firms.

Finally, the third essay examines the association between the readability of firms' narrative disclosures and the debt choice decisions. We expect enhanced readability will help alleviate concerns about information asymmetry implying firms to substitute away from less information-sensitive debt instruments, i.e., banks' loans, to more information-sensitive ones, i.e., public debt. Using a sample of 16,532 firm-year observations spanning 2001-2018, we document a negative and significant association between the readability of a firm's narrative disclosures and its reliance on bank loans. Our findings remain robust after controlling for alternative readability metrics, additional control variables, and alternative regression specifications. Additionally, we demonstrate that endogeneity concerns shall not compromise the validity of our inferences.

Résumé de la thèse

Cette thèse étudie les déterminants du choix de la dette des entreprises à travers trois essais distincts mais interconnectés. Le premier essai examine la relation entre la responsabilité sociale des entreprises (RSE) et l'émission d'obligations. À l'aide d'un panel de 19 208 sociétés cotées dans 40 pays sur la période 2003-2016, nous constatons que les entreprises affichant une performance RSE plus élevée sont plus enclines à émettre des obligations pour se financer. Nous démontrons qu'à mesure que la performance RSE s'améliore, il devient moins probable que les managers s'adonnent à des activités frauduleuses qui pourraient endommager la bonne réputation longuement bâtie par l'entreprise grâce à son engagement sociétal. Ainsi, l'avantage des banques en matière de contrôle des décisions managériales devient moins évident pour ce genre de firmes, ce qui explique un plus grand recours à la dette obligataire. Ce constat devient plus manifeste pendant la crise 2008-2009 où la réputation des firmes devient plus cruciale dans un contexte turbulent où la confiance en les marchés financiers s'est sérieusement ébranlée. Les résultats demeurent vérifiables après l'application d'une série de tests de robustesse, y compris l'endogénéité, l'utilisation de techniques de régression alternatives et une analyse transversale de l'hétérogénéité au niveau des pays.

Le deuxième essai établit un lien entre la comparabilité des états financiers de l'entreprise et le choix de la dette. Nous émettons l'hypothèse qu'une meilleure comparabilité est susceptible de réduire les asymétries d'information, permettant ainsi aux détenteurs d'obligations de collecter et de comparer plus efficacement les données de diverses entreprises. Par conséquent, nous nous attendons à ce que les avantages informationnels des banques par rapport aux détenteurs d'obligations soient neutralisés, ce qui encourage les entreprises à financer leurs besoins par la dette obligataire. À l'aide d'un échantillon de 14872 observations pour la période 2001-2018 sur le marché américain, nous validons notre hypothèse et constatons une relation positive et significative entre la comparabilité des états financiers de l'entreprise et la proportion de la dette obligataire par rapport à la dette totale. Ces constatations demeurent valides après le contrôle de la qualité des rapports financiers au sein de

l'entreprise. Nous montrons que l'inférence de notre analyse n'est pas affectée lorsque d'autres modèles de régression sont utilisés. Nous montrons également que nos résultats ne sont pas biaisés par un problème d'endogénéité. Les analyses transversales montrent que la relation positive entre la comparabilité et la dette obligataire est plus prononcée pour les entreprises les plus opaques sur le plan de l'information et celles qui sont sujettes à de plus importantes contraintes financières.

Enfin, le troisième essai examine l'association entre la lisibilité des divulgations narratives des entreprises et leurs décisions de choix de la dette. Nous nous attendons à ce que l'amélioration de la lisibilité contribue à atténuer les préoccupations concernant les asymétries d'information. Ceci devrait, à son tour, impliquer que les entreprises remplacent les titres de créance moins sensibles à l'information, c'est-à-dire les prêts bancaires, par des titres plus sensibles à l'information, c'est-à-dire la dette obligataire. À l'aide d'un échantillon de 16 532 observations pour l'exercice 2001-2018 sur le marché américain, nous documentons une association négative et importante entre la lisibilité des divulgations narratives d'une entreprise et son recours aux prêts bancaires. Nos constatations demeurent solides après le contrôle des mesures alternatives de lisibilité, l'ajout de variables de contrôle supplémentaires et l'utilisation d'autres modèles de régression. De plus, nous démontrons que la validité de nos conclusions ne sont pas entachées par des biais dus à l'endogénéité.

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Introduction

Over the last decade, the U.S. capital markets were intensively marked with an elevated level of public debt. As a result, this financing medium emerged as the most attractive long-term financing instrument for publicly traded U.S. companies, as evidenced by the Federal Reserve System's flow of funds data. By the end of 2020, the outstanding debt securities for nonfinancial U.S. corporate business reached 7,198 billion dollars, with a 9.38% increase relative to 2019. This financing option has far exceeded the private financial debt of 3,862 billion dollars, with an 8.8% increase over the same period¹. Nevertheless, in other economies, bank debt is dominated, particularly in Japan and the Euro area. For instance, by the end of 2021 first quarter, bank debt in Japan reached 24.6% of financial liabilities owed by nonfinancial corporate businesses, compared to only 4.4% for public debt. Similarly, the Euro area's bank debt was approximately 27.5% against 4.1% for public debt².

Despite the rising appetite for debt financing and the significant temporal change in firms' debt structure across many countries, researchers could not offer clear explanations for the influential factors and main determinants of private versus public debt preference. In line with this, a substantial body of theoretical literature on financial intermediation suggests that the primary driver of the decision between public and private debt is the information asymmetry issue (Diamond 1984, 1991; Fama, 1985; Boyd and Prescott 1986; Berlin and Loeys, 1988; Hoshi et al., 1993; Nakamura, 1993; Chemmamur and Fulghieri 1994; Denis and Mihov, 2003). In this regard, borrowing firms are more likely to prefer private debt over public debt when they face higher information asymmetries.

Concerning the information asymmetry argument, we identify three sets of debt choice models, (i) the cost of information production, (ii) the proprietary information, and (iii) the moral hazard issues. For the information production argument, previous literature suggests that the firm will bear considerably higher information costs under the public debt alternative since it must comply with stringent SEC rules related to

¹ <https://www.federalreserve.gov/releases/z1/20210923/z1.pdf>

² <https://www.boj.or.jp/en/statistics/sj/sjhiq.pdf>

information disclosures (Blackwell and Kidwell 1988). In this respect, banks offer cost advantages since they have easier access to firms' private information. The bank's informational advantage is presumably more obvious for smaller firms (Fama 1985). Another aspect of the production of information is the banks' ability to accurately assess firms' financial position and weigh banks' claims. Thus, undervalued firms are expected to rely more on banks to finance their needs. By doing so, they try to avoid the adverse selection issues they would face if they chose to access financial markets and issue public debt (Hadlock and James 2002).

On the other hand, the public debt issue requires the divulgence of information considered sensitive and critical for a firm's competitiveness. In such a case, firms will face a dilemma. Shall they disclose their private information to ascertain their creditworthiness to bondholders, or shall they keep it confidential to protect their competitive edge? Strategic information is the laying grounds to tailor good choices between public and private debt (Bhattacharya and Chiesa 1995; Bhattacharya and Ritter 1983; Campbell 1979; Yosha 1995). Consequently, firms with proprietary information expected to generate future earnings and with creative and innovative ideas are inclined to rely more on bank loans (Boone, Floros, and Johnson 2016; Johnson 1997).

The third set of debt choice models are based on moral hazard assumptions. It is argued that managers are tempted to undertake harmful actions toward other stakeholders (Jensen and Meckling 1976; Myers 1977) and that banks are more effective monitors than bond issuers to deter managers' discretionary behavior. Indeed, the moral hazard stipulates that monitoring becomes more efficient when a single player conducts it to avoid free-rider problems and duplicate efforts (Diamond 1984, 1991; Houston and James 1996). Accordingly, bank supervision should help protect lenders' and shareholders' interests by discouraging managers from investing in pet projects or extracting private benefits (Almazan and Suarez 2003; Hoshi, Kashyap, and Scharfstein 1993). In summary, information-based theoretical models of debt choice suggest that public debt pricing is more sensitive to changes in the firm's informational environment. As a result, firms should prioritize less information-

sensitive debt, bank loans, over more information-sensitive debt, public debt, whenever information asymmetry increases.

The empirical evidence for the validity of information-asymmetry-based models is sparse and inconsistent. Houston and James (1996), Johnson (1997), Krishnaswami, Spindt, and Subramaniam (1999), Hadlock and James (2002), and Denis and Mihov (2003) prove these theoretical intuitions by demonstrating that small and medium-sized firms rely more on private debt. In contrast, large firms benefit from public debt's scale economies in information and flotation costs. Similarly, Best and Zhang (1993) document an average positive reaction of the stock market to bank loan announcements, implying that investors who believe that banks are well equipped to determine and assess firm value would mostly favor private debt arrangements. Moreover, Houston and James (1996), Johnson (1997), and Denis and Mihov (2003) find that firms with more fixed assets, i.e., less information asymmetry, rely less on bank loans. From another perspective, Denis and Mihov (2003) use unexpected stock returns and future abnormal earnings to proxy the firm's level of adverse selection but find no evidence with private debt use. Krishnaswami, Spindt, and Subramaniam (1999) document a positive relationship between the market-to-book ratio and the likelihood that firms will rely more heavily on bank loans, which contradicts Hoshi, Kashyap, and Scharfstein (1993) assumption stating that managers of firms with sound projects do not require bank supervision.

This thesis responds to urgent calls to investigate the still unanswered questions about firms' debt alternatives. More specifically, we explore the determinants of debt choice from three different angles that are interconnected with the use of the informational channel. In particular, we test the relationship between the firm's debt choice and its corporate social responsibility (CSR) performance (chapter 2), the comparability of its financial statements (chapter 3), and the readability of its narrative disclosures (chapter 4). The first chapter is devoted, of course, to a review of the previous literature on the said subject.

The first essay, titled "Why do CSR-oriented companies opt for bond debt? Cross-country evidence", investigates the relationship between CSR and bond debt issuance. Using a panel of 19,208 listed companies across 40 countries and over 2003-

2016, we find that firms with higher CSR performance are more prone to substitute bank loans with bond issuance. We demonstrate that many firms, i.e., high-quality and low-quality ones, embrace high CSR performance. High-quality firms are likely to reduce information asymmetry to highlight their CSR commitment and improve their reputational capital. Accordingly, such firms would naturally replace less information-sensitive debt instruments, i.e., bank loans, with more sensitive ones, i.e., public debt.

On the other hand, lower-quality firms are more likely to use their CSR commitment as a smokescreen to hide possible fraudulent behaviors. As a result, such firms are more likely to avoid the scrutiny of banks' monitoring. Results persist after conducting a series of robustness tests, including endogeneity, alternative regression techniques, and a cross-sectional heterogeneity analysis at the country level.

The second essay, titled “Financial Statement Comparability and Firm’s Debt Choice” tests whether the comparability of a firm’s financial statements impacts its debt choice. We develop and investigate two competing hypotheses in linking comparability with debt choice. Using a sample of 14,872 firm-year observations over 2001-2018, we find a positive and significant relationship between the firm’s financial statements comparability and the proportion of bank debt to total debt. These findings remain robust after controlling for within-firm financial reporting quality. We show that inference from our analysis is unaffected when alternative regression models are employed. We also show that the endogeneity problem does not drive our findings. Cross-sectional analyses show a positive relationship between comparability and bank debt is more pronounced for informationally opaque and financially constrained firms.

The third essay, titled “Financial Statement Readability and Firm’s Debt Choice”, explores the association between the readability of firms' narrative disclosures and debt choice decisions. We expect enhanced readability to alleviate concerns about information asymmetries implying firms would substitute less information-sensitive debt instruments, i.e., banks’ loans, with more information-sensitive ones, i.e., public debt. Using a sample of 16,532 firm-year observations spanning over 2001-2018, we document a negative and significant association between

the readability of a firm's narrative disclosures and reliance on bank loans. Our findings remain robust after controlling for alternative readability metrics, additional control variables, and alternative regression specifications. Additionally, we demonstrate that endogeneity concerns did not compromise the validity of our inferences.

This research makes several distinct contributions to the literature. First, it provides further clarification to the ongoing debate on the determinants of the firm's debt choice (e.g., Boubaker, Rouatbi, and Saffar 2017; Boubaker, Saffar, and Sassi 2018; Boubakri and Saffar 2019; Chen, Saffar, and Srinidhi 2018; Li, Lin, and Zhan 2015). Remarkably, this thesis shows that the informational channel remains a crucial factor in shaping the firm's debt choice policy. Second, this study resonates with the consequential effects of two contradictory views of information asymmetries. Indeed, while enhanced informational transparency might be beneficial for some firms by facilitating access to a new source of financing, i.e., public debt, it can be detrimental for other firms by putting them at a competitive disadvantage. Third, the present study expands our understanding of the economic implications of a firm's CSR performance, its financial statements comparability, and its narrative disclosures readability, respectively.

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Chapter I

Literature Review: The Choice between Public and Private Debt

1. Introduction

The choice between public and private debt alternatives remains among the most challenging corporate decisions. The debt choice issue entangles many factors that might be internal, such as the company age, size, sector, growth, creditworthiness, collaterals, and financial strength, or external to the firm, such as laws, culture, financial markets, and political stability. Corporations strive to adopt the most appropriate capital structure policy that increases firm value. Accordingly, firms analyze alternative debt financing possibilities, weigh the risk-return trade-off between public and private debts, and segregate projects with higher returns to pay off the debts and accrued interest (Morellec, Valta, and Zhdanov, 2012). In this regard, firms can use a combination of public and private debts to finance their operating and capital expenditures (Kale and Meneghetti, 2011). However, although such policies are performed at the firm's sole discretion, the corporate quest to find the best financing options remains controversial and conditioned by many endogenous and exogenous factors.

In the present paper, we aim to conduct an in-depth analysis of the existing literature on firms' debt choices from theoretical and empirical perspectives. We provide a thorough understanding of the evolution of the said theories and concepts and emphasize the implication and contribution of related empirical studies. Such a literature enables synthesizing prior findings, building a comprehensive database, and extracting common traits to learn from. It serves to pinpoint corporate' weaknesses and fragilities

and highlight main strengths that can explicate capital structure policies. We allocate special consideration to gathering all theories and underlying methods to elaborate on their connectedness to debt choices' strategies.

We contribute to fostering the understanding of the main drivers of debt choice. We consolidate prior findings and classify inherent models under four research avenues. First, the information-based theory stipulates that the main driver of the debt choice decision is based on three arguments, (i) the information production process, (ii) the proprietary information, and (iii) the moral hazard. Second, the renegotiation and liquidation theory. Third, the theory based on the life cycle of the firm and the credit quality. Finally, we ponder the implications and effects of regulatory and governmental requirements on the firm's debt choice decisions.

The remainder of the paper is structured as follows. Section 2 sheds light on the information-based theory. Section 3 reviews the renegotiation and liquidation theory. Section 4 focuses on the firm's life cycle and credit quality theory. Section 5 analyzes the effects of the regulatory environment on the firm's debt choice. The last section concludes the study and offers new research paths.

2. The information-based theory of private versus public debt

The literature points that banks have an informational advantage compared to public debt holders, and that advantage is likely to get consistent as information asymmetries become more severe. More particularly, the existing literature advances the three following reasons to explain such an advantage. First, the production and disclosure of corporate information remain costly, and various firms prefer to have bank debt over public debt. Indeed, banks produce the desired information at a considerably lower cost because of their direct access to firms' financial transactions as well as their exemption from disclosures regulations imposed upon public debtholders (Fama 1985; James and Smith 2000; Nakamura 1991). In the same vein, banks are more effective in analyzing information and, therefore, in providing a more accurate pricing of firms' claims (Hadlock and James 2002). Second, unlike the public debtors, banks are also ideal

in keeping the firm's sensitive information confidential. Consequently, firms who want to hide their private information to protect their competitive position are more likely to rely more on bank debt (Bhattacharya and Ritter 1983; Yosha 1995). The third element of the information-based theory relates to the moral hazard, which entails the ability of the bank to monitor the managers and firm's owners from making unscrupulous decisions that have the potential to harm the firm and debtors. Indeed, the widespread ownership of public bonds exacerbates free rider issues and diminishes the incentive of individual bondholders to engage in costly monitoring. At the opposite side, banks appear to be more effective monitors thanks to their concentrated ownership of debt claims, providing them with stronger incentives to supervise firms' managers (Diamond 1984, 1991; Houston and James 1996).

2.1. The Costly information production

Firms constantly search to be a reliable source of information without incurring additional costs. When it comes to public debt, the SEC (Securities and Exchange Commission) lays down general requirements for prospective borrowers to issue bonds, notably providing extensive documentation. Firms are required to disclose the information that investors deem necessary prior to invest in these bonds (Blackwell and Kidwell 1988). On the other side, disclosing information to banks is obviously less time-consuming and less costly. Thanks to their access to the firm's accounts, banks can collect critical information (Nakamura 1991). Moreover, when other firm's competitors hold accounts at the same bank, the information can be processed more efficiently through the comparison of the collected data of a given firm with its competitors' performances. As a consequence, small businesses are likely to rely more on bank loans due to the high cost of disclosing the documents required for public debt financing (Fama 1985). Alternatively, Nakamura (1991) advocates that the informational advantage of bank debt is less evident for large enterprises because they are likely to hold numerous accounts typically dispersed among many banks, and therefore each bank has access to only a limited amount of information. Furthermore, Krishnaswami, Spindt, and Subramaniam (1999) argue the advantage of banks' information costs becomes the more valuable when

the information asymmetry is more severe. While Hadlock and James (2002) plead that undervalued firms are likely to substitute away from public to bank debt mainly because banks have the necessary resources to collect and proceed firms' private information, hence correctly price the firm's value.

Empirical evidence corroborates the hypothesis developed so far by the information production models. For instance, prior studies report a positive correlation between the size of the firm and the reliance on public debt financing (Denis and Mihov 2003; Houston and James 1996; Johnson 1997; Krishnaswami, Spindt, and Subramaniam 1999). Furthermore, Li, Lin, and Zhan (2019) support the prediction of Krishnaswami, Spindt, and Subramaniam (1999) and provide evidence that an increase in information asymmetry, measured by a loss in financial analysts following a firm, is associated to a negative bond market reaction and to a more reliance on bank debt financing. In addition Hadlock and James (2002) provide support to their hypothesis that banks have better accuracy in pricing the firms' claims than the public lenders and hence undervalued firms rely more on bank debts. They used the stock prices run-ups and returns' volatility, as measures of undervaluation, to document that undervalued firms are more likely to choose bank loans over public debt.

2.2. The proprietary information

Yosha (1995) explicitly considers that lenders' tight requirements to supply detailed information and ascertain credit rating and worthiness are likely to lead to informational disadvantages associated with the public debt. As such, firms prefer to have bilateral financing contracts and agreements if they have sensitive information they cannot disclose due to the existing competition in the market. Strategic information like firms' research and development, advertisements and marketing approaches are of great value to rivals, and such proprietary information threatens a firm's competitive advantage and unique traits if revealed (Dedman and Lennox 2009; Verrecchia and Weber 2006). On the contrary, access to public debt requires more transparency and a higher level of valuable information to ascertain creditworthiness. Complying with such

requirements can be costly for the firm by weakening its competitive position (Bhattacharya and Ritter 1983; Yosha 1995). Given the foregoing arguments, as well as the pecking order theory, which states that firms use expensive financing only as a "last resort," firms with more sensitive information would rely more on bank debt financing, as banks have greater ability to protect confidential information than public lenders, who require the disclosure of verifiable information as a condition of granting loans (Bae et al. 2020).

The proprietary theory displays various empirical implications where innovative firms tend to have information worth hiding to wade off competition; hence they chose bank loans over public debt. Johnson (1997) provides measurements for the positive information of the firm with the market-to-book ratio. He concludes that the ratio does not significantly determine the firm's debt structure. The model also enhances the prediction that the firm's announcement of bilateral financing agreements and contracts tends to trigger a positive stock market response. Additionally, the announcement acts as a signal that the firm has positive information (Ongena et al. 2014; Ongena and Roscovan 2013; Tampakoudis, Noulas, and Kiosses 2021).

The firm's product market competition is a major constraint for financing options. Indeed, firms with valuable research and development information choose banks instead of public debts. Moreover, this private information implores future organizational earnings, and thus, companies are vigilant to hide and protect it from competitors (Boone, Floros, and Johnson 2016). Consequently, we assume that firms that anticipate higher future earnings embedded in the proprietary information may choose private debt to preserve their competitive advantage.

Moreover, Boubaker, Saffar, and Sassi (2018) argue that firms facing substantial market competition tend to avoid disclosing private information to protect their competitive advantage. Such firms will prefer hide their proprietary information (Verrecchia and Weber 2006) and even bias their disclosures (Bagnoli and Watts 2010) to bluff their competitors. Consequently, firms operating in highly competitive industries

are likely to substitute away from public to private debt (Boubaker, Saffar, and Sassi 2018).

2.3. The moral hazard

The moral hazard emphasizes banks' ability to monitor firms' activities after issuing a loan (Farhi and Tirole, 2012). The company's shareholders or owners may engage in various actions that damage debtholders' reputation and interest, hence the need for close monitoring. This also prevents them from investing in riskier projects since their liabilities are always limited to their shareholding in the firms (Jensen and Meckling 1976). In addition, the banks and other private lending institutions' concentrated holdings and their privileged access to information can exert more pressure and influence on the management (Douma, George, and Kabir 2006).

Moreover, the moral hazard theory postulates that it becomes efficient for a firm with multiple shareholders to be monitored by a single financial intermediary (Diamond 1984). Every investor in the firm develops the incentive to free-ride hence risking the investment made. Banks monitor managerial conduct at a considerably lower cost and higher efficiency compared to the public lenders (Ahn and Choi, 2009). Indeed, financial institutions pull resources from various account holders and lend them to individual firms making it easy to monitor their operations. The model predicts that organizations with higher credit ratings prefer to have bank loans due to lower costs (Arena 2011). According to Besanko and Kanatas (1993), firms need to use debt to finance their activities. In their model, entrepreneurs are considered to have a stake in the firm; hence, they can enhance the project's returns and success by exerting additional efforts. However, the external debts reduce the payoff of the entrepreneurs since they share the return with the various lenders. As a result, shareholders are less incentivized, which leads banks to exert more pressure to keep them working hard (Hoshi, Kashyap, and Scharfstein 1993). Banks also monitor managers to ensure they act for the benefit of both shareholders and lenders. Nonetheless, firms with more tangible assets are expected to rely less on banks' financing, given that their obligations may be offset by their available

assets, which should incentivize the managers undertaking the right decisions to preserve the firms' assets. Such firms with more tangible assets are likely to prefer public debt over banks' loans (Houston and James 1996).

For their part, Almazan and Suarez (2003) explicitly consider the role of separation of management and ownership while choosing between private and public debts. According to their model, managers are the ones who control the decisions related to financing, and owners or shareholders only influence the choices made by the managers by offering them contracts that relate their compensation to the firm's value. The existing conflict between the shareholders and the managers arises because the latter group bears the costs associated with the bank monitoring. In contrast, both managers and the owners split the benefits. They contend that managers of the firm may gain benefits privately at the expense of the shareholders, and this can be controlled well through incentive compensation and monitoring. In the same vein, Hoshi, Kashyap, and Scharfstein (1993) advocate more need for external monitoring to deter managers from fraudulent practices. In such a context, banks have the required profile to provide an effective monitoring and, accordingly, to reduce the moral hazard risk. In a nutshell, firms with more (less) monitoring need are likely to rely more on bank (public) debt financing whenever there is a divergence between ownership and control.

Empirically, Hoshi, Kashyap, and Scharfstein (1993) use Tobin's Q , the market value of the investment opportunity divided by its replacement cost, to investigate the relationship monitoring-debt choice. Empirical evidence shows mixed findings. Firms with high Tobin's Q rely less on bank debt, indicating that such firms need less monitoring because they are expected to earn sufficient payoffs from good investment projects to meet the expectations of both shareholders and managers. The same finding holds for firms with low Tobin's Q , but for different reasons. Indeed, managers get less cash flow from better projects and, accordingly, are more inclined to choose pet projects for their private benefits. In such a context, managers are expected to opt for public debt to avoid banks' monitoring. On the opposite, firms with intermediate Tobin's Q display a higher reliance on bank debt financing. In this case, bank's monitoring will encourage

managers investing more in better projects that will enhance the return to the shareholders and debt holders rather than concentrating on pet projects with low financial payoffs. In another vein, Lin et al. (2013) document that firms controlled by large shareholders are more likely to avoid bank monitoring to preserve their private interests, hence relying more on public debt financing. On the contrary, Boubaker, Rouatbi, and Saffar (2017) report that firms with multiple large shareholders rely more on bank debt suggesting that the presence of these shareholders reduce the controlling owner's incentives to circumvent bank monitoring. In conclusion, bank monitoring remains a crucial mechanism for incentivizing managers to invest in better and more profitable projects.

The audit quality also illustrates the potential effect of information asymmetries on firm's debt choice. Indeed, firms with higher audit quality portray a lower proportion of bank loans and a higher reliance on public debt. The audit quality tends to affect the debt mix, which is stronger among firms with poor governance and increased information asymmetry. Increased level of audit high-quality means that the firm's transparency level increases hence addressing the general public's concerns, which makes it possible for the firm to rely more on public debt. The higher audit quality mitigates the risks associated with the moral hazard involving the shareholders and managers (Chen, Saffar, and Srinidhi 2017). Additionally, high audit standards improve the quality and information content found on the financial statements. Auditors' reports tend to reduce banks' informational advantage over bondholders. Given that bondholders do not possess the ability to monitor the firm's managers after lending their money to the firm, auditors come in to ensure that public interests are accounted for upon harmful decisions (Coffie, Bedi, and Amidu 2018).

3. Efficiency of Renegotiation and Liquidation

Financial flexibility is a pivotal key to firms during their life cycles. According to Roberts and Sufi (2009), various private debt contracts and agreements are renegotiated upon the availability of new information regarding a firm's credit rating. In similar

instances, companies strive to weigh the project's returns against the effective cost of borrowing and remain vigilant about the risk of default and the probability of financial distress and potential liquidation threats (Richardson, Taylor, and Lanis, 2015).

In such context, bank loans are advantageous and superior due to the monitoring effect to manage firms in financial distress and forcing them to renegotiate the loans. Indeed, Sharpe (1990) advocates that banks have more access to their client's information, which allows them to negotiate with firms in financial distress, which reinforces the prediction that banks acquire a bargaining advantage during negotiations that involve firms in financial distress. Thus, private debts become more efficient during liquidation as the banks offer adequate information about the borrowers (Gorton and Kahn 2000). Narrowly, bank debts become more desired in critical times such as financial distress. Moreover, banks are predisposed to establish long-term relationships with their clients while the bondholders do not show the same tendency; hence this latter group is likely to initiate faster liquidation in times of financial distress (Chemmanur and Fulghieri 1994). Therefore, a positive correlation between financial distress and private debt use is expected (Rajan and Winton 1995).

In another setting, Bolton and Freixas (2000) suggest to extend the reasoning to other sources of financing. They pinpoint the need to set an equilibrium structure between external financing sources, i.e., public debts, equity issues, and bank loans. Notwithstanding that banks' debt can be easily restructured, they appear very expensive due to the intermediation costs (Bolton and Freixas 2000). On the contrary, public debts are cheaper but are associated with bankruptcy costs due to default risk and ensuing liquidation cases (Anderson and Sundaresan 1996). In the third case scenario, companies can raise funds through equity issuance. There is no bankruptcy cost in this latter case, but dilution effects interplay and might negatively affect existing shareholders' wealth and firms' value ((Admati et al., 2018; Lucas and McDonald 1990). The trade-off theory explains the need to balance the three financing components within the firm's capital structure. Larger organizations apply a mixture of debts in their capital structure, unlike the smaller firms that solely depend on bank loans (Kurshev and Strebulaev 2015).

In addition, the availability and utilization of various collaterals interfere in the efficiency of the liquidation process, hence, determine the decision of the firms to access public or private debts. Collateral assets involve the physical assets owned by the firms and intangible assets such as research and developments, patented rights, and goodwill. Firms without collateral may find it challenging to secure loans; hence have limited options. Collaterals indicate a firm's ability to raise the needed fund to support business projects with a positive net flow. As the firms become closer to financial distress, their ratio of secured claims tends to increase. Besanko and Thakor (1987) suggest that various collaterals can be considered a measure of quality and are sufficient to reduce creditors' concerns about default risks. Firms with higher collaterals are expected to opt to borrow from banks, given the perceived benefits of doing so. Indeed, banks and other private institutions view the collaterals as enough security to offset the debts should the firm default in paying the principal amounts owed (Berger and Udell 1990; Booth and Booth 2006). Moreover, the collateral constraints imply that the firm's net worth matters since it reflects its financial strength and might thus determine its access to the loans (Agarwal and Hauswald 2008).

At the opposite, Diamond (1993) defends the issuance of public debt. He argues that replacing the short-term private debts by long-term bank loans may be costly since firms cannot evaluate and determine if liquidation will occur or a loan can be rolled over. Utilizing a mixture of debts allows firms to reduce the control exerted by private lenders such as banks, hence avoiding more costly liquidations.

4. Life Cycle of the Firm and the Credit Quality

The corporate debt choices are also affected by the life cycle of the firm and its existing credit quality and rating. Broadly, long-term goals and expansionary projects influence firms' life cycles. Therefore, the management might hugely impact the organization's future by evaluating and considering feasible projects and the availability of different financial outlays. Such projects stem from firms' creditworthiness and

financial power to conduct successful projects, establish higher value, and attract public debts.

The covenants and the close monitoring associated with bank debts tend to reduce the cost of debts for the smaller firms at their early life stages and do not have an established credit quality (La Rocca et al. 2009; Titman and Wessels 1988). Organizations within their early development stages lack the ideal opportunities to establish and build their reputations and thus can only refer to bank loans (Cantillo and Wright 2000). After reaching the peak growth, matured firms can rely on their established public image and credit rating to access public debts. Firms with a longer life cycle have the potential to develop their credit ratings with banks. They hence grow up to a level where the combination of both public and private debts is appropriately implemented (Frost 2007; Kemper and Rao 2013; Pan et al. 2015). In conclusion, the potential growth of the business appears as a crucial factor for debt structure mix, success, and sustainability.

5. Regulatory and governmental requirements

In addition to the factors outlined above, regulations and government policies also play a non-trivial role in conditioning the firm's decision on its sources of debt. This influence, as will be explained below, will affect both the choice of the firm between bank debt and non-bank private debt as well as the choice between private debt and public debt.

5.1. Non-bank private debt versus bank debt

There is a substantial difference between bank and non-bank debts based on the regulatory requirements, placement structures, maturity debtholder's identity, and concentration level. Commonly, a higher portion of the private debts is found under SEC Rule 144A, permitting firms to market their debts to private institutional investments directly. This removes the challenges associated with going through public security issuance that tends to be time-consuming. According to Carleton and Kwan (1995), non-bank loans are relatively liquid and have lower flotation costs relative to issuing public debt. The debt issues found under Rule 144A tend to have a combination of lowly-graded

public debts and bank loans. This feature makes such loans suitable to firms with poor credit ratings. The cost associated with bank monitoring exceeds the benefits for low-quality firms (Diamond 1991).

Rule 144A debtors can evade the day-to-day direct bank influence, avoiding most costs associated with bank loans. Organizations that do not share their valuable information with the public may also opt for the feature despite being valuable and with a good credit rating. The Rule 144A feature offers the debtor greater flexibility when holding renegotiation in default, and the ownership of the non-bank private debt tends to be more concentrated than the public one (Denis and Mihov 2003). Based on the above premises, the riskiest firms with low project quality and higher bankruptcy probability are more likely to refer to non-banks private loans to finance their activities (Arena and Howe 2009). Consequently, similar firms have limited access to both bank and public loans.

5.2. Deregulation and the choice between public and private debts

Deregulation entails a decline in government involvement and is considered a driver for firms' choice between public debt and bank loans. For instance, in Japan, deregulation led to the decline in utilizing bank loans by highly reputable firms (Arikawa 2008). Historically, successful firms are more inclined towards public debt after deregulation. Many firms view government involvement and close bank monitoring as a protective measure to avoid high debt costs and interests (Anderson and Makhija 1999). In the same vein, governments' withdrawal from monitoring and controlling banks' activities contributes to a shift from private to public debt as many firms conceive this strategy as transparent governmental controls over public debt issuance (Anderson and Makhija 1999; Korinek and Kreamer 2014). In parallel, the bond markets have encouraged firms to move from the private sector to the newly established public bond market as their source of borrowing (Schildbach et al. 2013). As a result, deregulation has increased the number of eligible firms to fund their projects by issuing secured and unsecured bonds.

6. Conclusion

The paper offers a succinct analysis of a rich literature that explains firms' policies to issue public or private debts. Various studies emphasize debt choices and offer extensive empirical analyses to explore organizational determinants, driving factors, and regulatory requirements to secure debts like monitoring effect, information asymmetry, confidentiality, moral hazard, deregulation, and debt collaterals.

Our main findings indicate that the debt choice dilemma is still a heavy burden for most companies. Moreover, companies must assess private versus public debt issues regarding many important factors. The production and dissemination of financial information are the most important factors that channel corporate decisions in this context. For instance, proprietary information is a significant constraint to public debt, specifically for innovative and high-tech companies. The firm's industry, capital market, competition, size, life cycle, ownership' structure are the main determinants of private versus public debt choice.

Additionally, the assessment of debt choice might be affected by the potential harmful actions of shareholders. Financial institutions and debt issuers are aware of their reputation and ability to survive. The efficiency of renegotiation and liquidation are also major drivers to choose private versus public debt. In this regard, the company's financial health stands as the main determinant of such strategic choice. Finally, deregulation might be considered a driver for firms' choice between public debts and bank loans. Many firms view government involvement and close bank monitoring as a protective measure to avoid high debt costs.

The study's managerial implications address the importance of conjugating such theoretical and empirical findings to pinpoint common traits that will guide policymakers, managers, creditors, financial institutions, and bankers in lending policies. Debt choice greatly influences firms' debt structure, and cost of capital and thus might fuel its growth prospects and ultimate expansion plans as companies constitute the economy's backbone.

We recommend further studies to combine qualitative and quantitative analysis of factors and drivers of capital structure. Future research should specifically embrace sustainability, governance, environmental, societal, and economic impacts.

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Chapter II

Essay 1: Why do CSR-oriented companies opt for bond debt?

Cross-country evidence

1. Introduction

The firm's debt choice policy is one of the hottest topics in corporate finance, and the quest for the optimal debt level and different debt alternatives remains controversial. However, far from reaching conclusive results, the topic has gained attractiveness due to the substantial impact of the latest contemporary crises. In this regard, scholars have produced extensive theoretical literature on contextual corporate strategies and embedded motives that would channel firms' debt financing alternatives between public (bond issuance) on capital markets and private (bank loans) granted by financial intermediaries (Berlin and Loeys 1988; Boyd and Prescott 1986; Chemmanur and Fulghieri 1994; Denis and Mihov 2003; Diamond 1984; 1991; Fama 1985; Hoshi, Kashyap, and Scharfstein 1993). Nonetheless, due to a lack of data on firms' debt structure, we have recently witnessed many empirical studies on debt choice issues (Shi, Sun, and Zhang 2018; Boubaker, Rouatbi, and Saffar 2017; Boubaker, Saffar, and Sassi 2018; Boubakri and Saffar 2019). What are the main motives for issuing debt on capital markets? What are the main determinants of debt structure?

In the present paper, we attempt to investigate the topic from the perspective of firms' corporate social responsibility (CSR). We aim to provide evidence that higher CSR performance will likely lead to more reliance on bond debt.

In conjunction, we allocate great care to pre- and post- concerns related to financial contracts' instances. The prevalence of such concerns stems from the risk of asymmetric information between the contracting parties, where it appears worth commenting on two

critical factors. On the one hand, adverse selection occurs before the completion of the financial contract, while moral hazard occurs after the deal. On the other hand, adverse selection models rest on the rationale that borrowers are reluctant to disclose private information to public lenders due to the following reasons: (i) it is expensive to cope with SEC (Securities and Exchange Commission) requirements upon public debt issuance (Blackwell and Kidwell 1988); or (ii) it weakens their competitive position towards their rivals. Thus, banks are supposedly expected to display a cost advantage in information production (Boot 2000; Fama 1985; Nakamura 1991), enabling them to correctly price their claims (Hadlock and James 2002) relatively to bondholders. Consequently, borrowers are more likely to prefer private to public debt issuance in higher adverse selection scenarios.

Conceptually, the moral hazard models advocate that levered firms' managers and/or shareholders may have incentives to undertake harmful actions against lenders (Jensen and Meckling 1976; Myers 1977). Hence, banks become keener than bondholders in monitoring firms' practices and performance (Diamond 1984; 1991; Houston and James 1996; Hoshi, Kashyap, and Scharfstein 1993; Almazan and Suarez 2003). In summary, the debt choice information-based theories imply that the pricing of public debt is more sensitive to changes in the firm's informational environment. Accordingly, firms prioritize less information-sensitive debt, i.e., bank loans, over more sensitive ones, i.e., bond debt, whenever there is an increase in information asymmetry.

Our study proposes further to explore this informational channel through the CSR spectrum. More particularly, it draws upon several previous studies to validate the role played by CSR in alleviating information asymmetry concerns. For instance, CSR disclosure enables investors to combine non-financial with financial data to compile a broader view of the firm and mitigate information asymmetry (Dhaliwal et al. 2012; El Ghouli et al. 2011; Cho, Lee, and Pfeiffer Jr 2013; Cui, Jo, and Na 2018).

Many previous studies have explored the effect of CSR from different perspectives. Main findings indicate that (i) the firm's CSR performance is positively associated with higher analysts coverage (Hong and Kacperczyk 2009), (ii) firms with higher CSR scores are more inclined to disclose their CSR activities to improve their information transparency (Wood 1991; Clarkson et al. 2008; Dhaliwal et al. 2012; Lys, Naughton, and Wang 2015), and

(iii) higher CSR performance is associated with lower dispersion of analysts' forecast and bid-ask spreads (Cui, Jo, and Na 2018). Finally, higher CSR performance contributes to better reputational capital, making firms less likely to engage in harmful practices (Lins, Servaes, and Tamayo 2017; Karpoff 2020). Based on the above reasoning, high CSR firms are better predisposed to assuage information asymmetry concerns than their lower CSR peers. Consequently, we expect high CSR firms to be more likely to substitute away from less-information sensitive debt, i.e., private debt, toward more-sensitive one, i.e., bond debt. In other words, we expect the existence of a significant and positive (negative) relationship between the firm's CSR performance and the proportion of bond (bank) debt to total debt.

Another competing view, rooted in neoclassical economics, considers CSR a value-destructive activity (Friedman 1970; McWilliams and Siegel 1997). According to this view, CSR is more beneficial to managers than shareholders. As a result, managers are tempted to unduly use the firm's resources or behave opportunistically for their interests. For instance, they are inclined to behave in the best way to build their reputations and increase their visibilities for many personal, societal, and political reasons. In doing so, they can accede to better positions, plan to engage in politics, or merely try to build a personal network (Borghesi, Houston, and Naranjo 2014; Becchetti, Ciciretti, and Hasan 2015). Therefore, high CSR commitment is expected to exacerbate agency problems. As a result, high CSR firms tend to rely more on bond debt to avoid banks' effective monitoring (Diamond 1991; Besanko and Kanatas 1993).

This study is novel as it relies on two important databases to gather CSR and firms' debt structure data. The S&P Capital IQ provides detailed debt structure data covering over 82,000 private and public companies worldwide. MSCI's IVA provides CSR data with the advantage of covering more comprehensive time-series data (Ferrell, Liang, and Renneboog 2016). Our observations span over the period 2003-2016. Findings indicate that, on average, high CSR firms exhibit a higher proportion of bond issuance than bank loans.

Additionally, we account for the effect of the global financial crisis (GFC) spanning the 2008–2009 period and conduct a difference-in-differences analysis. The GFC is a quasi-natural experiment since it is widely proposed in the context of an exogenous shock to CSR (Dyck et al. 2019; Ivashina and Scharfstein 2010; Sapienza and Zingales 2012; Lins, Servaes, and Tamayo 2017). Presumably, the GFC occurrence enhanced CSR's usefulness in

maintaining investors' confidence when the legal system and financial market, guarantors of good corporate governance, were seriously affected. Consequently, the firm's reputational capital acquired through previous CSR activities becomes a reliable substitute. Thus, we expect firms that have substantially invested in CSR activities to withstand the loss of trust better. In other words, it is more likely that investors perceive these firms as displaying lower levels of moral hazard, hence lower information asymmetry. Therefore, we compare the historical changes in firms' debt choices before, during, and after the financial crisis. We find that firms with high CSR performance experience a significant increase in the bond debt ratio compared to bank loans during and after the crisis. On the contrary, the relationship between the firm's CSR performance and its debt choice policy is less meaningful before the crisis.

After that, we go one step further by conducting a cross-country analysis. Again, we rely on previous studies supporting that corporate financial decisions are influenced by the country's institutional, legal, and cultural frameworks (La Porta et al. 1998; 1997; Williamson 1985; 1981; Djankov et al. 2008; Stulz and Williamson 2003; Beck, Demirgüç-Kunt, and Levine 2003). Including country-level characteristics considerably mitigates endogeneity concerns by explaining cross-country variations of the CSR-debt choice relationship and overcoming managers' discretion effect. We chose six country-level variables equally divided into two groups. The first group relates to the information asymmetry channel and contains the following variables: (i) financial disclosure quality, (ii) societal trust, and (iii) credit information index. The second group relates to the agency costs channel and consists of (i) the recovery rate, (ii) the score of resolving insolvency, and (iii) the creditors' legal right index. Empirical results lend credit to the above-mentioned assumptions. Indeed, results show that high CSR firms rely more on public debt in countries with lower information asymmetry and higher agency costs.

The link between firm CSR performance and debt choice is still under-explored to the best of our knowledge. We seek to fill this gap by analyzing the firms' debt choices regarding CSR performance between bonds and bank loans. We argue that higher CSR performance is likely to alleviate firms' information asymmetry, thus helping firms substitute less informational-sensitive debt instruments, i.e., bank loans, with more sensitive ones, i.e., bond debt. We contributed to the existing literature on debt choices. First, we focused on the impact

of CSR engagement, particularly its social and environmental components, on debt choices. Second, we consider cross-country characteristics to examine the role of institutional, cultural, and law enforcement towards debt alternatives between bonds and bank debts.

The remainder of the paper proceeds as follows. Section 2 builds on the existing literature to develop our hypotheses, while section 3 outlines the data and presents the main summary statistics. Section 4 discusses the regression results of our baseline model and the robustness tests. Section 5 reports the results of the cross-country heterogeneity tests. Finally, we conclude with section 6.

2. Background literature and hypotheses development

2.1. Background literature

The CSR literature provides two opposing streams about firms' commitment towards socially responsible practices (Kim, Li, and Li 2014; Ferrell, Liang, and Renneboog 2016). In the first one, firms engage in CSR to pursue social goals and maximize shareholder and stakeholder welfares (Cetindamar 2007; Deng, Kang, and Low 2013). Prior studies indicate that socially responsible firms tend to have a strong reputation (Shaw and Post 1993; Halme and Laurila 2009), adhere to good corporate governance practices that maximize value for shareholders (Ferrell, Liang, and Renneboog 2016), and increase the willingness of stakeholders to support firms' profitability and long-term goals (Deng, Kang, and Low 2013).

Therefore, it is not surprising that CSR can serve as a signal of high-quality firm. In this vein, Greening and Turban (2000) suggest that talented job applicants perceive socially responsible firms as attractive places of employment. Choi, Petra, and Guar (2015) argue that CSR practices send a positive signal about target firms' overall acquisition quality. Plumlee et al. (2015) prove that voluntary environmental disclosure quality is positively correlated with firm value. Finally, Benlemlih, Ge, and Zhao (2021) find that CSR news releases by undervalued firms lead to exuberant reactions in the stock markets.

The second streams rely on the agency theory (Jensen and Meckling 1976), stating that CSR manifests managerial agency problems (Hemingway and MacLagan 2004; Barnea and Rubin 2010; Krüger 2015; Masulis and Reza 2015). According to this view, insiders can enjoy private benefits and divert shareholders' scrutiny by investing in CSR. For instance, Galaskiewicz (1985) and Atkinson and Galaskiewicz (1988) show that CSR practices, such as

the contributions to nonprofit organizations, serve as a managerial strategy to earn a good personal reputation and respect among local business elites. In the same vein, Brown, Helland, and Smith (2006) point out that: "[...] giving programs may enable managers and directors to support their own pet charities at shareholder expense". This concern is reflected in Friedman's (1970) statement that firms should not do charity with investors' money.

Moreover, the dark side of CSR takes the form of "greenwash" that exploits socially responsible activities to provide a misleading picture and obscure managers' opportunistic behavior (Bénabou and Tirole 2010). Koehn and Ueng (2010) observe that firms among the top corporate givers use CSR as "moral window-dressing" to divert public attention away from suspicious and questionable practices. Kim, Li, and Li (2014) state that if managers' engagement is driven by opportunistic behavior or personal agenda, CSR induces a higher crash risk. An obvious implication of such an agency-motivated CSR is a negative impact on the firm's quality and reputation. Such an implication is supported, for example, by Krüger (2015), who provides evidence that investors consider news about positive CSR activities—that are likely to result from agency problems—as bad news and react negatively to them.

2.2. Hypotheses development

High-quality firms engage in CSR with the objective of maximizing shareholder and stakeholder welfare. However, information asymmetry is a major concern in such companies, which they constantly strive to avoid for the following reasons. First, information asymmetry reduces the financial benefits of CSR investments. Prior studies show that CSR firms enjoy better credit ratings, and thus cheaper equity financing (El Ghouli et al. 2011), lower cost of bank loans (Goss and Roberts 2011; Cheung, Tan, and Wang 2018), lower cost of corporate bonds (Ge and Liu 2015), and consequently higher firm value (Plumlee et al. 2015). On the contrary, information induces higher financing costs which turn to less appetite to trade in these firm's stocks (Dhaliwal et al. 2011), as such investments entail high risk and would negatively affect shareholders' wealth. Second, information asymmetry reduces the firms' ability and incentives to continue pursuing social goals and aligning them with the core business operations.

In light of the above arguments, one might expect high-quality CSR firms to prefer public over private debt financing. The reason is twofold. First, private lenders' intermediation will create opacity about the firms' social commitments and borrowers'

identity (Girerd-Potin, Jimenez-Garcès, and Louvet 2014), which increases information asymmetry. Second, prior studies prove that CSR premium is not significant or significant but marginal for private loans (Girerd-Potin, Jimenez-Garcès, and Louvet 2014; Goss and Roberts 2011; Benlemlih 2017).

For low-quality firms, where CSR activity duly results from managerial agency problems, more reliance on public debt financing is also expected. The underlying premise is that private lenders, especially banks, have an important informational advantage over bond issuers of what happens inside the box (Boyd and Prescott 1986; Berlin and Loeys 1988; Boubaker, Rouatbi, and Saffar 2017). This advantage comes from the banks' ability to access the private information of the borrowing firms at a much lower cost compared to arm's-length lenders (Fama 1985; Denis and Mihov 2003), which allows them to closely observe the firms' investments and detect any suspicious behavior induced in CSR activities. Moreover, the ownership concentration of debt claims is higher for bank lenders than bond issuers, which mitigates the possibility of free riding by individual lenders and wastefully duplicating monitoring efforts (Diamond 1984; Houston and James 1996). It follows that we would expect low-quality firms—that is, firms whose managers' engagement in socially responsible activities is driven by their opportunistic behavior—to avoid bank debt financing as a way of preserving the private benefits from CSR.

Given the considerations mentioned above, we propose the following hypothesis:

H₁: CSR activity is associated with greater reliance on public debt financing.

2.3. The effects of CSR on debt choice: cross-sectional heterogeneity

Since information asymmetry was the first channel of transmission used so far to explain the impact of a firm's CSR performance on debt choice, we have selected country-level variables that are likely to exert influence. More specifically, we are interested in three variables, *CIFAR*, *societal trust*, and *credit information index*.

CIFAR is a country-level index measuring the quality of financial disclosure. The index is based on ratings made by the Center for Financial Analysis and Research. In prior studies, Dhaliwal et al. (2012) establish a positive relationship between the *CIFAR* index and the firm's CSR disclosure. Therefore, for countries with high *CIFAR* scores, firms' CSR disclosures are expected to be of significant importance. In other words, CSR is expected to be more effective in alleviating information asymmetry for such countries. Consequently, we

advocate that high CSR firms operating in high CIFAR countries substitute bank loans with bond debts.

On the other hand, previous studies have established that specific cultural values and social norms are likely to play a key role in alleviating the moral hazard concerns, hence reducing information asymmetry at the firm level (Dudley and Zhang 2016; Chen et al. 2015; Dupont and Karpoff 2019; Fidrmuc and Jacob 2010; Karolyi 2016). Indeed, at the country level, values like trust, solidarity, transparency, and cooperation appropriate managers' behaviors and deter any abnormal activity. Hence, we expect the firm's CSR performance to be more effective in assuaging information asymmetry issues in countries embedded with similar values.

Accordingly, we consider societal trust a crucial variable to alleviate moral hazard concerns. *Societal trust* is a country-level measure provided by *World Values Survey* and defined by asking respondents, "Generally speaking, would you say that most people can be trusted or you need to be very careful in dealing with them?" Thus, the level of trust in each country is based on the percentage of respondents' answers, "most people can be trusted." According to the complementarity approach (Liang and Renneboog 2017), we expect firms to align their values with societal ones. More particularly, we expect high CSR firms established in countries displaying high societal trust to accumulate high reputational capital and be well perceived by financial markets. Consequently, such firms are associated with lower information asymmetry levels, making them more likely to substitute bank loans with public debt.

Finally, we consider the Credit Information Index, a country-variable, provided by the World Bank. This index measures the coverage, scope, and accessibility of credit information available through credit reporting service providers like credit bureaus or credit registries. We rely on previous studies showing that credit information sharing is an effective way to reduce information asymmetry. For instance, Pagano and Jappelli (1993) document that an increased amount of shared information is likely to reduce adverse selection issues by helping lenders extend loans to safe borrowers. On the other hand, Padilla and Pagano (2000) show that sharing information about borrowers' records will act as a disciplinary device leading to assuage moral hazard concerns by increasing borrowers' cost of default.

In summary, borrowers should be concerned about maintaining a good reputation because of the risk of credit information sharing. Mainly, firms that tend to reflect their good

image are worried about maintaining a high CSR performance. Thus, there is tight connectivity between effective CSR performance and credit information sharing. To emphasize more, we presume that high CSR firms with high credit information index countries benefit from decreased information asymmetry, leading to more reliance on public debt.

H₂: The positive association between firms' CSR performance and public debt is more pronounced for countries with high CIFAR, societal trust, and credit information index.

The second theory that touches our subject is the agency costs. We build upon previous studies that document a significant influence of strict legal rules and effective law enforcement in mitigating agency problems at the firm level (Giannetti 2003; Claessens, Djankov, and Klapper 2003; Öztekin 2015). We selected three-country variables that depict a high probability of impacting the firm's agency problems. We collect data for these variables from the Doing Business Database provided by the World Bank. The first variable is the recovery rate, defined as cents on the dollar recovered by secured creditors through judicial reorganization, liquidation, or debt enforcement (foreclosure or receivership) proceedings. The second one is the score of resolving insolvency computed as the simple average of the scores for each of the component indicators: the recovery rate of insolvency proceedings involving domestic entities and the strength of the legal framework applicable to judicial liquidation and reorganization proceedings. Finally, we use the creditors' legal right index to measure whether certain features that facilitate lending exist within the applicable collateral and bankruptcy laws.

Since we advocate that high CSR performance might be the consequence of managerial agency problems, we expect high CSR firms to escape the scrutiny of banks and opt instead for bond debt to raise funds. Moreover, this positive association between CSR performance and the portion of bond debt to total debt is expected to be more pronounced in countries with weak legal rules and waffling law enforcement. More particularly, we expect high CSR firms to rely more on public debt within countries characterized by lower recovery rates, inefficient resolving insolvency processes, and weak creditors' rights framework.

H₃: The positive association between firms' CSR performance and public debt is more pronounced for countries with lower recovery rates, inefficient resolving insolvency processes, and ineffective creditor's legal rights framework.

3. Research design

3.1. Debt structure data

We collect debt structure data from S&P Capital IQ, which provides detailed data for more than 60,000 global public and private companies worldwide with history from the mid-1990s. S&P Capital IQ database reports 21 key characteristics of debt components, such as security type, secured level, interest rate, maturity date, interest type, issued currency, and more. We follow previous work to focus on the ratio of bank loans to total debt and the ratio of corporate bonds to total debt to apprehend a firm's choice between private and public debt (Li, Lin, and Zhan 2019; Boubaker, Rouatbi, and Saffar 2017; Boubaker, Saffar, and Sassi 2018; Boubakri and Saffar 2019).

3.2. CSR data

We follow recent studies and use MSCI's IVA database to collect CSR data (Liang and Renneboog 2017; Ferrell, Liang, and Renneboog 2016). This database presents many advantages in light of the developed hypotheses. First, it provides a solution to one of the major criticisms that could be made to other CSR databases, namely that ESG ratings integrate the "G" component, which is fundamentally different from the other two "environment" and "social" pillars. Indeed, the "G" component covers the traditional issue of corporate governance, which focuses on improving the firm's governance mechanisms without necessarily incurring significant monetary investments. However, it is often not the case for improving other stakeholders' issues related to social and environmental fields. Thus, MSCI's IVA database offers ESG ratings that focus on social and environmental issues to correct this gap. For instance, to calculate the firm's ESG global rating, MSCI sets up 29 ESG scores. First, it includes Labor Force Relations, Industry Specific Carbon Risk, and Environmental Opportunity, which capture the highest weight in the global rating against less than 2% for traditional corporate governance issues. Second, the IVA ratings take into account both mandatory and voluntary aspects of CSR. While the mandatory aspect covers laws and legal provisions to either encourage firms to develop their CSR activities or to

penalize or prosecute them in the event of infringements, the voluntary aspect covers the strategies and actions implemented by the firm to capture environmental and social opportunities as well as manage the associated risks. Third, firms are rated and ranked not only based on their individual CSR performances but also in comparison with the same industry's peers both on the local and international market scales.

In conclusion, all the above elements may provide evidence that MSCI's IVA database offers a more comprehensive assessment than other competing databases by (i) focusing on the environmental and social aspects of the firm's CSR performance, (ii) taking into account not only the individual actions of the firm but also its interaction with its economic and institutional environment. Also, other databases (e.g. Thomson Reuters Asset4) provide shorter time-series and cover fewer firms worldwide. MSCI's IVA database supplies data since 1999 and covers the top 1,500 companies of MSCI World Index, the top 25 companies of MSCI Emerging Markets Index, the top 275 companies from the FTSE 100 and the FTSE 250 (Ferrell et al., 2016). The main IVA sample covers 20,121 firm-year observations from 40 countries spanning the 2003-2016 period.

3.3. Control variables

Relying on prior studies, we control for a wide range of firm characteristics that affect firms' choice between bank loans and publicly traded debt (Houston and James 1996; Denis and Mihov 2003; Lin et al. 2013; Boubaker, Saffar, and Sassi 2018). The inclusion of these controls aims at depicting the incremental effect of CSR performance on debt choice.

(i) *SIZE* is defined as the natural logarithm of total assets. Large firms have a lower level of information asymmetry, which reduces their need for private lenders' monitoring (Houston and James 1996). Moreover, larger firms have a higher debt capacity, enabling them to reduce public debt transaction costs by realizing economies of scale (Blackwell and Kidwell 1988). Accordingly, we expect *SIZE* to be positively associated with public debt.

(ii) *LEVERAGE* is measured as the ratio of total liabilities to total assets. On the one hand, since highly leveraged firms have acquired a lower reputation in credit markets, they exhibit lower demand for bank-monitored debt (Diamond 1991). On the other hand, since leverage may act as an internal disciplinary device, firms with higher leverage are likely to issue more bank debt since insiders have fewer incentives to insulate themselves from

creditors' control. Hence, the effect of leverage on bank debt use is expected to be positive or negative.

(iii) *PROFITABILITY* is measured by the firm's return on assets to proxy for project and credit quality (Denis and Mihov 2003). It is the ratio of operating income before depreciation to total assets. More profitable firms have a better reputation in credit markets and are more inclined to issue public debt. Diamond (1991) argues that a decrease in profitability leads firms with a high credit rating to borrow from banks. Consequently, profitability is expected to be positively associated with the firm's reliance on public debt.

(iv) *TANGIBILITY* is equal to the ratio of net property, plant, and equipment to total assets. Tangible assets serve as collateralization for debt, which mitigates lenders' risk. Therefore, firms with more fixed assets have a better credit quality (Denis and Mihov, 2003) and exhibit a preference for public debt. Consistent with models based on borrower reputation, we expect firms with tangible assets to issue more public debt than bank loans.

(v) *TOBIN's Q* measures firm growth opportunities and is defined as the sum of the market value of equity plus the book value of debt divided by total assets. Firms with higher growth opportunities are likely to be more successful and profitable in their business activities. Diamond's (1991) model predicts that successful firms with more investment opportunities rely less on bank-monitored debt. Therefore, we expect a positive relationship between Tobin's Q and the ratio of public debt.

(vi) *ALTMAN Z-score* measures the firm's likelihood of bankruptcy and is based on five financial ratios (1) working capital to total assets, (2) retained earnings to total assets, (3) EBIT to total assets, (4) market value of equities to total liabilities, and (5) sales to total assets. A score higher than 3 means that the firm is less likely to go bankrupt, while a score below 1.8 means the firm is likely exposed to bankruptcy. Prior literature reports opposing viewpoints regarding the relationship between the firm's z-score and its debt choice. For instance, Denis and Mihov (2003) find that firms with a higher probability of bankruptcy (lower z-score) tend to have a higher ratio of bank debt. On the other hand, another point of view argues that such firms are more likely to substitute away from private to public debt to avoid cash-flow-based financial covenants of bank loans forcing them to maintain a high

level of cash-flows (Sufi 2009; Roberts and Sufi 2009). Thus, we expect the relationship between Altman z-score and the public debt ratio to be either positive or negative.

(vii) ANALYSTS measures the number of analysts following a firm. According to Li et al. (2019), firms subject to highly monitored by analysts are inclined to exhibit more transparency and thus less information asymmetry, leading them to address public debt.

3.4. Sample construction and descriptive statistics

The variables introduced in the previous sections were analyzed over the period 2003-2016. We rely on Standard & Poor's Capital IQ for the corresponding debt structure of the firm. The source of CSR data is MSCI IVA rating database, while financial data are extracted from Compustat North America and Compustat Global for U.S. and Canadian firms on the one hand and firms from the remaining countries on the other hand respectively. To merge these databases, we employ standard matching procedures using the ISIN codes of firms. We then exclude observations for firms from the financial sector (SIC codes 6000-6999) and with missing observations on debt structure, CSR ratings, and any of the remaining variables discussed in the above section. Finally, we exclude firms with singleton observations since keeping singletons would overestimate statistical significance and underestimate standard errors (Correia 2015). The final sample contains 19,208 firm-year observations representing 3,354 unique firms from 40 countries. Table 1 presents the distribution of observations by country. We notice that (i) our sample is geographically diversified across 40 countries, and (ii) ratios of public debt, bank debt, and firms' CSR scores show significant variation across countries. Remarkably, three countries account for 61% of total observations, with the U.S. at the top of the list (36.57%), followed by Japan (12.48%) and the U.K. (11.96%).

Table II.1. Sample Distribution

This table reports summary descriptive statistics for the key variables used in the empirical tests to examine the impact of CSR engagement on the firm's debt choice for a maximum sample of 19,208 firm-year observations from 40 countries. The distribution of observations is reported by country. Bond Debt and Bank Debt are the main dependent variables of interest. CSR, measured by the firm's IVA rating, is the main independent variable. of interest. All variables are winsorized at the 1st and 99th percentiles. Sample period: 2003-2016. The definitions and data sources for the variables are provided in the Appendix.

<i>Country</i>	<i>Obs.</i>	<i>%</i>	<i>Public Debt %</i>	<i>Bank Debt %</i>	<i>CSR</i>	<i>CSR Score</i>	<i>CSR Industry Score</i>	<i>Env. Score</i>	<i>Social Score</i>	<i>Gov. Score</i>	<i>Size</i>	<i>Lev. %</i>	<i>Profit. %</i>	<i>Tang. %</i>	<i>Tobin</i>	<i>z-score</i>	<i>Anal ysts</i>
AUSTRALLA	983	5.12	31.45	56.81	3.00	5.17	5.00	4.85	5.40	5.77	8.05	45.35	11.32	32.25	1.53	2.48	9.63
AUSTRIA	73	0.38	32.24	60.94	3.56	5.63	5.85	5.63	5.65	5.93	9.14	47.30	11.56	46.28	1.23	1.84	4.01
BELGIUM	114	0.59	48.52	37.71	3.07	5.19	4.99	5.19	5.26	5.37	9.02	45.40	14.05	27.89	1.52	3.63	5.13
BRAZIL	221	1.15	35.40	52.29	2.81	5.02	4.68	5.21	4.91	5.05	9.19	48.93	13.33	31.95	1.67	2.44	2.22
CANADA	820	4.27	68.72	23.22	2.91	5.05	4.91	4.78	5.08	5.84	9.11	38.62	12.29	49.64	1.53	2.42	7.69
CHILE	44	0.23	56.88	39.44	1.91	4.16	3.28	4.00	4.46	4.57	9.45	39.51	10.41	51.55	3.95	7.56	1.93
CHINA	189	0.98	26.49	63.97	0.82	3.07	1.60	3.60	2.66	3.54	10.00	49.95	8.29	37.74	1.44	2.37	1.33
DENMARK	166	0.86	22.26	69.90	3.70	5.82	6.01	5.95	5.70	5.62	8.30	47.85	15.19	26.60	2.61	4.47	3.25
FINLAND	215	1.12	44.33	44.83	3.98	5.89	6.41	5.86	5.92	5.95	8.61	48.51	12.56	26.17	1.61	3.09	7.90
FRANCE	616	3.21	51.88	27.37	3.85	5.96	6.24	5.94	6.15	5.81	9.96	51.86	10.14	22.07	1.44	2.06	5.59
GERMANY	492	2.56	50.39	37.01	3.89	5.95	6.29	6.08	5.83	5.78	10.02	50.36	10.49	21.89	1.48	2.34	5.67
GREECE	34	0.18	39.35	61.30	2.91	5.26	5.00	5.14	5.49	5.94	8.52	52.05	18.76	39.32	1.66	3.07	2.59
HONG KONG	286	1.49	26.31	63.08	1.98	4.40	3.56	4.55	4.28	4.67	9.62	31.26	7.47	28.17	1.40	3.29	10.4
INDONESIA	36	0.19	16.56	82.70	2.17	3.94	3.78	4.46	3.98	3.59	8.41	42.95	22.26	56.35	3.10	6.31	1.19
INDIA	158	0.82	17.78	66.06	1.99	4.10	3.40	4.45	4.21	3.95	9.17	47.98	15.03	37.35	2.52	4.81	25.1
IRELAND	102	0.53	45.03	44.08	2.26	4.49	3.92	4.32	4.51	5.02	8.53	53.68	9.98	25.36	1.83	2.43	8.94
ISRAEL	36	0.19	57.32	38.72	1.33	3.96	2.51	4.13	4.19	4.42	9.12	59.70	14.68	24.11	2.47	3.38	5.97

<i>Country</i>	<i>Obs.</i>	<i>%</i>	<i>Public Debt %</i>	<i>Bank Debt %</i>	<i>IVA rating</i>	<i>IVA Score</i>	<i>IVA Industry Score</i>	<i>Env. Score</i>	<i>Social Score</i>	<i>Gov. Score</i>	<i>Size</i>	<i>Lev. %</i>	<i>Profit. %</i>	<i>Tang. %</i>	<i>Tobin</i>	<i>z-score</i>	<i>Anal ysts</i>
ITALY	245	1.28	35.09	53.34	2.67	4.96	4.47	4.69	5.34	5.20	9.61	48.92	10.01	27.72	1.33	1.91	3.48
JAPAN	2464	12.83	29.02	66.56	3.26	5.56	5.40	5.72	5.32	5.50	9.32	47.17	9.85	33.97	1.22	2.66	10.7
KOREA. SOUTH	157	0.82	45.30	49.96	2.96	5.13	4.97	5.57	4.66	5.22	9.99	48.39	11.86	39.37	1.21	2.66	2.57
LUXEMBOURG	30	0.16	47.95	50.09	3.13	5.28	5.11	5.25	5.52	5.35	9.14	44.71	13.94	37.65	1.41	2.28	2.33
MEXICO	70	0.36	62.91	34.18	1.86	4.00	3.17	4.06	3.85	4.16	9.24	46.77	18.27	44.70	1.88	3.44	2.24
MALAYSIA	79	0.41	37.45	55.53	1.78	3.77	3.25	4.16	4.03	3.27	8.78	40.71	11.84	42.43	1.63	3.26	8.01
NETHERLANDS	229	1.19	50.05	35.79	3.43	5.64	5.65	5.52	5.67	5.86	9.32	49.96	10.91	26.67	1.57	2.43	5.05
NORWAY	97	0.50	43.73	39.42	4.18	6.19	6.70	6.18	5.82	6.01	9.08	43.51	13.33	33.35	1.62	2.77	6.53
NEW ZELAND	87	0.45	46.42	33.46	3.14	5.07	5.19	4.95	5.16	5.40	7.53	41.44	13.96	53.49	1.71	2.87	6.87
PHILIPPINES	11	0.06	38.72	52.36	0.64	3.48	1.64	3.94	4.29	2.59	8.93	46.72	22.17	45.77	2.06	2.79	0.36
POLAND	26	0.14	27.33	65.76	2.50	4.14	4.08	4.39	3.98	5.29	8.28	35.67	13.73	40.17	1.42	3.20	1.31
PORTUGAL	61	0.32	55.70	41.67	3.16	5.42	5.23	5.44	5.37	5.45	9.36	61.05	10.55	41.24	1.40	1.65	1.96
RUSSIA	66	0.34	33.54	63.04	1.52	3.84	2.76	4.28	3.34	4.07	9.87	41.98	20.80	56.94	2.37	4.85	1.75
SINGAPORE	186	0.97	31.72	58.92	2.62	4.81	4.37	4.79	5.01	5.13	8.73	43.14	8.86	27.30	1.38	2.49	5.83
SOUTH AFRICA	194	1.01	20.17	63.73	3.23	5.06	5.37	4.85	5.26	6.12	7.90	39.23	14.93	40.28	1.98	4.08	5.04
SPAIN	215	1.12	19.82	64.12	3.77	5.83	6.16	5.93	5.72	5.93	9.62	55.00	11.69	30.64	1.64	2.39	4.31
SWEDEN	300	1.56	45.95	43.95	3.91	5.90	6.35	5.93	5.67	6.00	8.73	48.76	12.66	24.96	1.74	3.08	5.46
SWITZERLAND	434	2.26	53.01	34.73	3.13	5.26	5.30	5.23	5.33	5.68	8.94	39.96	12.69	22.34	1.83	3.63	6.19
TAIWAN	182	0.95	27.87	71.33	1.88	4.06	3.20	4.14	4.27	3.33	8.96	42.70	11.00	34.44	1.38	3.19	5.30
THAILAND	33	0.17	66.53	30.69	2.09	4.03	3.72	3.93	5.08	4.49	9.15	47.41	25.23	34.12	2.79	5.22	3.36
TURKEY	28	0.15	4.13	78.04	1.93	4.48	3.62	4.98	4.92	3.58	9.14	47.52	13.81	30.00	1.78	3.85	3.28
UNITED KINGDOM	2380	12.39	39.92	51.53	3.42	5.46	5.61	5.33	5.68	6.03	8.38	51.20	12.29	29.51	1.56	2.41	7.46
UNITED STATES	7049	36.70	72.98	21.24	2.48	4.64	4.22	4.57	4.70	5.40	8.78	46.50	13.28	30.05	1.86	3.20	11.7
Total	19208	100	50.82	41.59	2.88	5.02	4.82	5	5.04	5.47	8.84	46.81	12.08	31.57	1.66	2.9	9.09

Table 2 reports descriptive statistics for all variables used in our baseline regression model. On average, the firm-IVA rating in our sample is 2.884, reasonably close to the average IVA rating displayed by recent studies (Ferrell, Liang, and Renneboog 2016; Liang and Renneboog 2017). The average public (bank) debt ratios are 51 % (41 %). In addition, Table 2 confirms the heterogeneity of our sample with a representative sample for small and large ones. This heterogeneity persists for the control variables.

The Pearson's coefficients of correlation are summarized in Panel B. Particularly, the correlation between the firm's CSR rating and the ratio of private (public) debt is significantly negative (positive) at the 1 % level, which merely suggests that the firm's CSR performance should have an impact on debt policy. We propose to conduct a more advanced analysis throughout the following sections to check this suggestion.

Table II.2. Descriptive statistics

This table reports summary statistics for the key variables used in the empirical tests to examine the impact of CSR engagement on the firm's debt choice for a maximum sample of 19,208 firm-year observations from 40 countries. Panel A provides the mean, standard deviation, first quartile, median and third quartile. Panel B shows Pearson pair-wise correlations. Correlation coefficients reported in bold are significant at the 1% level. The definitions and data sources for the variables are provided in the Appendix.

Panel A. Summary statistics

Variable	Mean	Std Dev	25th Pctl	Median	75th Pctl
<i>Bond Debt</i>	50.820	37.392	11.424	54.131	88.010
<i>Bank Debt</i>	41.592	42.903	3.852	32.224	76.699
<i>CSR</i>	2.884	1.660	2.000	3.000	4.000
<i>CSR score</i>	5.022	1.565	4.000	4.000	6.040
<i>CSR Industry score</i>	4.820	2.439	2.930	4.760	6.440
<i>Environment score</i>	4.998	1.934	3.690	4.980	6.390
<i>Social score</i>	5.038	1.726	4.000	5.000	6.150
<i>Governance score</i>	5.469	1.973	4.340	5.230	6.810
<i>Size</i>	8.838	1.481	7.859	8.803	9.791
<i>Leverage</i>	46.814	18.997	34.766	46.124	57.905
<i>Profitability</i>	12.085	7.934	7.178	11.120	15.989
<i>Tangibility</i>	31.571	24.884	10.869	25.780	48.155
<i>Tobin's Q</i>	1.661	1.001	1.069	1.349	1.866
<i>z-score</i>	2.896	2.303	1.443	2.377	3.678
<i>Analysts</i>	9.088	7.665	2	8	14

Panel B. Pearson correlation

	<i>Bond Debt %</i>	<i>Bank Debt %</i>	<i>CSR</i>	<i>CSR Score</i>	<i>CSR Industry Score</i>	<i>Env. Score</i>	<i>Social Score</i>	<i>Gov. Score</i>	<i>Size</i>	<i>Lev. %</i>	<i>Profit. %</i>	<i>Tang. %</i>	<i>Tobin</i>	<i>z-score</i>	<i>Analysts</i>
<i>Bond Debt</i>	1.00	-0.883	0.026	0.022	0.03	0.012	0.02	0.07	0.288	0.028	0.046	0.025	0.014	-0.0924	0.184
<i>Bank Debt</i>		1.00	-0.060	-0.055	-0.065	-0.038	-0.045	-0.083	-0.322	0.007	-0.045	-0.01	-0.029	0.0672	-0.175
<i>CSR</i>			1.00	0.825	0.972	0.673	0.648	0.443	0.192	0.01	0.008	-0.058	-0.015	-0.0115	0.053
<i>CSR score</i>				1.00	0.846	0.818	0.783	0.462	0.239	0.016	0.009	-0.068	-0.047	-0.0258	0.078
<i>CSR Industry score</i>					1.00	0.69	0.666	0.452	0.196	0.001	0.01	-0.057	-0.018	-0.0103	0.057
<i>Environment score</i>						1.00	0.39	0.255	0.255	0.018	-0.006	-0.085	-0.039	-0.0257	0.076
<i>Social score</i>							1.00	0.324	0.135	0.018	0.027	-0.026	-0.034	-0.0164	0.034
<i>Governance score</i>								1.00	0.088	-0.011	0.030	0.006	0.007	0.0029	0.067
<i>Size</i>									1.00	-0.061	-0.127	0.033	-0.248	-0.2377	0.193
<i>Leverage</i>										1.00	-0.014	-0.030	0.043	-0.3629	-0.081
<i>Profitability</i>											1.00	0.101	0.516	0.5556	0.152
<i>Tangibility</i>												1.00	-0.111	-0.1312	-0.026
<i>Tobin's Q</i>													1.000	0.7263	0.149
<i>z-score</i>														1.000	0.172
<i>Analysts</i>															1.000

4. Main analysis: the CSR-Debt choice relation

4.1. Baseline model

We begin our analysis by regressing the firm's public (bank) debt ratio on CSR performance and control variables for the whole sample. Then, we build on extant research in the debt choice setting to estimate the following baseline pooled regression:

$$y_{it} = a_0 + \beta_1 CSR_{it} + \sum \gamma'_k X_{kit} + \text{Country dummies} + \text{Industry dummies} + \text{Year dummies} + \varepsilon_{it} \quad (1)$$

where y_{it} is the ratio of public (bank) debt defined as the sum of commercial paper, subordinated bonds and notes, senior bonds and notes reported to the firm i 's total liabilities at time t . CSR_{it} is firm i 's IVA rating, or the different CSR scores, at time t . X_{kit} are $(K \times 1)$ vectors of firm-level controls at time t . We include country, industry, and year dummies to control for unobservable debt choice factors.

4.2. Results

The regression results of estimating Eq (1) are reported in Table 3. The dependent variable is the ratio of public debt to total debt. We run three specifications using ordinary least squares (OLS) regression. In the first one, the ratio of public debt is regressed against the firm's CSR performance. The second specification integrates the control variables following the literature (Denis and Mihov 2003; Li, Lin, and Zhan 2019; Lin et al. 2013; Ben-Nasr 2019). In the third specification, we regress the firm's public debt on lagged control variables (Li, Lin, and Zhan 2019), considering that firms would probably need time to adjust their debt structure. We include dummies to control for the country, year, and industry-fixed effects in all specifications. Standard errors are double-clustered at the firm and time levels to control for cross-sectional and time-series dependence.

The results in Table 3 show a positive and strongly significant relationship between the firm's CSR performance and public debt ratio through all specifications. For instance, the estimates in column 2 show an increase of one-standard-deviation in the firm's CSR performance leads to 1.18 percentage points increase in the ratio of public debt. In a second step, we repeat the three specifications using the ratio of bank debt as a new dependent variable. The estimation results, reported through columns 4 to 6, provide strong support for our previous findings and establish a negative and significant relationship between the firm's

CSR performance and reliance on bank debt. To conclude, firms with higher CSR scores are likely to substitute away from less-information sensitive debt instruments, i.e. bank loans, to more sensitive ones, i.e. public debt.

Table II.3. CSR and Debt Choice

This table presents the regression results of the impact of CSR engagement on the firm's debt choice. The dependent variables are the proportion of bond debt, in columns (1), (2), and (3), and the proportion of bank debt in columns (4), (5), and (6). We use the IVA rating as the independent variable of interest for columns (1) and (4). Firm-level control variables are added to the regression in columns (2) and (5). All right-hand side variable are lagged by one year in columns (3) and (6). All regressions are estimated with country, industry, and year fixed effects. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	Bond debt			Bank debt		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>CSR</i>	2.168*** (15.416)	.683*** (4.93)		-2.669*** (-19.199)	-1.001*** (-7.31)	
<i>Size</i>		7.923*** (37.68)			-8.789*** (-43.064)	
<i>Leverage</i>		.093*** (5.539)			-.035** (-2.125)	
<i>Profitability</i>		.171*** (4.13)			-.073* (-1.721)	
<i>Tangibility</i>		-.024* (-1.721)			.006 (.414)	
<i>Tobinsq</i>		1.193** (2.525)			-1.688*** (-3.567)	
<i>zscore</i>		-1.48*** (-6.06)			.786*** (3.176)	
<i>Analysts</i>		.185*** (5.346)			-.13*** (-3.814)	
<i>CSR</i> <i>t</i> -1			.813*** (5.448)			-1.13*** (-7.716)
<i>Size</i> <i>t</i> -1			7.407*** (31.01)			-8.53*** (-37.184)
<i>Leverage</i> <i>t</i> -1			.099*** (5.151)			-.041** (-2.261)
<i>Profitability</i> <i>t</i> -1			.189*** (4.052)			-.12** (-2.54)
<i>Tangibility</i> <i>t</i> -1			-.022 (-1.47)			.001 (.057)
<i>Tobinsq</i> <i>t</i> -1			1.062* (1.947)			-1.76*** (-3.27)
<i>Zscore</i> <i>t</i> -1			-1.595*** (-5.726)			1.034*** (3.718)
<i>Analysts</i> <i>t</i> -1			.195*** (5.197)			-.124*** (-3.399)
<i>_cons</i>	45.219*** (96.796)	-26.134*** (-11.688)	-21.076*** (-8.216)	48.143*** (102.874)	125.658*** (56.94)	123.343*** (49.084)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R ²	.325	.4	.426	.32	.4	.434
Observations	19208	19208	15187	19208	19208	15187

To further confirm our findings, we re-conduct the regression of the baseline model using alternative measures of firms' CSR performance, namely the weighted average and the

industry-adjusted CSR scores. The results of the regression, reported in Table 4, bring additional credit to our main prediction. The estimates of the CSR coefficients remain positive (negative) and significant at the 1% threshold for firms' public (bank) debt ratios.

Table II.4. CSR and Debt Choice – Alternative CSR measures

This table reports results from regressing the firm's bond and bank debt on CSR scores and controls. Models (1) and (2) replicate the baseline regression using the weighted average CSR score and the industry adjusted CSR score, respectively, considering the firm's bond debt to be the dependent variable. Weighted average IVA scores are on a scale of 0-10. They are calculated for each firm separately as a weighted average of the environmental, social and governance pillar scores. These scores are calculated apart from industry linearization. Industry-adjusted IVA scores range from 0 to 10 and correspond to rating between best (AAA) and worst (CCC). The assessment of the firm's CSR performance is obtained using a so-called best-in-class approach which consists in globally comparing firms CSR performances within the same industry. Models (3) and (4), use the firm's bank debt as dependent variable. All regressions are estimated with country, industry, and year fixed effects. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	Bond debt		Bank debt	
	(1)	(2)	(3)	(4)
CSR adjusted score	.567*** (3.632)	.521*** (5.442)	-.936*** (-6.06)	
CSR industry score		.541*** (5.657)		-.738*** (-7.785)
<i>Size</i>	7.96*** (37.7)	7.893*** (37.455)	-8.815*** (-43.016)	-8.757*** (-42.836)
<i>Leverage</i>	.091*** (5.432)	.093*** (5.539)	-.033** (-1.977)	-.035** (-2.118)
<i>Profitability</i>	.168*** (4.048)	.171*** (4.116)	-.068 (-1.608)	-.072* (-1.706)
<i>Tangibility</i>	-.025* (-1.785)	-.024* (-1.706)	.007 (.482)	.006 (.397)
<i>Tobinsq</i>	1.244*** (2.633)	1.192** (2.521)	-1.763*** (-3.725)	-1.689*** (-3.571)
<i>zscore</i>	-1.476*** (-6.036)	-1.484*** (-6.071)	.784*** (3.16)	.791*** (3.197)
<i>Analysts</i>	.184*** (5.301)	.184*** (5.317)	-.127*** (-3.721)	-.128*** (-3.779)
<i>_cons</i>	-27.274*** (-12.091)	-26.388*** (-11.805)	127.599*** (57.39)	126.019*** (57.15)
Country FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adj R ²	.399	.4	.4	.4
Observations	19193	19208	19193	19208

4.3. Robustness checks

4.3.1. Decomposed CSR measures

As an additional test to the robustness of our results, we decompose CSR measures into three main pillars and reperform our regressions. We follow previous studies (Liang and Renneboog 2017; Girerd-Potin, Jimenez-Garcès, and Louvet 2014) and replace the global IVA

rating used as a proxy above with its three composing pillars, namely the environmental, the social, and the governance pillars. Table 5 reports that the three CSR sub-scores remain positively (negatively) and significantly related to the firm's proportion of public (bank) debt. We also note a higher impact of the social component in shaping the firm's debt choice. For instance, a one-standard-deviation increase in the social-pillar score increases the public debt ratio by 1.27 percentage points, compared to 0.53 and 0.86 percentage points for environmental and governance scores, respectively.

Table II.5. CSR and Debt Choice - Decomposed CSR Measures

This table reports results from regressing the firm's public debt on individual components of CSR and controls. Models (1), (2) and (3) replicate the baseline regression using the Environmental score, the Social score and the Governance score, respectively, and the firm's bond debt as the dependent variable. Models (4), (5) and (6), for their part, use the firm's bank debt as the dependent variable. All regressions are estimated with country, industry, and year fixed effects. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	Bond debt			Bank debt		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>environment</i>	.245* (1.935)			-.474*** (-3.795)		
<i>social</i>		.705*** (4.794)			-.821*** (-5.645)	
<i>governance</i>			.402*** (3.031)			-.498*** (-3.796)
<i>Size</i>	8.04*** (37.581)	8.306*** (37.824)	8.321*** (37.814)	-8.904*** (-42.932)	-9.169*** (-42.988)	-9.183*** (-42.894)
<i>Leverage</i>	.092*** (5.447)	.1*** (5.624)	.1*** (5.616)	-.033** (-2.013)	-.033* (-1.905)	-.034* (-1.916)
<i>Profitability</i>	.171*** (4.098)	.173*** (3.91)	.171*** (3.879)	-.07 (-1.635)	-.067 (-1.491)	-.065 (-1.446)
<i>Tangibility</i>	-.024* (-1.758)	-.029** (-1.985)	-.031** (-2.063)	.006 (.435)	.013 (.88)	.015 (.993)
<i>Tobinsq</i>	1.243*** (2.632)	1.246** (2.487)	1.271** (2.538)	-1.752*** (-3.693)	-1.891*** (-3.773)	-1.926*** (-3.834)
<i>zscore</i>	-1.463*** (-5.987)	-1.383*** (-5.384)	-1.371*** (-5.338)	.765*** (3.079)	.726*** (2.775)	.712*** (2.722)
<i>Analysts</i>	.188*** (5.404)	.237*** (6.233)	.237*** (6.224)	-.133*** (-3.901)	-.168*** (-4.507)	-.167*** (-4.479)
<i>_cons</i>	-26.511*** (-11.84)	-32.863*** (-13.5)	-31.64*** (-13.066)	126.241*** (57.07)	131.734*** (54.726)	130.428*** (54.527)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R ²	.399	.402	.401	.402	.403	.403
Observations	19166	16959	16950	19166	16959	16950

4.3.2. Additional tests

Additional tests are reported in Table 6. In the first four columns, we check whether our results are not sample-specific. Indeed, nearly 60% of the observations are monopolized by the USA, Great Britain, and Japan. Hence, estimates might be driven by the imbalance in

the distribution of observations and could be conditioned by factors specific to these three countries. Thereupon, we exclude firms from U.S., U.K, and Japan, then re-run the regression. Results are reported in column 1. Secondly, we exclude firms in countries with less than 100 observations because of concerns that these firms may not be representative of their countries' idiosyncrasies. Results are reported in column 2. Thirdly, we exclude firms with less than 10 observations. Then we adopt a more conservative approach and keep only firms with no gap of observations through all the sample period. Regression results for these two filters are reported in columns 3 and 4, respectively.

In columns 5 to 8, we check whether our estimates are conditioned by the research design. For instance, one concern related to the CSR score is that its "G" component could also cover traditional corporate governance issues. Indeed, corporate governance do not require substantial monetary investment like environmental and social pillars (Krüger 2015). Thus, we only retain the environmental (E) and social (S) pillars to address this concern. The CSR performance will be measured by the average (E) and (S) scores. The (G) score, for its part, will be added to the list of control variables. Results are reported in column 5. Secondly, we re-run the regression using three alternative econometric models, (i) the double clustering at the firm and country levels, (ii) the multi-level regression incorporating both fixed and random effects (Baltagi, Song, and Jung 2001), and (iii) the Tobit regression as the dependent variable is bounded between 0 and 1. Results are reported in columns (6) to (8).

For all these additional tests, the estimates of the CSR coefficient still depict positive and significant association with the ratio of bond debt at the 1% level, corroborating our main findings.

Table II.6. CSR and Debt Choice – Additional Tests

This table presents additional tests examining the impact of CSR performance on firms' debt choice. The firm's bond debt is the dependent variable of interest. For reasons of space, the results for bank debt are reported in the Appendix. In column 1, we drop U.S., Japan and U.K firms from the analysis. In column 2, we consider only the countries with more than 100 observations. In column 3, we consider only the firms with at least 10 firm-year observations. In column 4, we substitute the IVA rating (CSR) by the average of the environmental and social scores (ES_score) and add the governance score as an additional control variable. In column 5, we keep firms with no gap in observations through all the sample period. In column 6, we cluster the standard errors at the firm and country levels. In column 7, we run a multi-level regression. In column 8, we consider a Tobit regression. All regressions are estimated with country, industry, and year fixed effects. From columns 1 to 5, beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Drop U.S., Japan, and UK</i>	<i>Drop countries with less than 100 observations</i>	<i>Drop firms with less than 10 observations</i>	<i>ES score</i>	<i>Balanced panel</i>	<i>Clustering firm- country</i>	<i>Multi-level regression</i>	<i>Tobit regression</i>
CSR	1.175*** (5.182)	.734*** (5.179)	.792*** (4.511)		1.431*** (4.881)	.683*** (2.8)	.467*** (3.759)	.591*** (3.781)
Size	6.446*** (18.281)	7.912*** (36.707)	5.364*** (16.806)	8.213*** (36.511)	3.812*** (7.214)	7.923*** (19.111)	6.827*** (22.471)	10.131*** (22.524)
Leverage	.115*** (3.783)	.084*** (4.893)	.043 (1.597)	.1*** (5.628)	.074 (1.331)	.093*** (2.906)	-.092*** (-5.031)	-.016 (-.657)
Profitability	-.033 (-.522)	.194*** (4.372)	.281*** (4.056)	.171*** (3.853)	.479*** (4.217)	.171** (2.44)	.136*** (3.654)	.202*** (4.122)
Tangibility	-.038* (-1.757)	-.033** (-2.318)	-.037* (-1.793)	-.029** (-1.974)	.136*** (3.815)	-.024 (-.829)	-.014 (-.821)	-.01 (-.375)
Tobinsq	.615 (.776)	1.114** (2.254)	1.9** (2.297)	1.238** (2.465)	-4.889*** (-3.207)	1.193 (1.437)	3.407*** (7.886)	2.223*** (3.734)
z_score	-.917** (-2.229)	-1.606*** (-6.343)	-2.381*** (-5.625)	-1.37*** (-5.319)	-.013 (-.017)	-1.48*** (-3.397)	-2.138*** (-9.434)	-2.099*** (-6.735)
Analysts	-.043 (-.768)	.191*** (5.39)	.029 (.674)	.23*** (6.041)	.047 (.718)	.185*** (3.032)	.062** (2.015)	-.013 (-.323)
ES_score				.537*** (2.84)				
governance_score				.271* (1.903)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Drop U.S., Japan, and UK</i>	<i>Drop countries with less than 100 observations</i>	<i>Drop firms with less than 10 observations</i>	<i>ES score</i>	<i>Balanced panel</i>	<i>Clustering firm- country</i>	<i>Multi-level regression</i>	<i>Tobit regression</i>

<i>_cons</i>	-21.604*** (-5.655)	-24.987*** (-10.847)	4.36 (1.149)	-32.626*** (-13.377)	22.074*** (3.179)	-26.134*** (-6.084)	-9.312*** (-3.071)	-68.617*** (-7.067)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes
Adj R ²	.325	.401	.477	.401	.608	.4	-	-
Observations	7315	18484	9057	16908	2128	19208	19208	19208

4.3.3. *Additional control variables*

Since the work of La Porta et al. (1997, 1998), it has been well established that corporate financial decisions depend on the firm's environment. The debt choice issue should not derogate from this rule. Indeed, firms' managers cannot choose their source of debt regardless of the legal framework or the financial markets. Table 7 reports results for specifications that control for additional omitted country-level variables to ensure that these variables are not driving our results. We include these variables separately in Models (1) through (6) and include them all together in Model (7).

In column 1, we control for the Altman Z-score of the banking sector, while in columns 2 and 3, we account for the private bonds and the public bonds market size, respectively. In columns 4 and 5, we control for the regulatory quality and control of corruption scores, respectively, and in column 6, we integrate the credit score, a proxy for economies' rank. Our results persist under each model specification. Finally, we add all the control variables simultaneously and run the regression. Once again, our prior findings are confirmed, and the CSR coefficient still loads positive and significant impact at the 1% level.

Table II.7. CSR and Debt Choice – Additional Control Variables

This table reports results from regressing the firm's bond debt on CSR scores (IVA rating) and controls. For reasons of space, the results for the firm's bank debt are reported in the Appendix. All regressions are estimated with firm and year fixed effects. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and time levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Banks z-score	Getting credit	Private bond	Public bond	Regulatory quality	Control of corruption	All
<i>CSR</i>	.402*** (2.924)	.522*** (3.534)	.535*** (3.527)	.455*** (3.034)	.388*** (2.792)	.379*** (2.744)	.616*** (3.64)
<i>Size</i>	2.888*** (4.02)	2.131*** (2.608)	2.273*** (2.744)	1.774** (2.126)	2.854*** (3.83)	3.101*** (4.195)	1.475 (1.526)
<i>Leverage</i>	-.077*** (-2.912)	-.082*** (-2.899)	-.062** (-2.033)	-.067** (-2.192)	-.074*** (-2.78)	-.079*** (-2.929)	-.089*** (-2.643)
<i>Profitability</i>	.145*** (3.043)	.12** (2.31)	.19*** (3.663)	.185*** (3.571)	.134*** (2.759)	.118** (2.421)	.161*** (2.8)
<i>Tangibility</i>	-.044 (-1.383)	-.056 (-1.564)	-.022 (-.612)	-.015 (-.435)	-.047 (-1.436)	-.055* (-1.676)	-.021 (-.523)
<i>Tobinsq</i>	.702 (1.116)	.974 (1.434)	.024 (.031)	-.193 (-.26)	.76 (1.19)	.983 (1.541)	.502 (.589)
<i>zscore</i>	-1.244*** (-3.39)	-1.23*** (-3.175)	-.9** (-2.076)	-.813* (-1.9)	-1.2*** (-3.237)	-1.174*** (-3.169)	-.922* (-1.937)
<i>Analysts</i>	-.059 (-1.513)	-.025 (-.549)	-.006 (-.125)	.027 (.624)	-.049 (-1.214)	-.073* (-1.799)	.058 (1.052)
<i>Banks z-score</i>	-.172*** (-2.583)						.174* (1.775)
<i>Getting credit</i>		.045 (.397)					-.043 (-.349)
<i>Private bond</i>			.055** (2.181)				.07** (2.564)
<i>Public bond</i>				-.166*** (-7.315)			-.11*** (-3.799)
<i>Regul. quality</i>					1.138 (.664)		.344 (.133)
<i>Control corr.</i>						-12.332*** (-10.433)	-11.934*** (-8.255)
<i>_cons</i>	34.073*** (4.686)	32.859*** (2.763)	28.187*** (3.446)	46.263*** (5.457)	29.266*** (3.928)	47.177*** (6.342)	58.412*** (4.184)
Country FE	No	No	No	No	No	No	No
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R ²	.789	.798	.792	.794	.792	.793	.804
Observations	19183	17605	14485	14758	18828	18828	12883

4.3.4. *Endogeneity: The Granger causality test*

Previous empirical studies demonstrated that listed firms tend to engage in CSR activities more than unlisted ones (Goergen et al., 2019). As they are constantly put under the spotlight of investors, analysts, shareholders, and media, public companies' managers strive to improve their companies' reputation to benchmark and differentiate their firms from competitors and thus increase firms' market share (Servaes and Tamayo 2017). On the contrary, managers might exploit CSR efforts for personal gains whereby CSR activities are leveraged for their prestige and interests, leading them to become more popular and accede to political positions (Borghesi, Houston, and Naranjo 2014; Becchetti, Ciciretti, and Hasan 2015). Based on this argument, CSR commitment presumably drives public firms to raise funds through the bond market, an instrument described as active on both financial markets, hence more exposed to stakeholder scrutiny. In other terms, there is a risk that the direction of the causality might go from the public debt ratio to CSR performance.

We explore this avenue using Granger causality test and thus estimate two symmetric sets of regression. The first one is inspired by our baseline model so far. We regress the firm's public debt ratio on lagged CSR score, lagged public debt ratio, and lagged control variables. The second one is to regress the firm's CSR score on lagged public debt ratio, lagged CSR score, and lagged control variables. Results are presented in Table 8. The estimates of the first set, shown in columns 1 to 4, clearly support our previous findings. All the coefficients' estimates of the lagged CSR scores, namely the overall IVA rating, the environmental, the social, and the governance scores, are positive and significant at the 1% level. On the other hand, the estimates of the second set of regression, reported in columns 6 to 8, plainly reject reverse causality as a possible explanation of our results.

Table II.8. CSR and Debt Choice – Granger Causality Test

This table reports results of Granger-causality-style tests. In columns 1 through 4, the dependent variable is the proportion of bond debt held by the firm. In columns 5 through 8, the dependent variables are the firm's overall IVA rating, environmental score, social score, and governance score, respectively. In all specifications, the one-year lagged dependent variable is included as a control. For reasons of space, the results for the firm's proportion of bank debt are reported in the Appendix. All regressions are estimated with country, industry, and year fixed effects. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	<i>Public debt</i>				<i>CSR scores</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Public debt t-1</i>	.821*** (132.98)	.821*** (132.902)	.821*** (122.481)	.821*** (122.407)	0 (.47)	0 (.943)	0 (.655)	0 (-.868)
<i>CSR t-1</i>	.198** (2.335)				.788*** (147.468)			
<i>Environment t-1</i>		.214*** (2.633)				.771*** (118.899)		
<i>Social t-1</i>			.233** (2.471)				.668*** (77.769)	
<i>Governance t-1</i>				.228** (2.549)				.67*** (66.194)
<i>Size</i>	1.408*** (9.897)	1.388*** (9.63)	1.49*** (9.767)	1.477*** (9.662)	.068*** (9.389)	.118*** (12.908)	.035*** (3.542)	.066*** (5.303)
<i>Leverage</i>	.015 (1.451)	.015 (1.418)	.014 (1.219)	.015 (1.347)	-.001 (-1.513)	.001 (1.112)	-.001 (-1.202)	-.002** (-2.229)
<i>Profitability</i>	.073*** (2.664)	.071*** (2.601)	.068** (2.299)	.066** (2.229)	0 (.339)	.004** (2.336)	.001 (.463)	.003 (1.256)
<i>Tangibility</i>	-.01 (-1.273)	-.01 (-1.276)	-.014 (-1.632)	-.015* (-1.755)	0 (-1.021)	-.002*** (-3.592)	0 (.236)	.001 (1.274)
<i>Tobinsq</i>	.071 (.245)	.081 (.279)	.081 (.257)	.066 (.211)	.032** (2.226)	.019 (1.043)	.015 (.731)	.073*** (2.634)
<i>zscore</i>	-.263* (-1.273)	-.26 (-1.276)	-.196 (-1.632)	-.178 (-1.755)	.003 (.339)	.004 (2.336)	.012 (.463)	-.004 (1.256)

	(-1.662)	(-1.642)	(-1.142)	(-1.036)	(.385)	(.419)	(1.064)	(-.294)
<i>Analysts</i>	.057**	.056**	.057**	.057**	.005***	.003**	.005***	.004
	(2.52)	(2.46)	(2.273)	(2.269)	(3.622)	(2.056)	(2.753)	(1.628)
<i>_cons</i>	-4.352***	-4.657***	-5.903***	-5.829***	-.022	.061	1.283***	1.283***
	(-2.983)	(-3.18)	(-3.618)	(-3.589)	(-.304)	(.695)	(11.978)	(9.705)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R ²	.817	.817	.819	.819	.707	.67	.538	.464
Observations	15187	15147	13136	13127	15187	15144	13099	13090

4.3.5. *Endogeneity: The quasi-natural experiment*

As documented by prior studies, GFC is an exogenous shock, and the ensuing effects indicate a loss of public trust that substantially affected most firms (Ivashina and Scharfstein 2010; Sapienza and Zingales 2012; Nguyen, Nguyen, and Yin 2015; Lins, Servaes, and Tamayo 2017; Dyck et al. 2019). GFC consequential effects implore a higher level of information asymmetry, which severely appears during the economic turmoil. In such a turbulent environment, firms with good social capital emerged relatively unscathed compared to their peers. As CSR is one of the most significant drivers of a firm's social capital, we argue that CSR efforts should pay off more during and after the financial crisis. Indeed, several surveys paint a compelling view of this assumption coupled with strong evidence of previous studies. For instance, the Business for Social responsibility (BSR)³ 2008 survey shows that more than two-thirds of the respondents (63%) believe CSR would have lessened, or even prevented, the 2008 economic turmoil. While in response to the question "What is driving corporate responsibility today?", 84% of the respondents believe CSR is gradually strengthening the firm's social capital. Another survey conducted in 2009 by GlobeScan⁴ shows that investors see value in CSR, in that over half of the respondents believe it is "less risky to invest in socially responsible companies than socially irresponsible companies." Additionally, 86% of respondents agree that the social capital benefits of CSR are increasingly vital, and 79% confirm that stakeholders' demands of CSR are inevitably growing.

Following Dyck et al. (2019) and Lins et al. (2017), we use GFC from July 2008 to March 2009 to proxy for the trust shock. The exogenous nature of the shock should help us circumvent any lingering concerns of endogeneity that may undermine our regression results. More specifically, we investigate the effect of the exogenous increase in information asymmetry caused by the concurrence of GFC on firms' debt choices. We argue that higher CSR firms are more likely to better weather the trust

³ The Business for Social responsibility (BSR) 2008 survey, a leading U.S. CSR organization, in collaboration with Cone, LLC, a strategy and communications agency, surveyed more than 400 representatives from business, NGOs, government and academia, representing 28 countries.

⁴ A public opinion research consultancy that does reputation, brand, sustainability, engagement, and trends research, puts more emphasis on these findings. 1,600 experts drawn from corporate, government, NGO, academic, research, and service organizations, representing more than 90 countries were surveyed.

damage thanks to an enhanced social capital. Consequently, we expect these firms to rely more on bond debt, especially during and in the aftermath of the crisis. On the contrary, lower CSR firms are expected to prefer less information-sensitive debt instruments, namely bank loans.

We test this hypothesis in Table 9. We introduce three dummy variables to our regression. *Crisis*, a dummy variable equal to one for fiscal years 2008 and 2009. *Post_Crisis*, a dummy variable that takes the value of one for fiscal years beyond 2009, while *Pre_Crisis* is a dummy variable that takes the value of one for fiscal years prior to 2008. Our focus is on the coefficients of interaction terms between the firm's CSR performance and each of those three dummy variables. We use four measures for CSR, namely the IVA rating, the environmental, social, and governance scores. Results are reported in columns 1 through 4. Not only, all the estimates for the *crisis* and *post-crisis* periods remain positive and significant at the 1% level, but they are markedly higher than the results reported in tables 3 and 5. Only the governance score, in column 4, has loaded positive and significant impact for the pre-crisis. These results corroborate our assumptions and show that the environmental and social performances of the firm are likely to become more valuable during economic turmoil. A high CSR performance would make the firm appear a credible alternative and well regarded before institutions that have failed to prevent market abuses (Lins, Servaes, and Tamayo 2017; Dyck et al. 2019).

Table II.9. CSR and Debt Choice – Financial Crisis

This table reports results from difference-in-differences tests of the impact of the financial crisis 2008-2009 on the relationship between the firm's CSR performance and debt choice. The financial crisis covers the period from August 2008 to March 2009. CSR is the proxy for corporate social responsibility. *Crisis* is a dummy variable equal to one for fiscal years 2008 and 2009. *Post_Crisis* is a dummy variable that takes the value of one for fiscal years starting from 2010, while *Pre_Crisis* is a dummy variable that takes the value of one for fiscal years prior to 2008. The dependent variable is the proportion of bond debt held by the firm. For reasons of space, the results for the firm's proportion of bank debt are reported in the Appendix. CSR is the independent variable of interest and is measured in four ways, the firm's overall IVA rating reported in columns (1), and (5), environmental score reported in columns (2), and (6), social score reported in columns (3), and (7), and finally governance score reported in columns (4) and (8). Part 1 uses the full sample and reports regression estimates of firm's bond debt on CSR performance during the pre-crisis period, the crisis, as well as the post-crisis years, respectively. Part 2 uses subsamples of firms with high and low CSR scores, where *high (low)* is a dummy variable that takes the value of one if the firm's CSR performance is above the median of the distribution, and zero otherwise. Country, time and industry fixed effects are included in the model. Robust t-statistics adjusted for clustering by firms and years are reported inside parentheses. The superscripts asterisks ***, ** and * indicate statistical significance at the 0.01, 0.05 and 0.1 levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	Part 1				Part 2			
	(1) Overall	(2) Environment	(3) Social	(4) Governance	(5) Overall	(6) Environment	(7) Social	(8) Governance
<i>CSR*Pre_Crisis</i>	-.215 (-.974)	-.366* (-1.886)	-.205 (-.567)	.093 (.259)				
<i>CSR*Crisis</i>	.734** (2.489)	.426 (1.349)	.607* (1.76)	.613* (1.857)				
<i>CSR*Post_Crisis</i>	1.348*** (7)	.63*** (3.707)	.934*** (5.38)	.416*** (2.746)				
<i>CSR*Pre_Crisis*low</i>					-.617 (-1.257)	-.193 (-.606)	.412 (.942)	-.125 (-.383)
<i>CSR*Crisis*low</i>					.716 (.97)	-.331 (-.689)	.724 (1.612)	-1.201*** (-3.299)
<i>CSR*Post_Crisis*low</i>					-1.038** (-2.374)	-.883*** (-3.067)	-.226 (-.93)	-.659*** (-2.72)
<i>CSR*Pre_Crisis*high</i>					-.302* (-1.74)	-.246** (-2.228)	.138 (.825)	-.148 (-.748)
<i>CSR*Crisis*high</i>					.77*** (3.338)	.415** (2.529)	.613*** (3.901)	-.26 (-1.515)
<i>CSR*Post_Crisis*high</i>					.962*** (6.201)	.159 (1.591)	.583*** (5.71)	.047 (.495)
	(1) Overall	(2) Environment	(3) Social	(4) Governance	(5) Overall	(6) Environment	(7) Social	(8) Governance
<i>(Crisis – Pre_Crisis)*CSR</i>	.949	.792	.812	.52				
<i>(p-value)</i>	(.008)	(.027)	(.098)	(.281)				
<i>(Post_Crisis – Crisis)*CSR</i>	.614	.204	.327	-.197				

<i>(p-value)</i>	(.07)	(.558)	(.388)	(.581)				
<i>(Post_Crisis – Pre_Crisis)*CSR</i>	1.563	.996	1.139	.323				
<i>(p-value)</i>	(.000)	(.000)	(.004)	(.404)				
<i>Pre_Crisis*(CSR*high-CSR*low)</i>					.315	-.053	-.274	-.0023
<i>(p-value)</i>					(.479)	(.863)	(.526)	(.948)
<i>Crisis*(CSR*high-CSR*low)</i>					.054	.746	-.111	.941
<i>(p-value)</i>					(.935)	(.113)	(.797)	(.009)
<i>Post_Crisis*(CSR*high-CSR*low)</i>					2	1.042	.809	.706
<i>(p-value)</i>					(.000)	(.000)	(.000)	(.002)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R ²	.405	.404	.406	.406	.406	.404	.407	.406
Observations	19208	19166	16959	16950	19208	19166	16959	16950

We deepen the analysis in columns 5 to 8 by using subsamples of firms with high and low CSR scores, where *high (low)* is a dummy variable that takes the value of one if the firm's CSR performance is above (below) the median of the distribution, and zero otherwise. We account for a triple-interaction effect as reported in Table 9. Results clearly establish that the CSR performance does not influence the firm's debt choice before the crisis, whether in low CSR firms or high ones. It is only after the crisis took place that we witness a significant gap between the two subsamples. For example, the specification in column 5 has a significant coefficient on the triple interaction $CSR*Post_Crisis*high$ of 1.039 while it is -0.105 for the lower CSR subsample.

Moreover, the difference between the two coefficients is significantly different from zero, with a p-value of 0.029. The same applies to environmental and social scores, as shown by the results reported in columns 6 and 7. These findings suggest that the financial crisis stands as a turning point in how the market thinks and evaluates CSR practices. It seems that there is an increasing consensus on the key role played by CSR performance in assuaging information asymmetry concerns, which in turn enables higher CSR firms to rely more on bond debt compared to bank loans.

4.3.6. Cross-Sectional Heterogeneity

We rerun the regression of the baseline model by adding additional variables of interaction between the firm's CSR performance and country-level variables. A key advantage of this cross-country analysis is that explanatory variables are beyond the discretion of firms' managers, making results less likely to be affected by endogeneity. More specifically, we focus on country-level features related to information asymmetry and agency costs, the two channels used so far to examine the effect of CSR on a firm's debt choice. Regarding information asymmetry, we pick three variables, namely *CIFAR*, *societal trust*, and *Credit information index*. Regression results are reported in Table 10 through columns 1 to 3. While for the agency costs channel, we opt for *the recovery rate score*, *the resolving insolvency score*, and *the creditors' legal rights index*.

For each of these country variables, we generate a dummy variable, *HIGH (LOW)*, that takes the value one whenever the country's performance is above (below) the median of the distribution and zero otherwise. Then we run the regression using the interaction terms between the firm's CSR performance and the country's performance. For instance, the variable $CSR*CIFAR*HIGH$ reports the CSR performance of firms operating in countries displaying a high

quality of financial disclosure. Finally, we aim to identify any heterogeneity in the relationship CSR-debt choice initiated by country-level variables.

We find across all the country-level variables that the positive relation between CSR performance and bond debt continues to hold in a more robust and significant way in the subsample of firms located in countries with lower information asymmetry, i.e., countries with higher CIFAR, societal trust, and credit information index, and higher agency costs, i.e., lower recovery rate, resolving insolvency, and creditors' legal rights index. This result lends more credit to our hypotheses and attempts to validate previous findings. For instance, the coefficient estimate of interaction term linked to societal trust moved from an insignificant 0.133, for countries characterized by lower societal trust, to a highly significant estimate of 0.729, for countries displaying high societal trust, i.e., lower information asymmetry. Moreover, the difference between the two estimates is significantly different from zero at the 1% level. Same for the coefficient estimate related to the resolving insolvency score, which raises from an insignificant 0.178, for countries characterized by higher scores, to a significant estimate of 0.869, for countries with lower scores, i.e., higher agency costs.

Table II.10. CSR and Debt Choice – Cross Sectional Heterogeneity

This table examines the results of testing potential interaction between country-level variables, and firm's CSR performance in shaping the firm's debt choice. The dependent variable is the proportion of bond debt held by the firm. For reasons of space, the results for the firm's proportion of bank debt are reported in the Appendix. *High (low)* is a dummy variable that takes the value of one if the country's performance, regarding each of the six country-level variables, is above (below) the median of the distribution, and zero otherwise. For instance, CSR_cifar_high represents the CSR performance of firms operating within countries characterized by CIFAR scores above the median. Beneath each coefficient estimate, robust t-statistics adjusted for clustering by firms and years, are reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	Information asymmetry			Agency costs		
	(1) cifar	(2) trust	(3) credit information	(4) Recovery Rate	(5) Resolving Insolvency	(6) Legal rights
CSR_CIFAR_high	.584*** (3.021)					
CSR_CIFAR_low	.424* (1.909)					
CSR_TRUST_high		.729*** (4.459)				
CSR_TRUST_low		.133 (.626)				
CSR_CI_high			2.202*** (6.548)			
CSR_CI_low			.458*** (3.114)			
CSR_Recovery_high				.408** (2.474)		
CSR_Recovery_low				.666*** (3.878)		
CSR_Resolving_high					.178 (1.039)	
CSR_Resolving_low					.869*** (4.467)	
CSR_legalrights_high						.398** (2.288)
CSR_legalrights_low						.7*** (3.825)
$\beta_{HIGH} - \beta_{LOW}$ (<i>p-value</i>)	.16 .586	.596 0	1.744 0	-.258 .116	-.691 0	-.302 .135
Observations	17605	17605	17605	17605	17605	17605
R-squared	.836	.836	.836	.836	.836	.836
Adj R ²	.798	.798	.799	.798	.798	.798
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

5. Conclusion

Our paper contributes to the growing debate on the drivers of debt choices. We conducted our empirical analysis on a large global sample of 19,208 firms headquartered in 40 countries. The detailed empirical results show that firms with higher CSR performance are more prone to substitute bank loans with bond issuance. Moreover, this result holds after conducting a series of robustness tests that considered both firm and country-related characteristics.

Our results bring new insights at the firm level as they enrich the increasingly important debate on the usefulness of CSR for corporate financial policies. While during the last years, this debate seemed to revolve around the effect of CSR commitments on the well-being of firms' shareholders, our results show that CSR spread to other areas, namely the choice between bank and bond debt. In addition, we provide evidence that a higher CSR performance allows firms to have better access to the public debt market, thus diversifying more external financing sources.

This relationship is explained by the fact that a large spectrum of firms, i.e., high-quality and low-quality ones, embrace high CSR performance. High-quality firms are likely to reduce information asymmetry to highlight their CSR commitment and improve their reputational capital. Accordingly, such firms would naturally substitute away from less information-sensitive debt instruments, i.e., bank loans, to more sensitive ones, i.e., public debt. On the other hand, lower-quality firms are more likely to use their CSR commitment as a smoke screen to hide possible fraudulent behaviors. As a result, such firms are more likely to avoid the scrutiny of banks' monitoring. Consequently, they are expected to rely more on public debt compared to bank loans.

At the macro level, we make a double contribution to the recent debate on the interaction between country-level variables and CSR. First, we focus on the impact of the firm's CSR performance on debt policy decisions and highlight this endogenous and exogenous impact in the firm context and the interaction between the firm's choice and country-level variables. This interaction conveys a clear message about the differences and heterogeneous results across countries included in our sample. We found that the positive relationship between the firm's CSR performance and public

debt ratio is more pronounced in countries with lower information asymmetry and higher agency costs.

The second contribution pinpoints the macro-level drivers of CSR and showcases the effective role in shaping firms' financial policies (Ioannou and Serafeim 2012; Liang and Renneboog 2017). More specifically, we confront two points of view. On the one hand, the supply-side theory posits that CSR is a deliberate firms' response to inefficient markets and regulations concerning stakeholders' rights. Accordingly, the firm would involve CSR actions looking to present itself to stakeholders as a reliable alternative for failures of markets and regulations. On the other hand, the demand-side theory considers CSR to respond to some standards set by the law and some preferences expressed by consumers and other citizens. In this latter case, the firm is obliged to align these standards and preferences to avoid any economic penalty.

Yet, we face some confusion to validate the following hypotheses. First, the impact of CSR on the firm's debt choice was at its peak during the 2008-09 financial crisis, a period characterized by a notable failure of the market and regulations to protect stakeholders, which corresponds to the supply-side theory's assumptions. Second, regression results establish that the effectiveness of CSR is more pronounced in countries that encourage transparency and are characterized by high levels of societal trust as advocated by the demand-side theory. To summarize, these results suggest that the effectiveness of CSR in shaping firms' financial policies is a matter, *inter alia*, of a dynamic tradeoff between demand-side and supply-side forces. They are conditioned by the temporal changes and country contexts that forge the equilibrium point of supply and demand forces.

Appendices

Appendix II.A. 1. Variable definitions and sources

Variable	Definition	Source
Firm-level variables		
<i>Public debt</i>	Bond debt over total debt. Bond debt is defined as the sum of subordinated bonds and notes, senior bonds and notes. Total debt is defined as the sum of all types of debt, including commercial paper, revolving credit, term loans, subordinated bonds and notes, senior bonds and notes, capital leases, and other debt.	Capital IQ
<i>Bank debt</i>	Bank debt over total debt. Bank debt is defined as the sum of term loans and revolving credit, and total debt is defined as the sum of all types of debt, including commercial paper, revolving credit, term loans, subordinated bonds and notes, senior bonds and notes, capital leases, and other debt.	Same as above
<i>CSR</i>	IVA ratings measuring a company's ESG performance based on 29 key performance indicators covering environmental, social and governance issues.	MSCI's Intangible Value Assessment (IVA) database
<i>CSR score</i>	Weighted average IVA scores are on a scale of 0-10. They are calculated for each firm separately as a weighted average of the environmental, social and governance pillar scores. These scores are calculated apart from industry linearization.	Same as above
<i>CSR Industry score</i>	Industry-adjusted IVA scores range from 0 to 10 and correspond to rating between best (AAA) and worst (CCC). The assessment of the firm's CSR performance is obtained using a so-called best-in-class approach which consists in globally comparing firms CSR performances within the same industry.	Same as above
<i>Environment score</i>	IVA environmental score measuring a company's environmental performance.	Same as above
<i>Social score</i>	IVA social score measuring a company's social performance.	Same as above
<i>Governance score</i>	IVA governance score measuring a company's governance performance.	Same as above
<i>Size</i>	Natural logarithm of total assets in US dollars (millions)	Capital IQ
<i>Leverage</i>	Sum of long-term debt and debt in current liabilities, divided by total assets	Same as above
<i>Profitability</i>	Income before extraordinary items divided by total assets.	Same as above
<i>Tangibility</i>	Total property, plant, and equipment divided by total assets	Same as above
<i>Tobin's Q</i>	Sum of market value of equity and book value of debt, divided by total assets	Same as above
<i>Z-score</i>	Altman's (1968) Z-score, calculated as $(1.2 \times \text{working capital} + 1.4 \times \text{retained earnings} + 3.3 \times \text{earnings before interest and taxes} + 0.999 \times \text{sales}) / \text{total assets} + 0.6 \times (\text{market value of equity} / \text{book value of debt})$.	Same as above

<i>Analysts</i>	The number of analysts following the firm at year t .	IBES International
Country-level variables		
<i>Banks z-score</i>	Z-score for banking sector, is estimated as $(ROA + \text{equity} / \text{assets}) / \text{sd}(ROA)$; $\text{sd}(ROA)$ is the standard deviation of ROA.	Bankscope and Orbis Bank Focus databases.
<i>Private bond</i>	Private domestic debt securities issued by financial institutions and corporations as a share of GDP, calculated using the following deflation method: $\{(0.5) * [F_t / P_{et} + F_{t-1} / P_{et-1}]\} / [GDP_t / P_{at}]$ where F is amount outstanding of private domestic debt securities, P_e is end-of period CPI, and P_a is the average annual CPI.	Bank of International Settlements and World Development Indicators
<i>Public bond</i>	Public domestic debt securities issued by government as a share of GDP, calculated using the following deflation method: $\{(0.5) * [F_t / P_{et} + F_{t-1} / P_{et-1}]\} / [GDP_t / P_{at}]$ where F is amount outstanding of public domestic debt securities, P_e is end-of period CPI, and P_a is the average annual CPI.	Same as above
<i>Regulatory Quality</i>	Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	World Bank - <u>Worldwide Governance Indicators</u>
<i>Control corruption</i>	Control of corruption captures perceptions of the extent to which public power is exercised for private gains, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	Same as above
<i>Getting credit score</i>	The score for getting credit benchmarks economies for the regulatory best practice on the indicator set. The score is indicated on a scale from 0 to 100, where 0 represents the worst regulatory performance and 100 the best regulatory performance. The score is computed as the sum of the strength of legal rights index and the depth of credit information index. The strength of legal rights index measures whether certain features that facilitate lending exist within the applicable collateral and bankruptcy laws, while the depth of credit information index measures the coverage, scope and accessibility of credit information available through credit reporting service providers such as credit bureaus or credit registries.	World Bank - Doing Business
<i>CIFAR</i>	CIFAR is based on a disclosure index calculated by the Center for International Financial Analysis and Research by examining and rating companies' annual reports on their inclusion or omission of 90 items. These items fall into seven categories: general information, income statements, balance sheets, funds flow statement, accounting standards, stock data, and special items. Higher value indicates higher financial disclosure quality in a country	Center for International Financial Analysis and Research
<i>Trust</i>	Country-level measure, defined by asking respondents "Generally speaking, would you say that most people can be trusted or that you need have to be very careful in dealing with people?" The level of trust in each country is based on the percentage of respondents replying "most people can be trusted".	World Values Survey

<i>Credit information index</i>	The depth of credit information index measures the coverage, scope and accessibility of credit information available through credit reporting service providers such as credit bureaus or credit registries. The score for the depth of credit information benchmarks economies with respect to the regulatory best practice on the indicator. The score is indicated on a scale from 0 to 100, where 0 represents the worst regulatory performance and 100 the best regulatory performance.	World Bank – Doing Business
<i>Recovery rate</i>	The recovery rate is recorded as cents on the dollar recovered by secured creditors through judicial reorganization, liquidation or debt enforcement (foreclosure or receivership) proceedings. The calculation takes into account the outcome: whether the business emerges from the proceedings as a going concern or the assets are sold piecemeal. The score for recovery rate benchmarks economies with respect to the regulatory best practice on the indicator. The score is indicated on a scale from 0 to 100, where 0 represents the worst regulatory performance and 100 the best regulatory performance.	Same as above
<i>Resolving insolvency</i>	The score for resolving insolvency is the simple average of the scores for each of the component indicators: the recovery rate of insolvency proceedings involving domestic entities, as well as the strength of the legal framework applicable to judicial liquidation and reorganization proceedings.	Same as above
<i>Legal rights Index</i>	The strength of legal rights index measures whether certain features that facilitate lending exist within the applicable collateral and bankruptcy laws. The score for the strength of legal rights benchmarks economies with respect to the regulatory best practice on the indicator. The score is indicated on a scale from 0 to 100, where 0 represents the worst regulatory performance and 100 the best regulatory performance.	Same as above

Appendix II.B. 1. CSR and debt choice - Additional tests

This table presents additional tests examining the impact of CSR performance on firms' debt choice. The firm's bank loans is the dependent variable of interest. In column 1, we drop U.S., Japan and U.K firms from the analysis. In column 2, we consider only the countries with more than 100 observations. In column 3, we consider only the firms with at least 10 firm-year observations. In column 4, we substitute the IVA rating (CSR) by the average of the environmental and social scores (ES_score) and add the governance score as an additional control variable. In column 5, we keep firms with no gap in observations through all the sample period. In column 6, we cluster the standard errors at the firm and country levels. In column 7, we run a multi-level regression. In column 8, we consider a Tobit regression. All regressions are estimated with country, industry, and year fixed effects. From columns 1 to 5, beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Drop U.S., Japan, and UK	Drop countries with less than 100 observatio ns	Drop firms with less than 10 observatio ns	ES score	Balanced panel	Clustering firm- country	Multi-level regression	Tobit regression
CSR	-1.534*** (-6.586)	-1.001*** (-7.15)	-1.069*** (-6.514)		-1.536*** (-5.848)	-1.001*** (-4.27)	-.45*** (-3.584)	-.475*** (-3.021)
Size	-7.343*** (-20.35)	-8.879*** (-42.595)	-7.138*** (-24.523)	-9.023*** (-41.15)	-4.741*** (-10.292)	-8.789*** (-23.488)	-6.779*** (-22.357)	-9.426*** (-22.35)
Leverage	-.082*** (-2.765)	-.03* (-1.776)	-.012 (-.494)	-.034** (-1.963)	.007 (.148)	-.035 (-1.17)	.112*** (6.095)	.073*** (3.102)
Profitability	.029 (.435)	-.074 (-1.61)	-.222*** (-3.34)	-.063 (-1.384)	-.476*** (-4.733)	-.073 (-1.056)	-.105*** (-2.8)	-.124*** (-2.595)
Tangibility	.019 (.84)	.01 (.715)	.013 (.67)	.013 (.867)	-.089*** (-2.597)	.006 (.208)	.026 (1.521)	.031 (1.231)
Tobinsq	.738 (.903)	-1.808*** (-3.653)	-2.659*** (-3.495)	-1.876*** (-3.728)	1.981 (1.569)	-1.688** (-2.104)	-2.949*** (-6.783)	-1.671*** (-2.912)
zscore	-.222 (-.528)	.814*** (3.165)	1.865*** (4.879)	.709*** (2.701)	-.118 (-.171)	.786* (1.895)	1.218*** (5.343)	.485 (1.643)
Analysts	.096	-.133***	.059	-.159***	.086	-.13**	-.045	-.066*

<i>ES_score</i>	(1.633)	(-3.823)	(1.407)	(-4.274) -.749*** (-3.993) -.321**	(1.34)	(-2.166)	(-1.465)	(-1.669)
<i>governance_score</i>				(-2.281)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Drop U.S., Japan, and UK</i>	<i>Drop countries with less than 100 observatio ns</i>	<i>Drop firms with less than 10 observatio ns</i>	<i>ES score</i>	<i>Balanced panel</i>	<i>Clustering firm- country</i>	<i>Multi-level regression</i>	<i>Tobit regression</i>
<i>_cons</i>	119.216*** (30.704)	125.789*** (55.442)	105.215*** (30.017)	131.758*** (54.713)	77.042*** (12.677)	125.658*** (31.515)	101.22*** (33.437)	135.577*** (15.716)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes
Adj R ²	.33	.401	.513	.4	.615	.4	-	-
Observations	7315	18484	9057	16908	2128	19208	19208	19208

Appendix II.B. 2. CSR and debt choice - Additional Control Variables

This table reports results from regressing the firm's bank debt on CSR scores (IVA rating) and controls. All regressions are estimated with firm and year fixed effects. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and time levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Banks z-score	Getting credit	Private bond	Public bond	Regulatory quality	Control of corruption	All
<i>CSR</i>	-.342** (-2.522)	-.379*** (-2.599)	-.474*** (-3.091)	-.43*** (-2.831)	-.356*** (-2.591)	-.336** (-2.461)	-.444*** (-2.578)
<i>Size</i>	-2.922*** (-3.936)	-2.461*** (-2.906)	-2.306*** (-2.647)	-1.884** (-2.15)	-2.928*** (-3.835)	-3.052*** (-4.025)	-1.922* (-1.891)
<i>Leverage</i>	.088*** (3.357)	.092*** (3.247)	.101*** (3.234)	.108*** (3.485)	.089*** (3.372)	.09*** (3.428)	.129*** (3.664)
<i>Profitability</i>	-.097** (-1.983)	-.073 (-1.377)	-.103* (-1.899)	-.1* (-1.832)	-.083* (-1.679)	-.073 (-1.474)	-.069 (-1.137)
<i>Tangibility</i>	.079** (2.43)	.092** (2.429)	.072** (1.967)	.068* (1.869)	.083** (2.466)	.086** (2.569)	.089* (1.955)
<i>Tobinsq</i>	-.126 (-1.84)	-.045 (-0.61)	.254 (.315)	.313 (.391)	-.119 (-1.71)	-.299 (-4.29)	.133 (.147)
<i>zscore</i>	.145 (.366)	.002 (.005)	-.086 (-1.84)	-.086 (-1.87)	.073 (.182)	.053 (.132)	-.201 (-.392)
<i>Analysts</i>	.053 (1.348)	.036 (.79)	.01 (.217)	-.003 (-.068)	.057 (1.402)	.074* (1.817)	-.037 (-.643)
<i>Banks z-score</i>	.229*** (3.237)						-.025 (-.238)
<i>Getting credit</i>		.315*** (2.725)					.402*** (3.033)
<i>Private bond</i>			.015 (.524)				-.037 (-1.273)
<i>Public bond</i>				.104*** (4.267)			.066** (2.137)
<i>Regul. quality</i>					2.96* (1.708)		3.988 (1.47)
<i>Control corr.</i>						10.348*** (8.462)	11.057*** (7.498)
<i>_cons</i>	56.993*** (7.594)	31.168** (2.514)	56.844*** (6.534)	47.251*** (5.259)	57.301*** (7.408)	47.147*** (6.138)	-2.507 (-.165)
Country FE	No	No	No	No	No	No	No
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R ²	.777	.787	.773	.773	.78	.781	.785
Observations	19183	17605	14485	14758	18828	18828	12883

Appendix II.B. 3. CSR and debt choice – Granger Causality Test

This table reports results of Granger-causality-style tests. In columns 1 through 4, the dependent variable is the proportion of bank debt held by the firm. In columns 5 through 8, the dependent variables are the firm's overall IVA rating, environmental score, social score, and governance score, respectively. In all specifications, the one-year lagged dependent variable is included as a control. All regressions are estimated with country, industry, and year fixed effects. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	<i>Bank debt</i>				<i>CSR scores</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Bank debt t-1</i>	.788*** (116.099)	.788*** (116.11)	.79*** (108.161)	.79*** (108.093)	0 (-1.513)	-.001* (-1.694)	0 (-1.153)	0 (-.448)
<i>CSR t-1</i>	-.313*** (-3.528)				.788*** (147.176)			
<i>Environment t-1</i>		-.324*** (-3.847)				.77*** (118.765)		
<i>Social t-1</i>			-.322*** (-3.266)				.668*** (77.715)	
<i>Governance t-1</i>				-.255*** (-2.76)				.67*** (66.084)
<i>Size</i>	-1.944*** (-12.756)	-1.909*** (-12.42)	-2.016*** (-12.31)	-2.014*** (-12.257)	.066*** (8.961)	.116*** (12.643)	.033*** (3.336)	.062*** (4.888)
<i>Leverage</i>	-.003 (-.238)	-.002 (-.187)	0 (.03)	0 (.006)	-.001 (-1.524)	.001 (1.12)	-.001 (-1.199)	-.002** (-2.283)
<i>Profitability</i>	-.061** (-2.081)	-.06** (-2.038)	-.046 (-1.455)	-.044 (-1.386)	0 (.331)	.004** (2.347)	.001 (.467)	.003 (1.222)
<i>Tangibility</i>	.003 (.302)	.003 (.299)	.007 (.735)	.008 (.829)	0 (-1.027)	-.002*** (-3.603)	0 (.231)	.001 (1.291)
<i>Tobinsq</i>	-.245 (-.774)	-.254 (-.798)	-.256 (-.749)	-.276 (-.804)	.032** (2.181)	.019 (1.008)	.014 (.703)	.072*** (2.596)
<i>zscore</i>	.113 (.658)	.111 (.642)	.05 (.269)	.044 (.238)	.003 (.409)	.004 (.418)	.012 (1.065)	-.003 (-.238)
<i>Analysts</i>	-.036 (-1.616)	-.035 (-1.543)	-.045* (-1.834)	-.045* (-1.844)	.005*** (3.604)	.003** (2.049)	.005*** (2.749)	.004 (1.583)
<i>_cons</i>	27.581*** (15.439)	27.945*** (15.557)	29.024*** (14.455)	28.706*** (14.395)	.024 (.308)	.119 (1.244)	1.329*** (11.436)	1.318*** (9.216)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R ²	.792	.792	.794	.794	.707	.67	.538	.464
Observations	15187	15147	13136	13127	15187	15144	13099	13090

Appendix II.B. 4. CSR and debt choice - Financial Crisis

This table reports results from difference-in-differences tests of the impact of the financial crisis 2008-2009 on the relationship between the firm's CSR performance and debt choice. The financial crisis covers the period from August 2008 to March 2009. CSR is the proxy for corporate social responsibility. *Crisis* is a dummy variable equal to one for fiscal years 2008 and 2009. *Post_Crisis* is a dummy variable that takes the value of one for fiscal years in the period from 2010 to 2016, while *Pre_Crisis* is a dummy variable that takes the value of one for fiscal years prior to 2008. The dependent variable is the proportion of public debt held by the firm. For reasons of space, the results for the firm's proportion of bank debt are reported in the Appendix. CSR is the independent variable of interest and is measured in four ways, the firm's overall IVA rating reported in columns (1), and (5), environmental score reported in columns (2), and (6), social score reported in columns (3), and (7), and finally governance score reported in columns (4) and (8). Part 1 uses the full sample and reports regression estimates of firm's public debt on CSR performance during the pre-crisis period, the crisis, as well as the post-crisis years, respectively. Part 2 uses subsamples of firms with high and low CSR scores, where *high (low)* is a dummy variable that takes the value of one if the firm's CSR performance is above the median of the distribution, and zero otherwise. Country, time and industry fixed effects are included in the model. Robust t-statistics adjusted for clustering by firms and years are reported inside parentheses. The superscripts asterisks ***, ** and * indicate statistical significance at the 0.01, 0.05 and 0.1 levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	Part 1				Part 2			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Overall	Environ ment	Social	Govern ance	Overall	Environ ment	Social	Govern ance
<i>CSR*Pre_Crisis</i>	-.322 (-1.508)	-.083 (-.443)	-.071 (-.2)	-.342 (-.996)				
	-	-.962***	-	-				
<i>CSR*Crisis</i>	1.153*** (-3.999)		.986*** (-2.861)	1.083*** (-3.339)				
	-	-.633***	-	-.434***				
<i>CSR*Post_Crisis</i>	1.463*** (-7.632)		.901*** (-5.234)					
<i>CSR*Pre_Crisis*low</i>					.166 (.339)	.085 (.275)	-.292 (-.684)	.106 (.333)
<i>CSR*Crisis*low</i>					-1.089 (-1.469)	.169 (.352)	-.672 (-1.556)	1.245*** (3.553)
<i>CSR*Post_Crisis*low</i>					.813* (1.86)	1.023*** (3.537)	.041 (.171)	.783*** (3.222)
<i>CSR*Pre_Crisis*high</i>					-.132 (-.789)	-.036 (-.336)	-.225 (-1.374)	-.037 (-.193)
<i>CSR*Crisis*high</i>					-1.176*** (-5.127)	-.758*** (-4.627)	- (-4.98)	-.051 (-.293)
<i>CSR*Post_Crisis*high</i>					-1.092*** (-7.08)	-.152 (-1.559)	-.789*** (-5.854)	-.04 (-.436)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Overall	Environ ment	Social	Govern ance	Overall	Environ ment	Social	Govern ance
<i>(Crisis – Pre_Crisis)*CSR</i>	-.831	-.879	-.915	-.741				

<i>(p-value)</i>	(.017)	(.012)	(.058)	(.111)				
<i>(Post_Crisis – Crisis)*CSR</i>	-.31	.329	.085	.649				
<i>(p-value)</i>	(.35)	(.338)	(.822)	(.063)				
<i>(Post_Crisis – Pre_Crisis)*CSR</i>	-1.141	-.55	-.83	-.092				
<i>(p-value)</i>	(.000)	(.023)	(.032)	(.806)				
<i>Pre_Crisis*(CSR*high-CSR*low)</i>					-.298	-.121	.067	-.143
<i>(p-value)</i>					(.501)	(.682)	(.874)	(.671)
<i>Crisis*(CSR*high-CSR*low)</i>					-.087	-.927	-.117	-1.296
<i>(p-value)</i>					(.898)	(.047)	(.778)	(.000)
<i>Post_Crisis*(CSR*high-CSR*low)</i>					-1.905	-1.175	-.634	-.823
<i>(p-value)</i>					(.000)	(.000)	(.006)	(.000)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R ²	.401	.399	.401	.399	.402	.399	.4	.399
Observations	19208	19166	16959	16950	19208	19166	16959	16950

Appendix II.B. 5. CSR and debt choice – Cross-sectional heterogeneity

This table examines the results of testing potential interaction between country-level variables, and firm's CSR performance in shaping the firm's debt choice. The dependent variable is the proportion of bank debt held by the firm. *High (low)* is a dummy variable that takes the value of one if the country's performance, regarding each of the six country-level variables, is above (below) the median of the distribution, and zero otherwise. For instance CSR_cifar_high represents the CSR performance of firms operating within countries characterized by CIFAR scores above the median. Beneath each coefficient estimate, robust t-statistics adjusted for clustering by firms and years, are reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	Information asymmetry			Agency costs		
	(1) cifar	(2) trust	(3) credit information	(4) Recovery Rate	(5) Resolving Insolvency	(6) Legal rights
CSR_CIFAR_high	-.382** (-2.045)					
CSR_CIFAR_low	-.309 (-1.341)					
CSR_TRUST_high		-.391** (-2.48)				
CSR_TRUST_low		-.287 (-1.347)				
CSR_CI_high			-1.444*** (-4.16)			
CSR_CI_low			-.312** (-2.147)			
CSR_Recovery_high				-.307* (-1.897)		
CSR_Recovery_low				-.414** (-2.423)		
CSR_Resolving_high					-.124 (-.781)	
CSR_Resolving_low					-.584*** (-2.929)	
CSR_legalrights_high						-.217 (-1.261)
CSR_legalrights_low						-.546*** (-2.991)
$\beta_{HIGH} - \beta_{LOW}$ (p-value)	-.073 .804	-.104 .633	-1.132 0	.107 .503	.46 .031	.329 .102
Observations	17605	17605	17605	17605	17605	17605
R-squared	.827	.827	.827	.827	.827	.827
Adj R ²	.787	.787	.787	.787	.787	.787
Control variables	No	No	No	No	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

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Chapter III

ESSAY 2: Financial Statement Comparability and Firm's Debt Choice

1. Introduction

Over the past decades, U.S. firms have demonstrated an increasing interest in debt financing, as witnessed by the ratio of debt scaled by the country's GDP for the non-financial corporate sector. This trend nearly doubled since 1980 from slightly more than 50 percent to closely 100 percent by the end of 2019⁵. Moreover, Rauh and Sufi (2010) documented a regular yearly switch from one type of debt to another without significantly affecting firms' total leverage. Despite this glaring rise of debt financing and the growing change in debt structure, little is known about the factors influencing a firms' choice decision between bank and public debt, partly because useable and comprehensive data on firms' debt sources have only recently become accessible (Boubaker et al., 2018; Boubakri and Saffar, 2019; Colla et al., 2013; Li et al., 2019). We contribute to the ongoing efforts to enhance our understanding of factors that explain a firm's debt choice by examining whether the comparability of a firm's financial statements impacts its debt choice. In particular, we suggest and bring evidence for an information-based channel through which higher accounting comparability significantly influences debt choice.

Indeed, existing literature has established that information asymmetry represents a cornerstone in the firm's debt choice. Information-based models of debt choice contend that the pricing of public debt is more sensitive to changes in the firm's

⁵ <https://www.bostonfed.org/publications/current-policy-perspectives/2020/the-great-leverage-2-0-a-tale-of-different-indicators-of-corporate-leverage.aspx>

informational environment. More specifically, the more a firm operates in a less-informationally transparent environment, the more it tends to replace public debt with bank loans (Denis and Mihov, 2003). For instance, previous empirical studies have shown that firms that are reluctant to release private information to the public, whether because such disclosure is costly or because it will deprive them of competitive advantages, privilege bank loans to debt securities (Blackwell and Kidwell, 1988; Boot, 2000; Fama, 1985; Nakamura, 1991). In the same vein, firms lacking effective monitoring, hence displaying higher levels of moral hazard, would prefer private debt to finance their activities (Almazan and Suarez, 2003; Boubaker et al., 2017, 2018; Diamond, 1984, 1991).

The comparability of firms' financial statements is closely related to information asymmetry issues. For instance, the Financial Accounting Standards Board (2010) asserts that comparability is a *sine qua non* condition to improve qualitative attributes of pertinent and conscientiously represented information. As such, *"information about a reporting entity is more useful if it can be compared with similar information about other entities and with similar information about the same entity for another period or another date."* Similarly, the U.S. Securities and Exchange Commission (2002) advocates that *"the only way to achieve fair, liquid and efficient capital markets worldwide is by providing investors with information that is comparable, transparent and reliable."*

In line with regulatory efforts to enhance the comparability of financial statements, several studies have highlighted the informational benefits of comparability, which fundamentally consist of lowering information asymmetry between the firm and outsiders. These benefits include (i) enhancing both the financial reporting quality and accruals pricing (Chen and Gong, 2019), (ii) improving the accuracy of financial analysts' forecasts (De Franco et al., 2011; Neel, 2017), (iii) promoting transnational information transfer (Wang, 2014), (iv) reducing the equity capital cost (Imhof et al., 2017), (v) lowering issuers' credit risk and cost of borrowing (Fang et al., 2016; Kim et al., 2013).

We explore the influence exerted by the firm's financial statements comparability on its debt choice policy, because prior literature reports the informational environment is more influential in the decision-making process within the debt market than in the equity market (Hand et al., 1992; Dichev and Piotroski,

2001). Indeed, because debt markets suffer more from incomplete information, the provision of additional information would be more valuable and accordingly have higher incremental effects on debt instruments. It would follow that the informational impact of comparability is expected to substantially impact the debt choice decisions. We develop two competing hypotheses in relating financial statement comparability with debt choice.

First, we argue that a higher comparability allows bondholders to easily compare and deduce the required information for an effective credit quality assessment, reducing credit risk for bondholders and lowering the overall cost of debt (Kim et al., 2013). Therefore, we advocate that more comparable financial disclosures offset banks' advantage over debtholders in terms of information processing and monitoring, making private debt less attractive and public debt less expensive. In such a setting, we conjecture firms displaying higher financial statements comparability are expected to rely more on public debt financing. *Second*, we contend that financial statement comparability scales down information asymmetries (information risk) between the firm and the bank by mitigating adverse selection and moral hazard issues (Fang et al., 2016). Accordingly, firms displaying higher comparability scores are expected to enjoy an easier access to bank loans, suggesting a positive relationship between them.

To test the aforementioned predictions, we benefit from the comparability measure of De Franco et al. (2011). We use the ratio of bank loans (i.e., the sum of revolving credit, term loans, and commercial paper) to total debt and the ratio of corporate bonds (i.e., the sum of senior and subordinated bonds and notes) to total debt to measure the firm's debt choice. Using US publicly listed firms as our sample over the 2001 to 2018 period, we document a significant and positive association between the firm's comparability score and its proportion of public debt while a significant yet negative one when it comes to private debt financing. To mitigate issues of endogeneity due to potential reverse causality and/or omitted variable bias, we undertake a series of tests. First, we include firm and industry fixed effects (Kim et al., 2020). Second, we run the regressions using lagged values of comparability (Chen and Gong, 2019). Third, we control for firm specific accounting quality, which falls under managers' discretionary decisions (Imhof et al., 2017). By doing so, we ensure that our

measure of accounting comparability solely reflects the potential benefits of comparability but not those of firm specific accounting quality. Fourth, we use the two-stage least squares technique (2SLS). Finally, we implement the two-step system GMM regression. Our main findings remain unaffected when these batteries of tests are employed.

Next, we analyze how the influence of the comparability on the debt choice decision may differ in the cross-section of firms. We find that the positive (negative) association between comparability and public debt (bank debt) is more exacerbated whenever the information asymmetry, as proxied by the number of analysts following the firm and the probability of informed trade (*PIN*), becomes more severe. It is also more prominent in the presence of financing constraints, as proxied by firm size, HP index (Hadlock and Pierce, 2010), and WW index (Whited and Wu, 2006).

Overall, our research adds to the existing literature in two primary ways. First, we bring new insights into the ongoing effort to apprehend the determinants of debt choice. Albeit the growing importance of debt financing, firms' debt choice has received little attention. A mounting body of literature suggests that ownership structure affects firms' debt choices (Boubakri and Saffar, 2019; Lin et al., 2013). In another context, Chen et al. (2017) report that firms with high audit quality rely more on public debt, while García-Teruel et al. (2014) show a positive link between accruals quality and bank debt. Finally, Chen et al. (2021) show that firms with higher *vega* rely less on bank debt to the detriment of public debt. We contribute to this literature by establishing that firms with higher comparability rely more on public debt.

Second, we extend the growing research on financial statement comparability. Studies show that comparability of financial statements affects the cost of equity (Imhof et al., 2017), the efficiency of corporate acquisition (Chen et al., 2018), corporate cash holdings (Habib et al., 2017), labor investment efficiency (Zhang et al., 2020), and earnings management (Sohn, 2016). Studies also suggest that comparability affects a firm's cost of bank loans (Fang et al., 2016) and the cost of public debt (Chen et al., 2015; Kim et al., 2013). Our study draws on the aforementioned research to provide a new perspective on the comparability-debt relationship by integrating the two components of a firm's debt: bank debt and public debt.

The paper is laid out as follows. Section 2 reviews the literature and develops the hypotheses. Section 3 describes the data. Section 4 reports the main regression results, while section 5 covers the robustness tests. Section 6 presents cross-sectional regression results. Section 7 concludes the study.

2. Review of literature and Hypotheses Development

Two lines of literature are relevant for this study: the first that considers the firm's debt choice issue and the second that focuses on the implications of financial statements comparability.

2.1. Debt Choice

An extensive body of the theoretical literature on financial intermediation indicates that corporate debt choice is primarily driven by the information asymmetry issue (Berlin and Loeys, 1988; Boyd and Prescott, 1986; Denis and Mihov, 2003; Diamond, 1984, 1991; Fama, 1985; Hoshi et al., 1993; Nakamura, 1991). When there is concern about asymmetric information, two fundamental issues occur. *The first* is adverse selection, which occurs before completing a financial contract. *The second* is moral hazard, which occurs once the deal is struck. *On the one hand*, higher levels of adverse selection prompt lenders to become more cautious in assessing the actual situation of the firm and distinguish good borrowers from bad ones (Stiglitz and Weiss, 1981). Thus, this is mainly exercised to avoid diverting funds to projects or expenses other than those mentioned in the loan agreement. Therefore, in the absence of reliable and high-quality public disclosures, lenders may charge all loan applicants a high cost of debt, even though this decision will penalize qualified borrowers (Halov and Heider, 2011). In such a case, banks appear to be far more equipped than arm's length lenders to address these adverse selection concerns, as banks have access to the firm's private information and can accurately analyze its claims (Bharath et al., 2008; Diamond, 1984). As a result, when a firm suffers a high cost of adverse selection, such as being underestimated by lenders, it chooses to use less information-sensitive lenders (i.e., banks) rather than more information-sensitive lenders (i.e., public lenders).

On the other hand, the main argument underlying moral hazard models is that after obtaining the loan, managers may be tempted to engage in fraudulent practices, either to extract private benefit (Almazan and Suarez, 2003; Hoshi et al., 1993) or to favor shareholders to the detriment of lenders (Jensen and Meckling, 1976; Myers, 1977). To deter managers from such practices, lenders must be able to ensure effective monitoring. In this respect, banks appear to be better equipped than arm's length lenders. Indeed, it is obvious that a single financial intermediary can better manage the monitoring task than a group of scattered individual lenders as the financial intermediary can pool all the resources needed for monitoring, allowing it to avoid free-rider problems and effort duplication issues at lower costs. Conversely, the higher the monitoring expenses lenders must bear, the more likely they will pass these costs on to the borrower. Therefore, when confronting a high level of moral hazard, firms will prefer to substitute more information-sensitive lenders, such as public lenders, with less information-sensitive ones, such as private lenders (Denis and Mihov, 2003).

2.2. Financial Statement Comparability

Although comparability of the firm's financial reports produces informational benefits by facilitating the access, processing, and analysis of publicly available data, it also presents possible costs through information losses related to the firm's idiosyncratic features. In this respect, Fang et al. (2017) show that better financial statements comparability has a bright side consisting in a greater "spillover informativeness," i.e., information from the correlated accounting measurements between firms, and a dark side as it reduces "standalone informativeness," i.e., the firm's own reporting precision.

However, prior literature documents a net positive effect of higher comparability on the firm's information environment for banks and credit rating agencies. It shows that financial statement comparability lowers information asymmetries by mitigating both adverse selection and moral hazard concerns. As for adverse selection concerns, previous studies consider that improved financial statement comparability leads to a substantial decrease in the information collection and processing costs for analysts, investors, debtholders, and other market participants by lowering the time-consuming reconciliation of differences in

accounting standards and reinforcing both the quality and the amount of public disclosure provided by the firm (Gordon and Gallery, 2012; Kim et al., 2018). Thus, enhancing comparability should enable market participants to better benchmark the firm's achievements with its local and foreign peers, consequently better gauge a firm's relative performance before they undertake their decisions (Habib et al., 2017; Kim et al., 2013, 2018). Hence, it is well-evidenced that higher comparability alleviates insiders' information advantage as well as adverse selection concerns (Barth et al., 2012; Shane et al., 2014). Accordingly, pre-existent literature documents that financial statement comparability improves sell-side analysts' forecast accuracy (De Franco et al., 2011), reduces creditors' uncertainty and risk (Kim et al., 2013), enhance cross-border investments (DeFond et al., 2011; Wang, 2014) and efficiency of corporate acquisition (Chen et al., 2018).

Furthermore, previous studies argue that greater comparability should deter managers from engaging in contentious practices that could harm shareholders and creditors, thus decreasing moral hazard concerns. Indeed, improved comparability leads to less time-consuming and potent monitoring by outsiders who have an additional mean to appraise the firm's performance through a more effective comparison of a firm's financial statements with that of its peers. Hence, in the presence of more comparable financial statements, managers are less likely to adopt egregious practices such as engaging in earnings management and bad news hoarding behaviors. Indeed, prior studies show that financial statement comparability reduces firms' firm-specific crash risk (Kim et al., 2016), cost of equity capital (Imhof et al., 2017), credit risk (Kim et al., 2013), and accruals manipulation (Sohn, 2016).

2.3. Hypotheses Development

Our earlier discussion suggests that informational benefits arising from financial statement comparability alleviate adverse selection and moral hazard problems. Because credit markets are more incomplete than equity markets, mainly because lower competitiveness and liquidity, we anticipate information asymmetry to play a significant role in lending decision-making. Intuitively, financial statement comparability is beneficial to both banks and bondholders. Nevertheless, these two

groups of lenders may assess these benefits differently. Therefore, we develop two competing hypotheses linking financial statement comparability with debt choice.

With regard to the first hypothesis, we argue that bondholders tend to benefit from more comparable financial statements by making relevant interpretations about economic resemblances and divergences across comparable firms. Thus, comparability allows bondholders to extract relevant information to comprehend better how the firm performance is induced by economic events, which improves their decision-making. The idea is even more confirmed since the overwhelming proportion of U.S. outstanding bonds are held by institutional investors and direct household participation hit a record low of only 1.3% in 2016, according to a study carried out by St. Louis Federal Reserve⁶. This implies that bondholders are almost well-equipped as banks to adequately analyze comparable financial statements and deduce the relevant required information for an effective credit quality assessment. Consequently, a higher level of comparability in financial statements is likely to reduce the credit risk for bondholders, allowing them to lower the overall cost of debt. In the light of the above, we expect that banks' advantage over debtholders in terms of information processing and monitoring will erode if firms (i.e., borrowers) improve their financial statement comparability. This would make private debt less attractive and public debt less expensive. In such a setting, we predict a positive association between a firm's financial statements comparability and its reliance on public debt.

H_{1a}: Firms with higher comparability display a higher (lower) reliance on public debt (bank debt) in their debt structure.

Nevertheless, some counterforces could put the above prediction into question. Indeed, we argue that better comparability often comes along with nontrivial costs as it hinders a certain firm's specific information (Fang et al., 2017). In such a context, as a quasi-insider, banks are clearly more advantaged than bondholders to overcome this problem while continuing to benefit from easily comparable public information. Therefore, compared to bondholders, it is easier for them to price firms' claims accurately. This advantage is all the more valuable when the hidden firm's idiosyncratic information gains more weight. Indeed, when firms produce and

⁶ <https://www.stlouisfed.org/on-the-economy/2017/october/what-types-financial-assets-people-hold>

disclose more comparable financial statements, it is obvious that they will focus on common features with other firms at the expense of their specific characteristics. This non-disclosed yet valuable private information is more accessible to banks than bondholders. Therefore, it becomes more likely that the firm will turn to banks for financing than the bond market. For instance, Fang et al. (2016) study the syndicated loan market and document that financial statement comparability enables the lead lenders to keep lesser quotas of the loan while attracting more lenders, therefore allowing a faster loan syndication process^{7,8}. Consequently, firms with higher comparable financial statements tend to rely more on bank debt compared to public one. Taken together, we argue that banks are better equipped than bondholders to tap the full benefits of financial statement comparability, which allows them to offer lower interest rates and relax loan conditions.

Consequently, firms with higher comparable financial statements tend to rely more on bank debt compared to public one. Therefore, we hypothesize that:

H_{1b}: Firms with higher comparability display a higher (lower) reliance on bank debt (public debt) in their debt structure.

3. Research design

3.1. Sample and data

This empirical analysis covers the sample over the 2001 to 2018 period. We source debt choice data from Standard & Poor's Capital IQ. Comparability scores are computed using the approach of De Franco et al. (2011)⁹. Financial data are drawn from Compustat North America. We exclude observations for firms from the financial (SIC codes 6000–6999) and the utility (SIC codes 4900–4999) sectors. We then remove observations with missing debt structure, comparability scores, and the control variables. Finally, we exclude firms with a single observation since keeping them would overestimate statistical significance and underestimate standard errors

⁷ The syndicated loan market has experienced a lightning rise over the last few decades. Syndicated loans account for more than half of all corporate financing in the United States (Thomson Reuters 2015).

⁸ Sufi (2007) shows that, in presence of high information asymmetry, lead lenders tend to withhold major portion of the syndicated loan to signal their commitment to other participating lenders.

⁹ <https://mitmgmtfaculty.mit.edu/rverdi/>

(Correia, 2015). The final sample contains 14,872 observations representing 2,412 publicly traded firms over the 2001 to 2018 period.

3.2. Key variables

3.2.1. Debt structure data

S&P Capital IQ provides detailed debt structure data for more than 60,000 global public and private companies worldwide with history from the mid-1990s. S&P Capital IQ database reports 21 key characteristics of debt components, such as security type, issued currency, maturity date, interest rate, interest type, and more. We follow previous research (e.g., Ben-Nasr, 2019; Boubaker et al., 2018) and focus on the ratio of bank loans (i.e., the sum of revolving credit, term loans, and commercial paper) to total debt and the ratio of corporate bonds (i.e., the sum of senior and subordinated bonds and notes) to total debt to apprehend a firm's choice between private and public debt.

3.2.2. Comparability data

We follow De Franco et al. (2011) to measure accounting comparability between two firms i and j belonging to the same industry. The inherent rationale of comparability is that if two firms adopt more comparable accounting, they should lead to closer outcomes when they face similar economic events. Based on De Franco et al. (2011), *Returns*, the quarterly stock return, is used as a proxy for the economic event while firm's *Earnings*, computed as the quarterly net income before extraordinary items, is used for the accounting outcome. We go through three steps to build the comparability measure.

First, we regress the firm's *Earnings* on its contemporaneous *Returns* using the previous 16 quarters

$$Earnings_{it} = \alpha_i + \beta_i \times Return_{it} + \varepsilon_{it} \quad (1)$$

The coefficient estimates from Equation (1), $\hat{\alpha}_i$ and $\hat{\beta}_i$, are the accounting system parameters reflecting economic events in firm i 's financial statements. Similarly, $\hat{\alpha}_j$ and $\hat{\beta}_j$ are specific of firm j and proxy for its accounting function.

In a second step, we calculate the predicted earnings of firm i using the parameter estimates of the accounting function of firm i and firm j , as follows

$$E(Earnings)_{iit} = \hat{\alpha}_i + \hat{\beta}_i \times Return_{it} \quad (2)$$

$$E(Earnings)_{ijt} = \hat{\alpha}_j + \hat{\beta}_j \times Return_{it} \quad (3)$$

$E(Earnings)_{iit}$ is the predicted earnings of the firm i given the accounting function parameters of the same firm i . $E(Earnings)_{ijt}$ is the predicted earnings of the firm i given the accounting function parameters of the firm j .

Lastly, we calculate the financial statements comparability between firms i and j as the average absolute difference between the expected earnings estimated, over the last 16 last quaretrs, from equations (2) and (3)

$$Comparability_{ijt} = -\frac{1}{16} \times \sum_{t-15}^t |E(Earnings)_{iit} - E(Earnings)_{ijt}| \quad (4)$$

Greater values indicate higher accounting comparability between these two firms i and j .

After estimating comparability scores for each firm i -firm j combination within the same two-digit standard industry classification, all $Comparability_{ijt}$ scores are aggregated for each firm i to build a firm-year measure of accounting comparability. More specifically, all $Comparability_{ijt}$ for each firm i are ranked from the highest to lowest. Thereafter, we follow De Franco et al. (2011) and use $CompAcctInd$, the median of $Comparability_{ijt}$ for firm i for all firms in firm's i industry, as the measure of financial statements comparability. For the regression analyses, we use both continuous and decile rank comparability measures.

3.2.3. Control variables

In line with previous literature, we control for a set of firm attributes that determine firms' debt choice decision (Ben-Nasr et al., 2021; Boubaker et al., 2018; Denis and Mihov, 2003; Houston and James, 1996). These controls allow us to estimate the incremental effect of the firm's comparability on its debt choice decision. In particular, we control for the natural logarithm of total assets (*Size*) since larger firms have a higher debt capacity and lower level of information asymmetry, reducing transaction costs when public debt is issued (Blackwell and Kidwell 1988; Houston and James 1996). We also include financial leverage, measured as total liabilities over total assets (*Leverage*). It is possible that highly-leveraged firms would like to avoid bank-monitored financing (Diamond, 1991). However, firms with higher leverage

may also rely on bank debt to shelter themselves from creditors' control. Firms with higher profitability enjoy a better reputation and tend to issue more public debt (Denis and Mihov, 2003; Diamond, 1991). Therefore, we control for *PROFITABILITY* measured as operating income before depreciation and amortization scaled by total assets. Firms with higher tangible assets prefer public debt to bank debt (Denis and Mihov, 2003). Accordingly, we include the ratio of net property, plant, and equipment to total assets (*TANGIBILITY*). We include *Tobin's Q*, measured as the sum of the market value of equity and book value of debt scaled by total assets since growth firms rely less on bank debt (Diamond, 1991). We control for bankruptcy risk (*ALTMAN Z-score*) because firms with a higher likelihood of bankruptcy either use a higher ratio of bank debt (Denis and Mihov, 2003) or substitute away from private to public debt to avoid cash-flow-based financial covenants of bank loans (Roberts and Sufi, 2009; Sufi, 2009). Finally, we control for time and industry fixed effects, respectively, using dummy variables. We provide variable definitions in the Appendix.

3.3. Descriptive statistics

Table 1 reports the descriptive statistics of the variables. We find that public debt represents 50.78% of firms' total debt, while bank loans cover 38.99%, suggesting that our sample firms have greater recourse on public debt than bank loans. The mean (median) accounting comparability score is -2.699 (-1.88) with a standard deviation of 2.639. The firms in our sample are, on average, large, exhibit moderate growth, and have negative profitability.

Table III. 1. Descriptive Statistics

This table reports the mean, standard deviation (SD), 5th percentile (5%), 25th percentile (25%), median, 75th percentile (75%), and 95th percentile (95%) for the variables used in our main tests. The sample covers 14,872 firm-year observations for 2,412 unique firms over the 2001 to 2018 period, for our analyses of the impact of accounting comparability on the firm's debt choice. All variables are defined in Appendix A.

	N	Mean	STD	5 th percentile	25 th percentile	50 th percentile	75 th percentile	95 th percentile
Dependent Variables								
<i>Public debt</i>	14,872	38.993	44.132	0	0	10.621	100	100
<i>Bank debt</i>	14,872	50.778	44.642	0	0	61.585	98.98	100
Variables of interest								
<i>CompAcctInd</i>	14,872	-2.699	2.639	-7.92	-3.12	-1.88	-1.15	-.63
<i>Rank_CompAcctInd</i>	14,872	.548	.287	.1	.3	.5	.8	1
Control Variables								
<i>Size</i>	14,872	6.721	2.111	3.272	5.169	6.699	8.163	10.37
<i>Leverage</i>	14,872	22.547	17.402	.402	8.821	20.161	32.298	56.025
<i>Tobin's Q</i>	14,872	1.975	1.244	.85	1.207	1.593	2.282	4.522
<i>Profitability</i>	14,872	-.007	.186	-.382	-.011	.041	.077	.148
<i>Tangibility</i>	14,872	.536	.415	.072	.22	.415	.761	1.34
<i>Zscore</i>	14,872	.9	3.427	-5.076	.76	1.683	2.455	3.639
<i>Debt rating</i>	14,872	.385	.487	0	0	0	1	1
<i>Invest grade</i>	14,872	.192	.394	0	0	0	0	1

The Pearson correlation coefficients are reported in Table 2. We observe that *CompAcctInd* and *Rank_CompAcctInd* are positively and significantly correlated with the public debt ratio ($p < 0.01$), while this is negatively and significantly correlated with the ratio of the bank loan. Overall, correlations between variables are in accordance with our predictions and existing studies.

Table III. 1. Pearson Correlations

This table contains Pearson correlation coefficients of key variables of interest. The sample covers 14,872 firm-year observations for 2,412 unique firms for the period spanning 2001 through 2018. The superscripts asterisk * refers to statistical significance at the 1% level. Appendix A provides the variable definitions.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) <i>Public debt</i>	1.000											
(2) <i>Bank debt</i>	-0.797* (0.000)	1.000										
(3) <i>CompAcctInd</i>	0.053* (0.000)	-0.030* (0.001)	1.000									
(4) <i>Rank_CompAcctInd</i>	0.094* (0.000)	-0.055* (0.000)	0.686* (0.000)	1.000								
(5) <i>Size</i>	0.498* (0.000)	-0.393* (0.000)	0.269* (0.000)	0.329* (0.000)	1.000							
(6) <i>Leverage</i>	0.294* (0.000)	-0.127* (0.000)	-0.074* (0.000)	-0.049* (0.000)	0.243* (0.000)	1.000						
(7) <i>Tobin</i>	0.002 (0.840)	-0.070* (0.000)	-0.011 (0.207)	0.077* (0.000)	-0.091* (0.000)	-0.064* (0.000)	1.000					
(8) <i>Profitability</i>	0.077* (0.000)	-0.020 (0.029)	0.471* (0.000)	0.386* (0.000)	0.351* (0.000)	-0.053* (0.000)	-0.147* (0.000)	1.000				
(9) <i>Tangibility</i>	0.018 (0.049)	0.030* (0.001)	-0.046* (0.000)	-0.045* (0.000)	0.032* (0.000)	0.161* (0.000)	-0.182* (0.000)	0.050* (0.000)	1.000			
(10) <i>Zscore</i>	0.026* (0.004)	0.031* (0.001)	0.458* (0.000)	0.335* (0.000)	0.313* (0.000)	-0.074* (0.000)	-0.259* (0.000)	0.759* (0.000)	0.051* (0.000)	1.000		
(11) <i>Debt rating</i>	0.514* (0.000)	-0.407* (0.000)	0.125* (0.000)	0.170* (0.000)	0.733* (0.000)	0.364* (0.000)	-0.101* (0.000)	0.202* (0.000)	0.103* (0.000)	0.167* (0.000)	1.000	
(12) <i>Invest grade</i>	0.426* (0.000)	-0.360* (0.000)	0.225* (0.000)	0.275* (0.000)	0.673* (0.000)	0.113* (0.000)	0.013 (0.164)	0.214* (0.000)	0.037* (0.000)	0.178* (0.000)	0.687* (0.000)	1.000

4. Main analysis: Comparability-Debt Choice Relation

4.1. Model Specification

We start by running the regression model below to assess the relationship between comparability and debt choice:

$$y_{it} = a_0 + \beta_1 \text{Comparability}_{it} + \sum \gamma'_k X_{kit} + \text{Industry dummies} + \text{Year dummies} + \varepsilon_{it} \quad (5)$$

where y_{it} is the ratio of bank (public) debt to total debt. $\text{Comparability}_{it}$ is measured by *CompAcctInd*, at time t . X_{kit} are ($K \times 1$) vectors of firm-level controls at time t . We include industry and year effects to control for unobservable debt choice factors. Regression equations are estimated using the ordinary least squares (OLS) model. In the sensitivity analyses, we use six alternative regression models. Standard errors are clustered by firm and year levels. We are particularly attentive to the effect of *CompAcctInd* on a firm's public (bank) debt ratio.

4.2. Baseline Results

Table 3 presents the regression estimates of Equation (5). We run eight specifications using the OLS technique. Columns (1) to (4) report results using continuous measures of comparability, whereas columns (5) to (8) report results using decile rank of comparability.

4.2.1. Comparability and public debt

The results of the regression of the firm's public debt ratio on its comparability score are reported in Panel A (Table 3). We run the regression in Column (1) that includes firm-level controls but not the industry and year dummies. We observe that the coefficient on *CompAcctInd* is positive and significant at the 1% level, implying that firms with higher accounting comparability tend to rely more on bond debt to finance their activities. This finding suggests that firm's managers believe that their firm is likely to benefit more from their accounting comparability, in terms of debt conditions, if they borrow from the public debt market rather than from banks. In columns (2)–(4), we gradually add year fixed effects, industry fixed effects, and then both jointly.

Coefficient estimates on *CompAcctInd* remain positive, statistically significant, and very close to each other in terms of magnitude. In columns (5)–(8), we repeat the regressions using the decile rank of comparability (*Rank_CompAcctInd*) and continue to observe a positive and significant coefficient on *Rank_CompAcctInd* ($p < 0.01$).

Economically, the estimated coefficient on *CompAcctInd* in Column (4) indicates that an increase of one-standard-deviation in the firm's accounting comparability results in a 12.89% increase in the ratio of public debt to total debt relative to the mean (estimated as $(2.043 \times 2.461) / 0.389$). Similarly, the coefficient on *Rank_CompAcctInd* in Column (8) indicates an 6.59% increase in public debt for a one standard deviation increase in comparability (estimated as $(11.28 \times 0.287) / 0.389$). The evidence suggests that the positive influence of accounting comparability on public debt proportion is economically meaningful and statistically significant.

Regarding the firm-specific controls, the coefficient estimates are generally in line with the existing literature. For instance, the coefficient on firm size and Tobin's Q are positive and significant, revealing that larger firms with higher growth opportunities are more likely to substitute away from bank loans to public-debt instruments to raise funds (Boubaker et al., 2018; Denis and Mihov, 2003; Nakamura, 1991). Regression results also show a positive association between the firm's leverage and its reliance on public debt financing (Denis and Mihov, 2003).

4.2.2. Comparability and bank debt

The results of the regression of the firm's bank debt ratio on its comparability score are reported in Panel B (Table 3). We follow the same estimation approach as used for public debt. Results in columns (1)–(4) show that the coefficient on *CompAcctInd* is negative and significant at the 1% level, regardless of the inclusion of time and industry effects. This result reveals that highly comparable firms are likely to shift away from bank debt to finance their activities. In columns (5)–(8), we repeat the regressions using the decile rank of comparability (*Rank_CompAcctInd*) and continue to observe a negative and significant coefficient on *Rank_CompAcctInd* ($p < 0.01$). Concerning the economic significance, the estimated coefficient on *CompAcctInd* in Column (4) suggests that a one-standard-deviation increase in the

firm's accounting comparability leads to a 8.61% decrease in the ratio of bank debt to total debt relative to the mean (estimated as $(1.779 \times 2.461) / 0.508$). Similarly, the coefficient on *Rank_CompAcctInd* in Column (8) indicates a 2.07% decrease in bank debt for a one standard deviation increase in comparability (estimated as $(3.665 \times 0.287) / 0.508$).

Overall, table 3 provides robust evidence that firms with comparable financial statements use more (less) bank (public) debt, supporting our hypothesis (1a).

Table III. 2. The impact of accounting comparability on debt choice**Panel A. Public debt**

This table presents the regression results for the impact of accounting comparability on a firm's debt choice. The dependent variable is public (bank) debt to total debt in panel A (panel B). Columns (1)–(4) report results using *Comp.AcctInd*, the continuous measure of comparability, whereas columns (5)–(8) report results using *Rank_CompAcctInd*, the decile rank of comparability. Year fixed effects and Industry fixed effects are first added separately, then jointly, to the regression in columns (2), (3), and (4), for the continuous measure of comparability, and columns (6), (7), and (8), for the decile rank measure of comparability, respectively. Sample period: 2001–2018. The robust *t*-statistic is reported beneath each coefficient estimate. The superscripts asterisks ***, **, and * refers to statistical significance at the 1%, 5%, and 10% levels, respectively. Appendix A provides the variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Comp.AcctInd</i>	1.891*** (12.359)	2.119*** (13.793)	1.795*** (11.575)	2.043*** (13.105)				
<i>Rank_CompAcctInd</i>					5.973*** (4.937)	9.708*** (7.707)	5.078*** (4.291)	8.974*** (7.255)
<i>Size</i>	11.391*** (71.64)	11.427*** (71.9)	11.314*** (71.037)	11.339*** (71.202)	11.033*** (69.191)	10.996*** (68.873)	11.006*** (68.75)	10.963*** (68.367)
<i>Leverage</i>	.43*** (21.729)	.453*** (22.894)	.409*** (20.413)	.435*** (21.722)	.435*** (21.919)	.459*** (23.116)	.413*** (20.515)	.44*** (21.853)
<i>Tobin's Q</i>	.57** (1.997)	.462 (1.61)	1*** (3.426)	.915*** (3.108)	.725** (2.524)	.52* (1.802)	1.204*** (4.103)	1.032*** (3.493)
<i>Profitability</i>	.013 (.435)	-.002 (-.074)	.021 (.707)	.006 (.21)	.067** (2.257)	.046 (1.533)	.07** (2.343)	.048 (1.607)
<i>Tangibility</i>	5.953*** (7.811)	5.613*** (7.375)	-1.229 (-1.233)	-1.751* (-1.765)	5.278*** (6.902)	4.973*** (6.509)	-2.357** (-2.358)	-2.822*** (-2.841)
<i>Zscore</i>	-1.541*** (-9.217)	-1.659*** (-10.03)	-1.539*** (-8.866)	-1.653*** (-9.637)	-1.224*** (-7.314)	-1.347*** (-8.108)	-1.277*** (-7.336)	-1.414*** (-8.183)
<i>Debt rating</i>	16.266*** (16.245)	15.186*** (15.202)	15.708*** (15.798)	14.712*** (14.842)	15.604*** (15.518)	13.669*** (17.005)	14.914*** (15.938)	12.584*** (16.041)
<i>Invest grade</i>	14.781*** (16.729)	13.753*** (15.537)	14.633*** (16.387)	13.612*** (15.211)	15.251*** (16.268)	12.147*** (14.061)	13.518*** (15.041)	11.922*** (14.094)
<i>Constant</i>	43.327*** (41.075)	43.914*** (41.809)	46.535*** (42.344)	47.145*** (42.953)	34.69*** (29.872)	32.79*** (27.802)	38.864*** (31.697)	36.821*** (29.535)
Observations	14872	14872	14872	14872	14872	14872	14872	14872
Adj R ²	.285	.295	.325	.335	.278	.289	.319	.329
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Industry FE	No	No	Yes	Yes	No	No	Yes	Yes

Panel B. Bank debt

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>CompAcctInd</i>	-1.631*** (-10.023)	-1.865*** (-11.464)	-1.531*** (-9.261)	-1.779*** (-10.758)				
<i>Rank_CompAcctInd</i>					-.284 (-.222)	-4.036*** (-3.048)	-.275 (.216)	-3.665*** (-2.781)
<i>Size</i>	-10.397*** (-63.754)	-10.439*** (-64.48)	-10.35*** (-62.913)	-10.382*** (-63.579)	-10.137*** (-61.563)	-10.107*** (-61.637)	-10.125*** (-60.953)	-10.091*** (-61.019)
<i>Leverage</i>	-.022 (-1.068)	-.046** (-2.265)	-.003 (-.15)	-.031 (-1.512)	-.026 (-1.257)	-.049** (-2.424)	-.005 (-.264)	-.033 (-1.606)
<i>Tobin's Q</i>	-2.252*** (-7.557)	-2.181*** (-7.314)	-2.449*** (-7.867)	-2.397*** (-7.687)	-2.562*** (-8.503)	-2.386*** (-7.915)	-2.777*** (-8.853)	-2.63*** (-8.369)
<i>Profitability</i>	.056* (1.726)	.064** (1.977)	.061* (1.829)	.068** (2.076)	-.013 (-.404)	.001 (.018)	-.003 (-.092)	.012 (.359)
<i>Tangibility</i>	-4.815*** (-6.039)	-4.4*** (-5.544)	.54 (.493)	1.255 (1.153)	-4.028*** (-5.031)	-3.693*** (-4.633)	1.833* (1.669)	2.422** (2.22)
<i>Zscore</i>	1.794*** (9.956)	1.967*** (11.067)	1.747*** (9.344)	1.924*** (10.433)	1.458*** (8.07)	1.636*** (9.153)	1.45*** (7.707)	1.649*** (8.859)
<i>Debt rating</i>	-15.951*** (-16.325)	-14.636*** (-15.029)	-16.233*** (-16.575)	-14.98*** (-15.368)	-14.052*** (-18.005)	-14.962*** (-15.882)	-17.118*** (-16.081)	-15.082*** (-14.277)
<i>Invest grade</i>	-12.531*** (-14.878)	-11.219*** (-13.338)	-12.426*** (-14.368)	-11.072*** (-12.822)	-13.985*** (-13.176)	-13.841*** (-13.057)	-11.317*** (-16.106)	-10.128*** (-10.046)
<i>Constant</i>	40.479*** (36.492)	39.875*** (36.245)	37.908*** (32.187)	37.234*** (31.792)	45.529*** (37.281)	47.426*** (38.138)	42.085*** (32.039)	44.082*** (33.013)
<i>Observations</i>	14872	14872	14872	14872	14872	14872	14872	14872
<i>Adj R²</i>	.189	.207	.215	.232	.183	.2	.21	.227
<i>Year FE</i>	No	Yes	No	Yes	No	Yes	No	Yes
<i>Industry FE</i>	No	No	Yes	Yes	No	No	Yes	Yes

4.3. Alternative Regression Methods

First, to address the concern with firm-level unobserved heterogeneity, we include firm fixed effects regression model in Column (1) of Table 4. Then, we replace the contemporaneous accounting comparability measure in Equation (5) with its lagged measure in Column (2). We do so because a firm's debt choice can hardly affect past levels of comparability, which partially mitigates the reverse causality concern. Third, we use a Tobit regression in Column (3) to alleviate the concern that our OLS estimates are statistically unsound as long as our dependent variable is bordered between 0 and 1. We also use Fama-Macbeth regression (Column 4), weighted least square regression (Column 5), and generalized estimation equation (GEE) regression (Column 6). Results reported in Table 4 show that the sign and significance of accounting comparability remain qualitatively similar, supporting our main outcomes in Table 3.

Table III. 3. Alternative regression methods

Panel A. Public debt

This table presents the regression results for the impact of accounting comparability on a firm's debt choice. The dependent variable is public (bank) debt to total debt in panel A (panel B). We use the *CompAcctInd*, as the firm's comparability measure. Firm fixed effects are added in Column (1), while the lagged comparability is used to measure the firm's accounting comparability in Column (2). Tobit, Fama MacBeth, weighted least squares, and generalized estimation equation regressions' results are reported in columns (3)–(6), respectively. Sample period: 2001–2018. The robust *t*-statistic is reported beneath each coefficient estimate. The superscripts asterisks ***, **, and * refers to statistical significance at the 1%, 5%, and 10% levels, respectively. Appendix A provides the variable definitions.

	(1) FFE	(2) Lagged	(3) Tobit	(4) FMB	(5) WLS	(6) GEE
<i>CompAcctInd</i>	.529** (2.232)		2.555*** (7.421)	1.891*** (9.262)	1.921*** (40.73)	1.694*** (10.685)
<i>Lag_comparability</i>		1.395*** (8.585)				
<i>Size</i>	3.877*** (4.732)	11.415*** (68.325)	15.634*** (17.577)	11.4*** (32.129)	9.904*** (103.66)	9.528*** (29.052)
<i>Leverage</i>	.334*** (11.776)	.418*** (19.407)	.755*** (16.943)	.44*** (14.066)	.314*** (49.735)	.379*** (17.635)
<i>Tobin's Q</i>	-.596 (-1.59)	.874*** (2.705)	.306 (.48)	.95** (2.887)	.329*** (3.632)	.338 (1.164)
<i>Profitability</i>	.022 (.7)	.117*** (3.702)	.126** (2.188)	.016 (.454)	.044*** (5.214)	.044* (1.662)
<i>Tangibility</i>	-.965 (-4.75)	-2.519** (-2.407)	.515 (.167)	-1.731 (-1.252)	3.288*** (8.063)	1.238 (.895)
<i>Zscore</i>	-.405 (-1.201)	-1.794*** (-9.657)	-1.925*** (-4.117)	-1.772*** (-10.811)	-1.191*** (-18.42)	-1.285*** (-6.662)
<i>Debt rating</i>	15.544*** (16.013)	15.373*** (14.819)	28.4*** (14.623)	17.074*** (17.905)	15.091*** (15.007)	21.306*** (18.117)
<i>Invest grade</i>	14.338*** (16.153)	14.157*** (15.177)	9.19*** (4.593)	15.033*** (16.807)	14.805*** (15.748)	12.663*** (11.318)
<i>Constant</i>	46.756*** (30.835)	46.517*** (39.41)	60.635 (1.019)	0 (.)	74.258*** (14.4)	70.9*** (3.814)

<i>Observations</i>	14830	12852	14872	14872	14872	14872
<i>Adj R²</i>	.399	.351	-	-	-	-
<i>Year FE</i>	Yes	Yes	Yes	No	Yes	Yes
<i>Industry FE</i>	No	Yes	Yes	Yes	Yes	Yes
<i>Firm FE</i>	Yes	No	No	No	No	No

Panel B. Bank debt

	(1) FFE	(2) Lag	(3) Tobit	(4) FMB	(5) WLS	(6) GEE
<i>CompAcctInd</i>	-.260** (-2.225)		-2.397*** (-5.311)	-1.657*** (-7.686)	-1.624*** (-32.602)	-1.435*** (-8.421)
<i>Lag_comparability</i>		-1.073*** (-6.149)				
<i>Size</i>	-1.979** (-2.427)	-10.553*** (-61.158)	-12.941*** (-10.563)	-10.493*** (-23.598)	-8.67*** (-87.703)	-7.938*** (-22.889)
<i>Leverage</i>	-.059** (-2.076)	-.028 (-1.267)	-.125** (-2.113)	-.03 (-1.246)	-.017*** (-2.597)	-.04* (-1.748)
<i>Tobin's Q</i>	-.105 (-.274)	-2.338*** (-6.752)	-3.075*** (-3.504)	-2.518*** (-8.247)	-1.249*** (-13.039)	-1.36*** (-4.35)
<i>Profitability</i>	-.02 (-.618)	-.045 (-1.249)	-.114 (-1.474)	.07 (1.634)	-.022** (-2.47)	-.024 (-.85)
<i>Tangibility</i>	-2.522 (-1.174)	1.695 (1.463)	-6.124 (-1.535)	1.176 (.801)	-4.59*** (-10.703)	-2.131 (-1.441)
<i>Zscore</i>	-.141 (-.415)	2.139*** (10.463)	1.806*** (2.836)	1.981*** (9.337)	1.367*** (20.148)	1.307*** (6.337)
<i>Debt rating</i>	-16.628*** (-17.683)	-16.611*** (-16.519)	-25.292*** (-11.564)	-15.404*** (-18.227)	-15.928*** (-17.803)	-18.205*** (-19.930)
<i>Invest grade</i>	-12.924*** (-15.216)	-12.464*** (-13.862)	-9.418*** (-3.988)	-11.872*** (-16.073)	-12.118*** (-14.334)	-10.772*** (-6.052)
<i>Constant</i>	41.304*** (25.906)	38.897*** (30.625)	-65.385 (-.761)	0 (.)	16.84*** (3.192)	20.314 (1.043)
<i>Observations</i>	14830	12852	14872	14872	14872	14872
<i>Adj R²</i>	.335	.353	-	-	-	-
<i>Year FE</i>	Yes	Yes	Yes	No	Yes	Yes
<i>Industry FE</i>	No	Yes	Yes	Yes	Yes	Yes
<i>Firm FE</i>	Yes	No	No	No	No	No

5. Endogeneity of comparability and firm's debt choice

As in similar studies, our results might be disfigured by the endogeneity problem. For example, one can argue that our findings, documented so far, are driven by firm-level unobserved heterogeneity that might jointly affect the firm's accounting comparability and its debt choice. In this particular instance, prior studies have established that the firm's accounting quality, which largely depends on managerial discretion, is associated with both firm's accounting comparability (Barth et al., 2012; Chen and Gong, 2019) and its sources of debt (Ahmed et al., 2002; Wittenberg-Moerman, 2008). While the firm's accounting comparability is seemingly exogenous to the managerial discretion, we pursue a set of additional tests to handle any possible endogeneity issues.

5.1. Additional Control Variables

The results hitherto exposed show that higher accounting comparability is more likely to be associated to more reliance on public debt compared to bank debt. This section includes additional controls to the initial model to guarantee that our findings are not led by the omission of potentially relevant variables. Particularly, we include (i) product market competition (*fluidity*) (Hoberg et al., 2014) and (ii) institutional shareholding (*institutional*) as additional control variables. We base our choice on previous studies establishing that higher product market competition and institutional shareholdings are likely to be associated with higher public debt proportion (Boubaker et al., 2018).

Table 5 reports results for specifications that control for these two additional variables. We begin by including each of these variables separately, and then we include them together in columns (3) and (6). Results reported in all six columns reinforce our prior findings since the coefficient estimates of *CompAcctInd* remain positive and significant at the 1% level. We attain qualitatively equivalent findings when the decile value of comparability is used in the regression

Table III. 4. Additional Control Variables

This table reports results from regressing the firm's public (bank) debt ratio to total debt on comparability scores (*CompAcctInd*) and controls. We include two additional control variables (i) fluidity, a proxy for product market competition, and (ii) institutional, the percentage of firm's shares held by institutions. All regressions are estimated with year and industry-fixed effects. Sample period: 2001–2018. The robust *t*-statistic is reported beneath each coefficient estimate. The superscripts asterisks ***, **, and * refers to statistical significance at the 1%, 5%, and 10% levels, respectively. Appendix A provides the variable definitions.

	<i>Public debt</i>			<i>Bank debt</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>CompAcctInd</i>	.619*** (2.767)	1.657*** (9.405)	1.701*** (9.478)	-.356 (-1.499)	-1.591*** (-8.563)	-1.593*** (-8.500)
<i>Size</i>	4.137*** (4.867)	10.034*** (43.333)	10.093*** (43.558)	-2.312*** (-2.732)	-9.432*** (-42.492)	-9.38*** (-42.369)
<i>Leverage</i>	32.609*** (11.36)	.503*** (19.543)	.493*** (19.071)	-4.735 (-1.639)	-.061** (-2.328)	-.045* (-1.731)
<i>Tobin's Q</i>	-.556 (-1.488)	.692* (1.844)	.199 (.522)	-.13 (-.341)	-2.366*** (-5.881)	-1.81*** (-4.514)
<i>Profitability</i>	.012 (.402)	.042 (1.094)	5.888 (1.524)	-.012 (-.378)	.037 (.857)	.866 (.203)
<i>Tangibility</i>	-.779 (-3.77)	-.813 (-6.34)	-2.141* (-1.665)	-2.63 (-1.207)	1.256 (.888)	2.064 (1.453)
<i>Zscore</i>	-.389 (-1.209)	-1.936*** (-7.922)	-2.024*** (-8.188)	-.072 (-.22)	2.261*** (9.022)	2.418*** (9.632)
<i>Debt rating</i>	14.09*** (13.045)	14.72*** (14.736)	15.32*** (15.795)	-15.628*** (-14.04)	-16.104*** (-15.83)	-16.449*** (-17.51)
<i>Invest grade</i>	13.487*** (15.229)	15.071*** (15.905)	14.356*** (16.178)	-10.860*** (-15.628***)	-11.074*** (-16.104***)	-12.959*** (-16.449***)
<i>Fluidity</i>	.158 (1.039)		.447*** (3.204)	-.224 (-1.454)		-.523*** (-3.584)
<i>institutional</i>		6.845*** (3.915)	8.324*** (4.61)		-2.503 (-1.382)	-5.306*** (-2.850)
<i>Constant</i>	45.946*** (25.714)	42.953*** (23.999)	41.172*** (20.509)	42.268*** (22.532)	36.767*** (19.674)	39.91*** (19.193)
Observations	14555	9804	9656	14555	9804	9656
Adj R ²	.297	.308	.327	.256	.204	.223
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

5.2. Within-firm accounting quality

To further address the endogeneity concern, we include financial reporting quality as a new control variable in this section. Indeed, it is pertinent to distinguish between accounting comparability and accounting quality when examining the relationship between a firm's financial statement comparability and its debt choice. A firm's specific accounting quality is contingent on the relevance and faithful representation of one firm's financial statements (i.e., a "within-firm" accounting quality), which is under managers' discretion. On the contrary, a firm's accounting comparability is a "between-firm" accounting quality and is based on comparisons of financial statements between multiple firms belonging to the same industry (i.e., beyond managerial discretion). Prior studies show the potential benefits of a firm's accounting quality on reducing costs of bank loans (Wittenberg-Moerman, 2008) and public debt (Ahmed et al., 2002). Studies also suggest a significant and positive correlation between a firm's accounting quality and comparability (Barth et al., 2012; Chen and Gong, 2019). Consequently, it is would be appropriate to control in Equation (5) for firm specific accounting quality.

Closely following Chen and Gong (2019) and Imhof et al. (2017), we propose three measures for firm specific accounting quality. The first one is based on the absolute value of discretionary accruals (Dechow et al., 2010; Kothari et al., 2005). We start by computing the discretionary accruals as the residuals from the following regression of the firm's total accruals:

$$TA_t = \alpha + \beta_1 \Delta SALE_t + \beta_2 PPEGT_t + \beta_3 OIADP_t + \varepsilon \quad (6)$$

where TA is total accruals measured as the net income before continuing operations minus operating cash flows, all scaled by beginning-of-year total assets. $\Delta SALE$ is the change in sales compared to the previous year, deflated by beginning-of-year total assets, $PPEGT$ is the gross property, plant, and equipment, scaled by the total assets value at beginning-of-year, and $OIADP$ is the operating income after depreciation, divided by beginning-of-year total assets.

We run the regression for Equation (6) for all firm-year observations with at least five observations per firm, then use the absolute value of the residuals as a proxy for the firm's management ability to manipulate earnings. Finally, we multiply the

absolute value by -1 to obtain AQ_1 , our first measure of accounting quality. Higher values of AQ_1 indicate higher accounting quality.

Our second measure is based on Dechow and Dichev (2002) and uses the standard deviation of the residuals of the following equation

$$TCA_t = \alpha_t + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta SALE_t + \beta_5 PPEGT_t + \varepsilon_t \quad (7)$$

where TCA is the total current accruals measured as the one-year change in current assets minus current liabilities minus cash plus short-term debt, CFO is the operating cash-flows, deflated by beginning-of-year total assets, $\Delta SALE$ is the change in sales from the prior year, deflated by beginning-of-year total assets; and $PPEGT$ is the gross property, plant, and equipment, deflated by beginning-of-year total assets.

We run the regression for Equation (7) by firm, subject to a minimum of four consecutive firm-year observations. Then, the standard deviation of the residuals is computed over the previous four years. Finally, every firm-year standard deviation is multiplied by -1 to obtain AQ_2 , the second measure of firm specific accounting quality. As per AQ_1 , higher values of AQ_2 denote higher specific accounting quality for the firm.

Our third measure, AQ_3 , is earnings persistence (P. Dechow et al., 2010), obtained from the regression of the following equation

$$Earnings_t = \alpha + \beta \cdot Earnings_{t-1} + \varepsilon_t \quad (8)$$

where $Earnings$ is the income before extraordinary items, deflated by beginning-of-year total assets. Equation (8) is estimated by firm presenting at least three observations. The earnings persistence is captured by the beta coefficient estimate. Higher values of AQ_3 match up with higher accounting quality.

First, we add AQ_1 , AQ_2 , and AQ_3 separately to Equation (5), then we incorporate them jointly in the regression. The regression results reported in Table 6 are qualitatively similar to those previously reported in Table 3, indicating that our main conclusions are not driven by omitted ‘within-firm’ accounting quality.

Table III. 5. Endogeneity Treatment: Within-firm accounting quality

This table reports the results of our main regression of the firm's ratio of public (bank) debt to total debt on comparability scores (*CompAcctInd*) after controlling for within-firm accounting quality. More particularly, three measures of accounting quality are added to the regression baseline model, first separately, then jointly. Coefficients estimates are reported for the bank debt ratio through columns (1)–(4) and for the public debt ratio through columns (5)–(8). Sample period: 2001–2018. The robust *t*-statistic is reported beneath each coefficient estimate. The superscripts asterisks ***, **, and * refers to statistical significance at the 1%, 5%, and 10% levels, respectively. Appendix A provides the variable definitions.

	<i>Public debt</i>				<i>Bank debt</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>CompAcctInd</i>	1.883*** (11.648)	1.939*** (9.434)	1.846*** (8.577)	1.811*** (7.935)	-1.602*** (-9.256)	-1.717*** (-7.846)	-1.634*** (-7.252)	-1.642*** (-6.88)
<i>AQ_1</i>	-2.349*** (-3.244)			9.227 (1.338)	1.679** (2.014)			-.874 (-1.08)
<i>AQ_2</i>		34.453*** (3.531)		52.995*** (4.436)		-32.184*** (-3.081)		-47.773*** (-3.337)
<i>AQ_3</i>			-.071 (-.622)	.073 (.316)			.04 (.348)	-.111 (-.48)
<i>Size</i>	11.82*** (69.45)	12.445*** (55.707)	12.315*** (59.861)	12.115*** (51.859)	-11.05*** (-62.803)	-11.955*** (-51.346)	-11.848*** (-55.977)	-11.835*** (-48.287)
<i>Leverage</i>	.383*** (16.744)	.312*** (10.513)	.297*** (10.149)	.285*** (8.974)	-.024 (-1.01)	.001 (.032)	.016 (.528)	.018 (.549)
<i>Tobin's Q</i>	.897** (2.542)	1.433*** (2.976)	1.23*** (2.648)	1.69*** (3.367)	-2.384*** (-6.368)	-2.739*** (-5.471)	-2.565*** (-5.183)	-2.877*** (-5.455)
<i>Profitability</i>	.043 (1.218)	-.011 (-.228)	.029 (.584)	-.018 (-.326)	.013 (.312)	.081 (1.461)	.07 (1.225)	.104 (1.617)
<i>Tangibility</i>	-.805 (-1.724)	-1.023 (-1.705)	-.2 (-.143)	-1.744 (-1.139)	-.45 (-.366)	-2.241 (-1.367)	-2.464 (-1.565)	-1.92 (-1.103)
<i>Zscore</i>	-1.76*** (-9.029)	-1.619*** (-6.718)	-1.51*** (-5.93)	-1.467*** (-5.337)	2.222*** (10.123)	2.211*** (7.706)	1.891*** (6.411)	1.897*** (5.762)
<i>Debt rating</i>	15.174*** (13.951)	16.322*** (10.706)	14.662*** (10.6)	15.572*** (10.017)	-16.794*** (-15.95)	-18.401*** (-12.425)	-17.013*** (-12.718)	-17.782*** (-11.778)
<i>Invest grade</i>	13.426*** (13.993)	11.884*** (9.171)	11.577*** (9.73)	11.724*** (8.878)	-11.876*** (-12.851)	-10.081*** (-7.992)	-9.651*** (-8.347)	-9.978*** (-7.769)
<i>Constant</i>	48.23*** (38.751)	50.011*** (29.26)	48.86*** (30.853)	51.923*** (28.038)	38.29*** (28.692)	39.25*** (21.629)	40.206*** (23.741)	38.541*** (19.415)
<i>Observations</i>	11234	6546	6909	5934	11234	6546	6909	5934
<i>Adj R²</i>	.373	.417	.405	.421	.276	.336	.327	.348
<i>Year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

5.3. Instrumental Variables

Even though the inclusions of additional control variables, as well as firm specific accounting quality in the regression model is expected to mitigate, to a large extent, the endogeneity concerns, we employ a two-stage instrumental variable model to further accommodate the concerns raised by potential endogeneity between the firm's accounting comparability and its debt choice. Our first instrumental is the percentage of peers within the two-digit SIC industry that engage the same audit firm as the focal firm (Kim et al., 2020; Lobo et al., 2018). Indeed, Francis et al. (2014) show that when the audit of two companies is conducted by the same Big 4 auditor, there is higher likelihood that these two companies will display higher comparability compared to when they are audited by two different Big 4 audit firms. For a given year, we expect that a firm should display higher accounting comparability when it belongs to an industry with a higher proportion of firms sharing the same auditor than her.

Our second instrumental variable is the number of peers operating in the same four-digit SIC industry as the focal firm (Chen and Gong, 2019). We argue that the number of firms belonging to the same industry is likely to impact a firm's accounting comparability in one of the two following ways. On the one hand, we can advocate for a positive association between the number of firms in the same industry and the accounting comparability since a larger number of firms may induce a higher likelihood for a firm to be comparable with other peers. On the other hand, a larger industry may be subject to higher heterogeneity, resulting in less accounting comparability.¹⁰ Conceptually, the proportion of firms sharing the same auditor as the contracting firm within the same industry and the number of peers belonging to the same industry are likely to be linked to one firm's comparability but unlikely to condition its debt choice.

Results are summarized in Table 7. The first stage regressions show that accounting comparability is negatively and significantly related to the proportion of same-industry peers sharing the same auditor and the number of peers operating in the same industry. The second stage regressions further corroborate the positive (negative) and highly significant relationship between a firm's accounting comparability and the proportion of public debt (bank debt) to

¹⁰ We use these instruments separately in the regression.

total debt. Moreover, we find that our estimation is not subject to under-identification and weak-instrument problems.

Table III. 6. Endogeneity Treatment: Instrument variables

This table reports the results of our main regression of the firm's ratio of public (bank) debt to total debt on comparability, using the error components two-stage least squares (EC2SLS) instrumental variables technique. More particularly, we use (i) the proportion of two-digit SIC industry peers using the same audit firm as the contracting firm, and (ii) the number of peers operating in the same four-digit SIC industry as the main firm as instruments for the firm's accounting comparability. Coefficients estimates are reported for the public (bank) debt ratio for the first and the second stage of the regression, respectively. Sample period: 2001–2018. The robust *t*-statistic is reported beneath each coefficient estimate. The superscripts asterisks ***, **, and * refers to statistical significance at the 1%, 5%, and 10% levels, respectively. Appendix A provides the variable definitions.

	Same industry			Same auditor		
	First stage	Second stage		First stage	Second_stage	
		<i>Public debt</i>	<i>Bank debt</i>		<i>Public debt</i>	<i>Bank debt</i>
<i>Comparability</i>		2.978***	−2.636**		4.124**	−6.135***
		(2.392)	(−2.033)		(2.392)	(−3.174)
<i>IV</i>	−.006*** (−14.286)			.018* (7.084)		
<i>Observations</i>	14872	14872	14872	14082	14082	14082
<i>R-squared</i>	-	.295	.207	-	.148	.261
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>p-value</i>	.000			.000		
<i>F-test of Excluded instruments</i>	204.305*** (p<0.01)			50.141*** (p<0.01)		
<i>Under-identification test (Kleibergen-Paap)</i>	200.162*** (p<0.01)			56.982*** (p<0.01)		
<i>Weak identification test (Cragg-Donald)</i>	216.275*** (p<0.01)			96.679*** (p<0.01)		

5.4. Two-step system G.M.M. approach

As a further endeavor to alleviate any still ongoing endogeneity concerns, we use a two-step system GMM estimation approach (Blundell and Bond, 1998), where we use lagged differences of the dependent variables as instruments in the level equations in addition to the lagged values of the dependent variable in the first differences (Baltagi, 2013). In the system GMM estimation, we use a two-step procedure proposed by Arellano and Bond (1991).

Table 8 presents the results of the two-step GMM. In columns (1) and (2), the estimated coefficients of the lagged public debt and lagged bank debt (*L.Publicdebt* and *L.bankratio*) are positive and statistically significant ($p < 0.01$), indicating our estimation does not reject the dynamic nature of the model. Moreover, our model does not suffer from serial correlation as the Arellano and Bond (1991) test for first-order correlation AR(1) is significant at 1 percent and second-order auto correlation AR(2) is statistically insignificant. The Hansen J test for overidentification restriction does not reject the null hypothesis that the instrument set is valid. Most especially, we observe that the estimate of the comparability coefficient is significantly positive for public debt (coefficient = 0.492; $p < 0.01$) while it is significantly negative for bank debt (coefficient = -0.649; $p < 0.01$), which corroborate our main regression results and further support our hypotheses.

Table III. 7. Endogeneity Treatment: System GMM approach

This table provides the regression results for the impact of accounting comparability on a firm's debt choice using the system GMM approach. The dependent variable is the proportion of public (bank) debt to total debt. We use the *CompAcctInd*, as the firm's comparability measure. Sample period: 2001–2018. The robust *t*-statistic is reported beneath each coefficients estimates. The superscripts asterisks ***, **, and * refers to statistical significance at the 1%, 5%, and 10% levels, respectively. Appendix A provides the variable definitions.

	(1)	(2)
<i>L.Public debt</i>	.714*** (26.511)	
<i>L.Bank debt</i>		.610*** (19.723)
<i>CompAcctInd</i>	.492*** (3.624)	-.649*** (-4.351)
<i>Size</i>	3.485*** (10.100)	-4.305*** (-11.566)
<i>Leverage</i>	.117*** (5.328)	.035* (1.662)
<i>Tobin's Q</i>	-0.147 (-.641)	-.896*** (-3.184)
<i>Profitability</i>	.020 (.838)	-.026 (-.920)
<i>Tangibility</i>	1.134 (1.509)	-2.030** (-2.473)
<i>Zscore</i>	-.452*** (-3.383)	-.771*** (4.311)
<i>Debt rating</i>	13.061*** (15.922)	-19.802*** (-17.641)
<i>Invest grade</i>	11.051*** (14.415)	-17.054*** (-20.142)
<i>Constant</i>	13.519*** (9.072)	15.025*** (9.586)
<i>Observations</i>	11796	11796
<i>Arellano-Bond AR(1)</i>	.000	.000
<i>Arellano-Bond AR(2)</i>	.953	0.970
<i>Over-identification Sargan test</i>	47.464***	22.643
<i>Over-identification Hansen test</i>	35.891***	15.489
<i>Exogeneity Hansen test</i>	.86	.24

6. Cross-sectional heterogeneity

6.1. The role of information asymmetry

While developing the hypotheses, we contend that a firm's accounting comparability influences debt choice through the informational channel. In particular, we claim that higher comparability is likely to mitigate information asymmetry, which allows firms to substitute away from bank loans to public debt. If this information asymmetry-based argument holds, the positive relation between comparability and public debt is likely to be more accentuated when information asymmetry becomes more severe. In a similar token, one should observe that the negative association between accounting comparability and bank debt is more accentuated in the presence of heightened information asymmetry.

To test the above conjecture, we use two variables that capture the firm-specific information asymmetry. These include (i) analyst coverage (*Analysts*), and (ii) the probability of informed trading (*PIN*). Our choice is motivated by prior literature that shows the importance of analyst coverage in reducing firm-specific information asymmetry. For instance, Frankel and Li (2004) show that firms subject to higher analyst coverage display less information asymmetry between insiders and outsiders. Furthermore, Yu (2008) shows that when firms are followed by more analysts, managers are less likely to engage in earnings management. We use the *PIN* to measure information asymmetry, which has been widely used in the literature (Easley and O'hara 2004; Easley et al., 2002; Odders-White and Ready 2008; Vega 2006). Higher *PIN* values are associated with higher adverse selection, hence higher information asymmetry.¹¹

The analysis results are summarized in Table 9. Columns (1) and (2) exhibit how the influence exerted by accounting comparability on the use of public debt is moderated by information asymmetry. We introduce two dummy variables to our regression. *high* is a dummy variable that takes the value of one if the firm's proxy of

¹¹ PIN scores are made publicly available for the period 1993-2010. See <https://terpconnect.umd.edu/~stephenb/>

information asymmetries, i.e., analysts following and PIN, is above the median of the distribution, and zero otherwise. Similarly, *low* is a dummy variable that takes the value of one if the firm's proxy of information asymmetries is below the median of the distribution, and zero otherwise. Accordingly, *high*=1 corresponds to a more severe (moderate) information asymmetry when the PIN (analysts following) is used as a proxy. Results clearly establish that the comparability effect is more pronounced in presence of severe information asymmetry. For example, the comparability coefficient's estimate of firms being followed by less financial analysts (more information asymmetry) loads positive and significantly higher than the comparability coefficient estimate of firms being followed by more analysts. The same is true for firms displaying higher PIN (more information asymmetry) compared to those with lower PIN. Regression results in columns (1) and (2) thus indicate the influence of comparability on the use of public debt is stronger when there is a more severe information asymmetry.

Columns (3) and (4) exhibit how the influence exerted by the firm's accounting comparability on its reliance on bank debt financing is moderated by information asymmetry. The coefficients estimate suggests that the negative relationship between accounting comparability and bank debt is more pronounced in the presence of lower analyst following and higher PIN. Overall, our cross-sectional analyses suggest that accounting comparability is more valuable in the presence of higher information asymmetry.

Table III. 8. Cross-sectional heterogeneity: The role of information asymmetry

This table examines the impact of information asymmetry on the relationship between firms' accounting comparability and their debt choice. Columns 1 and 2 report the regression results for public debt, while columns 3 and 4 report results for bank debt. In columns 1 and 3, we consider the number of analysts following a firm. We consider the probability of informed trade (PIN) in columns 2 and 4, respectively. We use *high (low)* as a dummy variable that takes the value of one if the firm's asymmetry information proxy is above (below) the median of the distribution, and zero otherwise. Sample period: 2001–2018. The robust *t*-statistic is reported beneath each coefficient estimate. The superscripts asterisks ***, **, and * refers to statistical significance at the 1%, 5%, and 10% levels, respectively. Appendix A provides the variable definitions.

	Public debt		Bank debt	
	(1) Analysts	(2) PIN	(3) Analysts	(4) PIN
<i>CompAcctInd*high</i>	1.443*** (4.408)	2.1*** (8.908)	-1.061*** (-3.162)	-1.813*** (-7.447)
<i>CompAcctInd*low</i>	1.908*** (7.859)	.92** (2.52)	-1.666*** (-6.447)	-.921** (-2.403)
<i>Size</i>	11.209*** (40.413)	9.979*** (40.309)	-10.117*** (-36.926)	-8.954*** (-35.982)
<i>Leverage</i>	.598*** (21.169)	.538*** (18.805)	-.14*** (-4.831)	-.092*** (-3.174)
<i>Tobin's Q</i>	.785* (1.946)	.35 (.794)	-2.369*** (-5.522)	-1.953*** (-4.233)
<i>Profitability</i>	.056 (1.169)	.042 (.926)	.013 (.238)	-.012 (-.259)
<i>Tangibility</i>	-2.04 (-1.333)	-3.936*** (-2.68)	1.896 (1.206)	5.502*** (3.574)
<i>Zscore</i>	-1.146*** (-3.417)	-2.461*** (-8.352)	1.578*** (4.245)	2.79*** (9.261)
<i>Debt rating</i>	14.703*** (9.178)	9.905*** (6.539)	-19.236*** (-12.482)	-8.323*** (-5.838)
<i>Invest grade</i>	13.486*** (7.219)	15.39*** (11.823)	-10.896*** (-6.128)	-13.861*** (-11.441)
<i>Constant</i>	50.128*** (32.688)	49.551*** (29.932)	33.278*** (20.344)	31.535*** (18.349)
<i>High-low (p-value)</i>	.093	.000	.059	.012
Observations	8020	7772	8020	7772
Adj R ²	.334	.307	.215	.206
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

6.2. The role of financing constraints

We next examine how financing constraints could possibly affect the influence exerted by the firm's financial statement comparability on its debt choice. Prior studies suggest that financing constraints of the firms play a major part in building their debt structures (e.g., Denis and Mihov, 2003). Given that firms with financing constraints are generally associated with the poor financial condition, bondholders are less likely to lend them money. Accordingly, firms facing more financing constraints are expected to rely more on bank loans to finance their needs. As a result, we predict the positive (negative) relationship between comparability and public debt (bank debt) should be more pronounced for firms facing more financing constraints.

To test the above prediction, we use three proxies to capture financing constraints. These include (i) firm size (*Size*), (ii) HP index (*HPI*), and (iii) WW index (*WWI*). Our choice is motivated by prior literature that suggests that large firms enjoy an easier access to external financing (Farre-Mensa and Ljungqvist, 2016; Faulkender and Petersen, 2006). Moreover, the HP index (Hadlock and Pierce, 2010) and WW index (Whited and Wu, 2006) measure the degree of financial constraints and are widely accepted in the literature. Higher *HPI* and *WWI* correspond to higher levels of financing constraints.

The main findings are reported in Table 10. Columns (1)–(3) present the results of the regression of the firm's public debt proportion on its accounting comparability, depending on the levels of financing constraints. We create a dummy variable *high (low)* that takes the value of one if the financing constraints proxy is above (below) the median of the distribution, and zero otherwise. In line with our initial regression, the coefficient of comparability loads positive and statistically significant ($p < 0.01$) for highly financially constrained firms and for firms displaying less constraints as well. We are particularly interested in comparing the coefficients estimates of comparability between these two sets of firms. In Column (1), we find that the coefficient of *CompAcctInd*low* is significantly higher than *CompAcctInd*high* ($p < 0.01$), suggesting that the role of accounting comparability on public debt becomes more valuable for small firms that are facing more financing constraints. In the same line, regression

results reported in columns (2) and (3), for respectively the HPI and the WWI, show that the coefficients on *CompAcctInd*high* are higher than *CompAcctInd*low*, indicating that financing constraints strengthen the association between the firm's financial statement comparability and its public debt financing.

Columns (4)–(6) show how financing constraints influence the relationship between accounting comparability and bank debt. The interaction coefficients indicate the negative association between the firm's bank debt ratio and its accounting comparability is less salient for large firms, while more salient for firms with a higher financing constraints index.

Table III. 9. Cross-sectional heterogeneity: The role of financial constraints

This table examines the impact of financial constraints on the relationship between firms' accounting comparability and their debt choice. Columns 1 to 3 report the regression results for public debt, while columns 4 and 6 report results for bank debt. In columns 1 and 4, we consider the size of the firm. We consider the Hadlock and Pierce index (HPI) in columns 2 and 5. Finally, we consider the White and Wu index (WWI) in columns 3 and 6. We use *high (low)* as a dummy variable that takes the value of one if the firm's financial constraints proxy is above (below) the median of the distribution, and zero otherwise. Sample period: 2001–2018. The robust *t*-statistic is reported beneath each coefficient estimate. The superscripts asterisks ***, **, and * refers to statistical significance at the 1%, 5%, and 10% levels, respectively. Appendix A provides the variable definitions.

	Public debt			Bank debt		
	(1) <i>Size</i>	(2) <i>HPI</i>	(3) <i>WWI</i>	(4) <i>Size</i>	(5) <i>HPI</i>	(6) <i>WWI</i>
<i>CompAcctInd*high</i>	1.158*** (5.129)	2.042*** (11.541)	1.826*** (10.399)	-.882*** (-4.04)	-1.819*** (-9.415)	-1.757*** (-8.77)
<i>CompAcctInd*low</i>	2.35*** (13.46)	1.203*** (5.874)	1.695*** (8.343)	-2.09*** (-11.041)	-1.16*** (-6.028)	-1.562*** (-8.219)
<i>Size</i>	10.807*** (57.321)	10.601*** (54.637)	10.906*** (56.535)	-9.842*** (-50.768)	-9.759*** (-49.267)	-10.14*** (-51.547)
<i>Leverage</i>	.428*** (21.211)	.475*** (21.554)	.486*** (22.092)	-.024 (-1.152)	-.051** (-2.243)	-.06*** (-2.665)
<i>Tobin's Q</i>	.937*** (3.187)	.749** (2.355)	.722** (2.26)	-2.42*** (-7.762)	-2.227*** (-6.57)	-2.266*** (-6.661)
<i>Profitability</i>	-.006 (-.21)	.012 (.384)	.023 (.723)	.081** (2.455)	.071** (2.025)	.063* (1.777)
<i>Tangibility</i>	-1.911* (-1.926)	-3.299*** (-3.068)	-3.238*** (-2.988)	1.417 (1.303)	2.832** (2.4)	2.859** (2.406)
<i>Zscore</i>	-1.694*** (-9.887)	-1.716*** (-9.41)	-1.675*** (-9.049)	1.965*** (10.683)	1.939*** (10.023)	1.846*** (9.429)
<i>Debt rating</i>	14.006*** (31.108)	14.814*** (32.042)	13.657*** (31.337)	-16.006*** (-14.075)	-17.153*** (-16.025)	-17.831*** (-16.093)
<i>Invest grade</i>	12.849*** (21.339)	11.272*** (19.056)	11.419*** (19.816)	-12.752*** (-11.328)	-11.147*** (-9.632)	-12.037*** (-10.226)
<i>Constant</i>	46.966*** (42.903)	47.636*** (40.476)	47.669*** (40.251)	37.417*** (32.049)	35.876*** (28.587)	35.917*** (28.472)
<i>High-low (p-value)</i>	.000	.000	.567	.000	.005	.411
<i>Observations</i>	14872	12748	12613	14872	12748	12613
<i>Adj R²</i>	.336	.331	.33	.234	.226	.225
<i>Year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes	Yes	Yes

7. Conclusion

We explore the influence that might be exerted by the firm's financial statement comparability on its debt choice decision. We develop two competing hypotheses in linking comparability with debt choice. Conducting an empirical analysis on a sample of 14,872 observations over 2001–2018, we document a significantly positive relationship between the firm's financial statements comparability and the proportion of public debt to total debt. We also find that firms displaying higher comparability rely less on bank debt. These findings remain robust after controlling for firm specific financial reporting quality. We show that the inferences from our analysis are unaffected when alternative regression models are employed. We also check and establish that endogeneity problems do not drive our findings. Cross-sectional analyses show that the positive relationship between comparability and public debt is more pronounced for informationally opaque and financially constrained firms.

Our study contributes to both financial statement comparability and debt choice literature. Previous studies show that accounting comparability is viewed favorably in debt contracting, such as borrowing money from banks (Fang et al., 2016) or issuing public debt instruments (Kim et al., 2013). Our study shows that, all else being equal, managers of firms displaying higher comparability scores are expected to substitute away from the bank to public debt, providing evidence that comparability is more valuable when issuing bonds rather when negotiating loans' contract terms with banks. Our study also provides new insight into the debt choice literature. We provide direct evidence that financial statement comparability allows firms to gain access to public debt markets.

Appendix

Appendix III. 1. Variable definitions and sources

Variable	Definition	Source
Dependent variables		
<i>Bank debt</i>	Bank debt over total debt. Bank debt is defined as the sum of term loans and revolving credit, and total debt is defined as the sum of short-term and long-term debt.	Capital IQ
<i>Public debt</i>	Public debt over total debt. Public debt is defined as the sum of commercial paper, subordinated bonds and notes, senior bonds and notes. Total debt is defined as the sum of short-term and long-term debt.	Capital IQ
Explanatory variables		
<i>CompAcctInd</i>	A measure for financial statements comparability estimated from Equations (1)–(4). Comparability scores are ranked by industry and then <i>CompAcctInd</i> is computed as the median value of all comparability scores.	Rodrigo Verdi Data Library
<i>Rank_CompAcctInd</i>	A decile rank for financial statements comparability estimated from <i>CompAcctInd</i> .	Authors' calculation based on Rodrigo Verdi Data Library
Control variables		
<i>Size</i>	Natural logarithm of total assets in US dollars (millions)	Compustat
<i>Leverage</i>	Sum of long-term debt and debt in current liabilities, divided by total assets	Same as above
<i>Tobin's Q</i>	Sum of the market value of equity and book value of debt, divided by total assets	Same as above
<i>Profitability</i>	Income before extraordinary items divided by total assets.	Same as above
<i>Tangibility</i>	Total property, plant, and equipment divided by total assets	Same as above
<i>Z-score</i>	Altman's (1968) Z-score, calculated as $(1.2 \times \text{working capital} + 1.4 \times \text{retained earnings} + 3.3 \times \text{earnings before interest and taxes} + 0.999 \times \text{sales}) / \text{total assets} + 0.6 \times (\text{market value of equity} / \text{book value of debt})$.	Same as above
<i>Debt rating</i>	Dummy variable that takes one if the firm has an S&P long-term debt rating.	Capital IQ
<i>Invest grade</i>	Dummy variable that takes one if the firm has an investment-grade S&P long-term rating.	Same as above
Variables used in robustness tests		
<i>Fluidity</i>	A text measure of product market competition based on the product descriptions found in firms' 10-K filings. The higher the similarity between a firm's own words vector and its rivals' words vector, the higher the competitive pressure.	Hoberg and Phillips Data Library
<i>Institutional</i>	the ownership stake in a company that is held by large financial organizations, pension funds, or endowments	Thomson Reuters

<i>AQ_1</i>	A measure for within-firm accounting quality based on Equation (6). We use the absolute value of the residuals as a proxy for the firm's management ability to manipulate earnings. Finally, we multiply the absolute value by -1 to obtain <i>AQ_1</i> .	Authors' calculation based on Compustat data
<i>AQ_2</i>	A measure for within-firm accounting quality based on the regression of Equation (7). We compute the standard deviation of the residuals, and then we multiply it by -1 to obtain <i>AQ_2</i> .	Same as above
<i>AQ_3</i>	A measure for within-firm accounting quality based on the regression of Equation (8). <i>AQ_3</i> is captured by the beta coefficient estimate.	Same as above
<i>Analysts</i>	The number of analysts following the firm at year <i>t</i> .	I/B/E/S International
<i>PIN</i>	The probability of informed trading.	Stephen Brown Data Library
<i>HPI</i>	The Hadlock and Pierce (2010) index measures firms' financial constraints calculated as $-0.737 \cdot \text{Assets} + 0.043 \cdot \text{Assets}^2 - 0.040 \cdot \text{Age}$.	Authors' calculation based on Compustat data
<i>WWI</i>	The Whited and Wu (2006) Index, a measure of firms' financial constraints calculated as follows: $-0.091 \cdot (\text{Cash flow to total assets}) - 0.062 \cdot \text{Dummy_dividend} + 0.021 \cdot \text{Long term debt} - 0.044 \cdot \ln(\text{Assets}) + 0.102 \cdot \text{Industry sales growth} - 0.035 \cdot \text{Firm's sales growth}$.	Same as above

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Chapter IV

ESSAY 3: Financial Statement Readability and Firm's Debt choices

1. Introduction

The information asymmetry is detrimental to the appropriate allocation of resources in the capital markets (Akerlof 1978; Spence 1978, 2002; Stiglitz 2002). Existing literature suggests that better disclosure should reduce information asymmetry and alleviate the firm's burden to increase transparency and thus enhance credibility with investors. The ensuing effects reflect higher liquidity levels (Kim and Verrecchia 1994; Welker 1995), lower monitoring costs (Leuz and Verrecchia 2000), and lower financing sources (Armstrong et al. 2011; Lambert, Leuz, and Verrecchia 2012). Nevertheless, disclosure can be mandatory or voluntary; in the first case, it encompasses financial statements, footnotes, management discussions, and analyses, while in the second stance, it implicates qualitative information such as conference calls, press briefings and websites. Among all these alternatives, 10-K annual reports remain one of the most popular and effective firms disclosure channels. In addition to financial statements and other quantitative aspects, the textual component represents an average of 80% of the 10-K annual reports (F. Li 2010; Lo, Ramos, and Rogo 2017). This high percentage is worth commenting on as it drew on the importance of improving the quality of narrative disclosures to moderate and alleviate information asymmetry.

Given the critical role of the narrative component, policymakers and regulators have consistently encouraged firms to simplify the readability of their financial disclosures, including their 10-K reports. For instance, in 1998, the U.S. Securities and

Exchange Commission (SEC) issued "*A Plain English Handbook: How to Create Clear SEC Disclosure Documents*," where firms are required to follow the guidelines when preparing and presenting their 10-k reports. The primary purpose is to standardize the financial information and produce highly readable and concise information that serves as a relevant basis for end-users to build upon their investment's decisions and valuation strategies. In 2008, the SEC adopted a similar rule to mutual funds.

This substantial effort put in by regulators and practitioners witnesses an extensive interest in the academic and scientific fields over the last decade. The availability of quantitative and readability measures such as the Flesch-Kincaid index, the Gunning Fog index, and the Bog index initiated the curiosity and appetite of researchers to conduct thorough analyses on the said subject. Previous empirical studies established that improved readability leads to decreased information asymmetry, affecting firms' strategic decisions. For instance, Li (2008) found that low-earnings firms have more challenging annual reports to read and analyze, while firms with persistent profitability are more apt to produce high-quality annual reports. Biddle, Hilary, and Verdi (2009) document a positive association between improved readability and investment efficiency. Other studies show that low readability could be attributed to (i) a decrease in investor trading activity (Lawrence 2013; Miller 2010) and (ii) analysts' scrutiny to decipher the firm's reports when their relative forecasted earnings diverge from realized ones (Lehavy, Li, and Merkley 2011).

Meanwhile, Loughran and McDonald (2014) show that low readable 10-K filings are significantly associated with higher volatility of returns. On the other hand, Ertugrul et al. (2017) find that firms with annual reports that suffer from low readability are subject to stricter terms of bank loan contracts and are associated with a higher probability of stock price crash. On the other hand, Hwang and Kim (2017) provide evidence that firms suffering from lower readability are more likely to trade at significant discounts, while Bonsall and Miller (2017) demonstrate that lower readability is associated with a less favorable firm rating, a higher gap in the bond ratings, as well as a higher cost of debt.

This study contributes to the ongoing efforts to enhance understanding of the interactions between a firm's financial disclosures readability and financial policy

issues. More precisely, we propose to investigate the association between readability and firms' debt choices. The existing literature has established that information asymmetry is one of the main precursors of a firm's debt alternatives. Concurrently, the financial statement's readability implores the firm's informational environment, which would subsequently constitute an information-based channel that will impact the firm's debt choices. Our main arguments are supported by previous studies that have concluded that the public debt is more information-sensitive than bank loans (Berlin and Loeys 1988; Boyd and Prescott 1986; Chemmanur and Fulghieri 1994; Denis and Mihov 2003; Diamond 1984, 1991; Fama 1985; Hoshi, Kashyap, and Scharfstein 1993; Nakamura 1991). Thus, in the presence of high information asymmetry, firms tend to substitute issuing bonds with bank loans. Several empirical studies support this reasoning and validate that costly disclosures jeopardize firms' competitive positioning and lead to more protective strategy and secrecy. Therefore, it is more likely to raise external funds from banks instead of addressing financial markets (Blackwell and Kidwell 1988; Boot 2000; Fama 1985; Nakamura 1991). Besides, more information asymmetry means a greater tendency of managers to engage in fraudulent practices that could harm the interests of other stakeholders, particularly shareholders and creditors. Banks play the role of the effective monitor as they have more priority than bondholders and are not concerned by the free-rider problem. In as much, the occurrence of moral hazard risk leads firms to more rely on bank loans while deterring managers' misconduct (Almazan and Suarez 2003; Boubaker, Rouatbi, and Saffar 2017; Boubaker, Saffar, and Sassi 2018; Diamond 1984, 1991; Hoshi, Kashyap, and Scharfstein 1993; Houston and James 1996).

Based on the above discussed, we supposedly argue that better readability is associated with less reliance on bank debt. To empirically validate this hypothesis, we use Bog Index as the primary measure of readability (Bonsall and Miller 2017; Hasan 2020; Rjiba et al. 2021). By examining a sample of 16,532 firm-year observations of U.S. firms for 2001-2018, we document a significant negative relationship between readability and the bank debt proportion. More specifically, an increase in one standard deviation of readability is associated with a decrease of 1.144 points in the firm's bank debt ratio. These findings are confirmed by a battery of robustness tests, using alternative measures of readability and different regression specifications,

controlling for the firm-level structural complexity, and using the Plain Writing Act (PWA) as a quasi-natural experiment to alleviate endogeneity concerns.

Next, we examine how the relationship between a firm's readability and its debt structure may vary in a cross-section of firms. We find that the negative relationship between comparability and bank debt is more pronounced in the context of high information asymmetry. This latter variable was proxied as the probability of informed trade (PIN), credit rating, institutional ownership, and market competitive pressure based on analysts. We also find that the negative relationship between readability and bank debt is eccentric in the presence of higher financing constraints proxied by firm size and the following indices: H.P. (Hadlock and Pierce, 2010), K.Z. (Kaplan and Zingales 1997), and W.W. (Whited and Wu, 2006).

The remainder of the paper is structured as follows. Section 2 summarizes the background literature and develops the primary hypotheses while the data, sample, variables, and research design are described in Section 3. Section 4 reports the significant regression results, discusses the robustness tests and the findings of cross-sectional regressions. Finally, section 5 concludes the paper.

2. Review of literature and Hypotheses Development

Two lines of research intersect in this study – the firm's debt choices policy and the economic implications of the firms' disclosures, particularly the readability of its annual reports. In what follows, we propose a review of the leading research activities that have marked these two axes.

2.1. Debt choice

The existing literature argues that the informational channel is one of the most critical determinants of the firm's debt choices. Indeed, both theoretical and empirical studies show that firms' financing through public debt is more information-sensitive than bank debt. In this respect, we can identify three main streams of information-based models: information-production, proprietary information, and monitoring models.

In the context of the information-production models, previous papers stipulate that issuing public debt is more expensive than obtaining bank loans (Blackwell and Kidwell 1988; Fama 1985; Hadlock and James 2002; Nakamura 1991). Relatively, the bank can access the firm's data and information less expensively (Berlin and Loeys 1988; Boyd and Prescott 1986). According to SEC rules, issuing public debt is more expensive and requires additional disclosures (Blackwell and Kidwell 1988). The empirical evidence supports the theoretical predictions by documenting a positive association between the public debt of the firm and its size (Denis and Mihov 2003; Houston and James 1996; Johnson 1997; Krishnaswami, Spindt, and Subramaniam 1999). It was also demonstrated that banks would be more able to assess the firm's claims (Hadlock and James 2002).

On the other hand, the proprietary information models stipulate that it is in firms' best interest to hide and protect sensitive and strategic information that competitors can steal and might highly affect their competitive advantage (Campbell 1979). Thus, firms with valuable proprietary information are likely to rely more on bank financing (Campbell 1979; Yosha 1995). Nevertheless, the empirical evidence remains mixed and inconclusive. For example, some studies have documented a positive stock price reaction to a new bank debts agreement. This latter effect inherently preassumes that the firm holds valuable private information (Billett, Flannery, and Garfinkel 1995; Lummer and McConnell 1989; Preece and Mullineaux 1994). However, other papers highlighted that no abnormal yields were depicted following a new bank loan (Best and Zhang 1993) nor any adverse stock price reaction following the announcement of a non-bank debt (James 1987; Mikkelsen and Partch 1986).

The Moral hazard models stipulate that banks act as more effective monitors than bondholders. Indeed, bondholders are subject to the free-rider problem and are less affluent in monitoring resources. Conversely, banks concentrate the debt's ownership in the hands of one single party, which has more significant resources and easier access to private information (Petersen and Rajan 1995). As a result, the bank's monitoring effectively mitigates moral hazard issues by deterring managers from

engaging in practices that may harm shareholders and debtholders (Chemmanur and Fulghieri 1994; Fama 1985; Lin et al. 2013; Rajan 1992).

2.2. Narrative disclosure readability

The firm's disclosures are an essential communication tool between managers and outsiders. Traditionally, researchers have focused more on the numerical data disclosed by the firm. The textual disclosure did not receive an equally important consideration because of the difficulty quantifying and measuring such a narrative component. Recently, thanks to the development of new software and linguistics techniques, the research field soars around this vital topic. The emergence of big data analytics has enabled measuring the quality of textual disclosures for extensive data samples. As a result, abundant papers sprung up to examine the determinants of the readability of narrative disclosures and analyze the economic implications for different market players.

Bloomfield (2002) made a turning point in the research stream that has examined the firm's disclosures readability. By introducing the concept of the "Incomplete revelation hypothesis" (IRH), Bloomfield (2002) argues that the firm's managers tend to bury bad news in footnotes or poorly readable documents to manipulate the stock price and make the information processing convoluted for investors. Li (2008) brings empirical evidence corroborating this hypothesis. He documents that low-profit firms produce less readable disclosures in an effort by managers to obfuscate bad news and mislead external stakeholders. Conversely, firms with the most persistent positive earnings disclose the highest readable annual reports. In the same quest to identify the determinants of the readability of narrative disclosures, Hasan (2020) argues that best managers ensure superior performance to their firms and therefore are keener to implement highly readable disclosures. First, this is attributed to their will to reflect transparent disclosure and avoid the harmful effects of information asymmetry. Second, it is in the managers' interests to reveal their achievements and main contributions towards firms' value creation. The empirical evidence corroborates these assumptions and points out that better managerial ability is significantly and positively associated with better readability of narrative disclosures of 10-K reports.

Some studies have examined the implications of readability at the firm and market levels from an economic perspective. Biddle, Hilary, and Verdi (2009) evidenced that better readability facilitates managers' monitoring by shareholders, improving investment choices' efficiency. Loughran and McDonald (2014) argued that better readability improves valuation where they documented a negative association with stock price volatility. In the same vein, Hwang and Kim (2017) reported that investors develop a sense of distrust towards firms with lower readability disclosures and found that these firms are likely to trade at more significant discounts. Rjiba et al. (2021) showed that investors face a higher cost of information processing for firms with low readability disclosures that drive a surge in equity capital cost. Other papers focused on the impact of readability on the firm's debt. In this regard, Ertugrul et al. (2017) provide empirical evidence that banks tend to monitor firms with lower readability disclosures more strictly by imposing more stringent loan terms. For their part, Bonsall and Miller (2017) find that less readable financial disclosures are associated with a less favorable bond rating and a higher cost of debt.

In addition to its implications at the firm's level, readability also affects the decisions and behaviors of numerous market players. For instance, empirical evidence points out that less readable annual reports negatively and significantly impact the quality of analysts' reviews. As such, they need more time to analyze data, and thus the access to their reports will be more expensive. This will sometimes result in earnings forecast errors that will sharply vary between analysts and lead to higher forecast dispersion (Lehavy, Li, and Merkley 2011; Loughran and McDonald 2014). Other studies find that readability affects investors' behaviors and decisions in many ways. In this regard, You and Zhang (2009) showed that investors' underreaction to the firm's disclosures is more pronounced for less readable 10-K reports. Lawrence (2013) pointed out that investors with long-term policies, particularly buy-and-hold-ones, are more inclined to invest in more transparent firms which provide a higher degree of readable and more concise reports. For instance, Boubaker, Gounopoulos, and Rjiba (2019) proved that lower readability is associated with lower stock liquidity, as investors will become reluctant to read and analyze long 10-K reports. In other terms, the ambiguity and complication of the financial reports raise the informational risk and stand as a deterring barrier to their investments and trading strategies.

The overall findings from these studies suggest that readability significantly influences the firms' informational environment by lowering the information processing cost for external stakeholders, which turns into assuaging moral hazard concerns by preventing managers from opportunistic behaviors. Since the information asymmetries issue primarily affects the debt choices decisions, we assume that the firm's 10-K reports readability is significantly related to the firms' financing alternatives, whether public, private, or through bank loans. In the following sections, we provide our hypotheses supported by relevant theories and evidenced by previous empirical studies.

2.3. Readability and debt choices: hypothesis development

We use information asymmetries as a mediating channel through which the readability is likely to influence the firm's debt choices. The channel is twofold: (i) reducing the information processing cost, (ii) deterring managers from the obfuscation of bad news.

Following a plethora of previous research, lower readability was demonstrated to hinder the external stakeholders' efforts to analyze the firm's disclosures and properly extract relevant information. For instance, some studies claim that lower readability is mainly related to a psychological factor. Indeed, many investors prefer a less lengthy and less expensive information processing due to their inability and laziness to go over lengthy and complicated reports. This latter factor is tied up to investors' reluctance to initiate stock trading of firms with less readable 10-K reports (Boubaker, Gounopoulos, and Rjiba 2019; Lawrence 2013; Miller 2010). In parallel, prominent market players such as investment bankers, financial analysts, market screeners, professional experts, and auditors show less appetite to tackle low-quality financial reports with fewer narrative disclosures. This is because their ambiguity and complication impede the appropriate valuation and the fair assessment of the said firms. Empirical evidence corroborates this finding and showcases that it will lead to a higher probability of analysts' forecast errors, dispersion, and more disagreement between rating agencies for firms disclosing less readable 10-K reports (Bonsall and Miller 2017; Lehavy, Li, and Merkley 2011; Loughran and McDonald 2014). In the same context, the pecking order theory states that traditionally, external stakeholders

doubt the quality of firms that choose to raise funds on the financial markets (Myers and Majluf 1984). Therefore, firms with less readable narrative disclosures will fear that the increased ambiguity that could emerge from their annual reports will further fuel these suspicions and make them appear as poor-quality firms. Therefore, we expect firms to disclose less readable reports to avoid issuing bonds and forgo capital providers' penalties. Yet instead, such firms are inclined to less information-sensitive debt instruments, i.e., bank loans.

On the other hand, the incomplete revelation hypothesis (Bloomfield 2002) states that critical information extracted from firms' disclosures is not fully reflected in market prices. In turn, this could encourage managers to bury bad news in less readable reports to boost the stock price or delay adverse information discovery by external stakeholders. Thus, less readable disclosures could be a synonym of a more significant moral hazard, hence, greater distrust vis-à-vis the management of the firm. Empirical evidence corroborates the management obfuscation hypothesis by finding that firms with more readable narrative disclosures are those with more positive persistent earnings (F. Li 2008). On the contrary, firms with less readable textual disclosures display higher volatility returns (Loughran and McDonald 2014), a potential risk for stock prices crash, and face more restrictive lending conditions (Ertugrul et al. 2017).

In addition, previous work has shown that firms' disclosures are a crucial instrument for shareholders to monitor the firm's management (Bushman and Smith 2001; Lambert 2001). Nonetheless, low readability implores a hostile environment towards the provider of disclosures (Alter and Oppenheimer 2008; McGlone and Tofighbakhsh 2000), increasing the need for closer monitoring of the firm's management. In this respect, the existing literature has long highlighted the ability of banks to produce more effective monitoring than bondholders. Indeed, banks have more substantial resources, privileged access to private information, and a higher concentration of debt ownership. Such traits spare them from the free-rider problem that makes bondholders habitually disadvantaged (Chemmanur and Fulghieri 1994; Fama 1985; Lin et al. 2013; Rajan 1992). Given all the arguments above, we expect firms

with less readable disclosures to rely more on bank loans to ensure more effective monitoring and deter managers from engaging in fraudulent practices.

Given the considerations mentioned above, we state the following hypothesis (in alternative form)

H₁: Less readability is associated with greater reliance on bank debt financing.

3. Key variables, data, and descriptive statistics

This section describes the main variables in our analysis, the data, and the descriptive statistics.

3.1. Debt structure data

We follow previous studies on debt choices to model our analysis. In addition, we collect data related to debt structuring from the S&P Capital (I.Q.) database, which provides detailed data for over 60,000 global companies with historical data going back to 2001. The bank (public) debt ratio is equal to bank (public) debt over total debt. Bank debt is defined as the sum of term loans and revolving credit. Public debt is defined as the sum of subordinated bonds and notes and senior bonds and notes. Total debt is defined as the sum of all types of debts, including commercial paper, revolving credit, term loans, subordinated bonds and notes, senior bonds and notes, capital leases, and other debt.

3.2. Annual reports readability

We follow recent studies and base our primary measure of firms' narrative disclosures on the Bog Index¹² (Bonsall et al. 2017; Bonsall and Miller 2017; Ertugrul et al. 2017; Rjiba et al. 2021). Due to its construction methodology, the Bog Index offers a multidimensional measure of readability that captures a significant part of the plain English attributes of disclosure (e.g., sentence length, passive verbs, wordiness, word difficulty). The Bog score has three distinct components, Sentence Bog, Word Bog, and Pep. The first two components measure the difficulty of reading a document, while

¹² The Bog Index is reported by Editor Software's Stylewriter 4.

the third one captures factors that would facilitate the reading task. The calculation details of the Bog index are as follows:

$$Bog\ Index = Sentence\ Bog + Word\ Bog - Pep \quad (1)$$

Where

$$Sentence\ Bog = \frac{(Average\ Sentence\ Length)^2}{Long\ Sentence\ Limit} \quad (2)$$

$$Word\ Bog = \frac{(Style\ Problems + Heavy\ Words + Abbreviations + Specialist) \times 250}{Number\ of\ Words} \quad (3)$$

$$Pep = \frac{(Names + Interest\ Words + Conversational) \times 25}{Number\ of\ Words} + Sentence\ variety \quad (4)$$

$$Sentence\ variety = \frac{Standard\ Deviation\ of\ Sentence\ Length \times 10}{Average\ Sentence\ Length} \quad (5)$$

Based on the above formula, the Bog index measures the lack of readability rather than its readability. Thus, we integrate alternative measures to the Bog index into our model to have a clear interpretation of the association between the readability of the firm's narrative disclosures and its debt choices. More specifically, we propose the following two measures of readability. We obtain the first measure by multiplying the Bog index by (-1). The second one considers the range standardization of the reciprocal of the Bog Index. These two changes lead to a measure that reflects the readability rather than the lack of readability.

While early studies that tackled the readability of financial disclosures have massively opted for the Gunning Fog Index as the primary measure (Biddle, Hilary, and Verdi 2009; Lawrence 2013; Leheavy, Li, and Merkley 2011; F. Li 2008), Loughran and McDonald (2014) have seriously investigated its relevance with regard to the complexity of words and their relative measures based on the number of syllables¹³. However, such a measure would probably mislead the assessment of the readability of firm disclosures. For example, terms such as *corporation*, *investment*, and *management*, considered complex under the Fog Index, are commonly used in firms' disclosures and quite familiar to the average investor. In this respect, Bonsall et al. (2017) point out that the most significant contribution of the Bog Index compared to

¹³ The formula for Gunning Fog index is $0.4 \times \left[\left(\frac{Total\ words}{Total\ sentences} \right) + 100 \left(\frac{Complex\ words}{Total\ words} \right) \right]$. Complex words are those containing three or more syllables.

other traditional measures of readability lies in its second component, Word Bog. Indeed, the Bog Index share more common criteria with those defined by the SEC to measure readability than its predecessors¹⁴.

3.3. Control variables

Based on prior research, we control for a wide range of firm characteristics such as firms' debt choices following previous studies (Boubaker, Rouatbi, and Saffar 2017; Boubaker, Saffar, and Sassi 2018; Denis and Mihov 2003; Houston and James 1996; Lin et al. 2013). The inclusion of these control variables aims to assess the incremental effect of readability on debt choices. We also control for the natural logarithm of total assets (*SIZE*). Indeed, large firms are likely to face lower information asymmetries because they benefit from lower information-producing costs and are well prepared than smaller firms (Blackwell and Kidwell 1988; Houston and James 1996). Then, we control for *LEVERAGE*, measured as the ratio of total liabilities to total assets. The expected effect of leverage on debt choices is mixed. Since heavily indebted firms might be considered poor-quality firms, they might exhibit lower demand for bank-monitored debt (Diamond 1991).

On the other hand, leverage may act as a disciplinary device implying more reliance on public debt. We also control for *PROFITABILITY* measured by the firm's return on assets. Denis and Mihov (2003) find that more profitable firms enjoy a better reputation in the credit markets and are more likely to issue public debt. We include the ratio of net property, plant, and equipment to total assets, *TANGIBILITY*. Tangible assets serve as collateral for debt which means a better credit quality. In this respect, Denis and Mihov (2003) provide empirical evidence that firms with more tangible assets are more likely to rely on public debt. Diamond (1991)'s model predicts that successful firms with more investment opportunities rely less on bank-monitored debt. We propose to include *TOBIN's Q* as a proxy for the firm growth opportunities. *TOBIN's Q* is defined as the sum of the market value of equity plus the book value of

¹⁴ In its "A Plain English Handbook", the SEC identifies 9 common mistakes likely to degrade the readability of firm's disclosures, namely Long sentences, Passive voice, Weak verbs, Superfluous words, Legal and financial jargon, Numerous defined terms, Abstract words, Unnecessary details, and Unreadable design and layout.

debt divided by total assets. Finally, we control for *ALTMAN Z-score* as a measure for the firm's likelihood of bankruptcy. Prior literature reports mixed results regarding the impact of the firm's z-score on debt choices.

On the one hand, Denis and Mihov (2003) find that firms with a higher probability of bankruptcy are likely to have a higher ratio of bank debt leading to more banks' scrutiny. On the other hand, other studies argue that these firms are more inclined to substitute banks' loans with public debt to avoid banks' strict monitoring (Roberts and Sufi 2009; Sufi 2009). Variable definitions are provided in the appendix.

3.4. Data and summary statistics

Our sample runs over the period 2001 through 2018. We started in 2001 since it is the year of the start of data availability on debt structure. We collect control variables from Compustat. In line with previous studies, we exclude firms belonging to the financial and utility sectors. Similarly, to mitigate the influence of outliers, we winsorize all continuous variables at the 1% and 99% levels. We also exclude observations with missing data on debt structure, readability, or control variables. Finally, we exclude firms with singleton observations to avoid overestimating the statistical significance (Correia 2015). The final sample consists of 16532 firm-year observations representing 2337 unique firms.

Table 1 presents descriptive statistics of the key variables in our regression models. Notably, we find that firms tend to rely on public debt more than banks' loans. Indeed, the public debt represents 50.14% of the firm's total debt against only 39.37% of banks' loans. Further, the average readability score is less than -85, i.e., a Bog index of +85, in the same range as previous studies (Bonsall and Miller 2017; Hasan 2020; Rjiba et al. 2021). According to Stylewriter, the Bog index for government and business disclosures is generally between 60 and 100, placing the average readability of our sample in line with the values announced by Stylewriter. To put this in perspective, the Bog Index can vary from zero to over one thousand, and interpretations of readability are as follows: 0 to 20 = Excellent; 21 to 40 = Good; 41 to 70 = Average; 71 to 100 = Poor; 101 to 130 = Bad; 131 to 1000 = Dreadful; and 100+ = Gobbledygook.

Table IV. 1. Descriptive statistics

This table reports the descriptive statistics for the variables used in our main tests. The final sample comprises 16,532 firm-year observations representing 2,337 unique firms over the 2001 to 2018 period, with non-missing values for all control variables, for our analyses of the impact of 10-K reports readability on the firm's debt choice. All variables are defined in Appendix A

	N	Mean	Std. Dev.	min	max	p5	p25	p50	p75	p95
Dependent Variables										
bankratio	16,532	39.37	44.3	0	100	0	0	11.01	100	100
publicratio	16,532	50.14	44.77	0	100	0	0	59.64	98.97	100
Test Variables										
readability	16,532	-84.88	6.54	-99	-69	-96	-89	-85	-80	-74
readability_s	16,532	0	1	-2.14	2.96	-1.53	-.71	-.05	.71	1.738
Control Variables										
size	16,532	6.62	2.1	2.43	11.67	3.24	5.05	6.59	8.04	10.285
leverage	16,532	22.17	17.28	.01	78.3	.32	8.36	19.85	31.98	55.8
tangibility	16,532	54.06	41.32	2.69	200.21	7.48	22.31	41.95	77.26	133.376
profitability	16,532	-.67	17.94	-94.24	23.12	-36.99	-1.28	3.98	7.63	14.741
tobin	16,532	1.92	1.17	.60	7.33	.84	1.19	1.57	2.22	4.332
zscore	16,532	.95	3.29	-17.65	4.96	-4.94	.77	1.70	2.47	3.702

Table 2 presents the correlation coefficients between our key variables. Bank debt and public debt are negatively and significantly correlated (correlation of -0.8), which confirms the findings of Rauh and Sufi (2010) of a mutually exclusive choice between public and private debt. Further, the correlation between readability and bank (public) debt is negative (positive) and significant at the 1% threshold, corroborating our earlier assumptions.

Table IV. 2. Pairwise Correlations

This table reports the Pairwise correlations coefficients for the variables used in our main tests. The final sample comprises 16,532 firm-year observations representing 2,337 unique firms over the 2001 to 2018 period, with non-missing values for all control variables, for our analyses of the impact of 10-K reports readability on the firm's debt choice. The superscript asterisk (*) indicates statistical significance at the 1% level. All variables are defined in Appendix A.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) bankratio	1.00								
(2) publicratio	-0.80* (0.00)	1.00							
(3) readability	-0.05* (0.00)	0.04* (0.00)	1.00						
(4) size	-0.38* (0.00)	0.48* (0.00)	-0.04* (0.00)	1.00					
(5) leverage	-0.11* (0.00)	0.27* (0.00)	-0.01 (0.09)	0.23* (0.00)	1.00				
(6) tangibility	0.02 (0.01)	0.02* (0.01)	0.27* (0.00)	0.02 (0.03)	0.17* (0.00)	1.00			
(7) profitability	-0.01 (0.56)	0.06* (0.00)	0.19* (0.00)	0.38* (0.00)	-0.06* (0.00)	0.03* (0.00)	1.00		
(8) tobin	-0.08* (0.00)	0.02 (0.01)	-0.13* (0.00)	-0.06* (0.00)	-0.05* (0.00)	-0.17* (0.00)	-0.12* (0.00)	1.00	
(9) zscore	0.0* (0.000)	0.01 (0.42)	0.24* (0.00)	0.34* (0.00)	-0.08* (0.00)	0.03* (0.00)	0.76* (0.00)	-0.24* (0.00)	1.00

4. Main analysis: Readability-Debt choices Relation

4.1. Model specification

To investigate the effect of readability on the firm's debt choices, we estimate the following model:

$$y_{it} = a_0 + \beta_1 \text{Readability}_{it} + \sum \gamma_k' X_{kit} + \text{Industry dummies} + \text{Year dummies} + \varepsilon_{it} \quad (6)$$

where y_{it} is the ratio of bank debt to total debts. As described earlier, we measure readability using the Bog Index multiplied by -1. Indeed, the higher the Bog index, the less readable the document. Thus, multiplication by -1 allows a positive association between our measure and the readability of firms' 10-K reports. X_{kit} are ($K \times 1$) vectors of firm-level controls at time t . We estimate equation (6) using ordinary least squares (OLS). Following the recommendations of Petersen (2009) for estimating standard errors in panel data with applications to corporate finance, we compute robust standard errors using a double cluster at the firm and year levels. We also include

industry and year fixed effects to control for industry or time-specific shocks to firms' debt choices.

4.2. Results

Table 3 portrays the regression results for the relationship between the readability of the narrative disclosures in 10-K reports and the firm's debt choices. We use $(-1) \times \text{Bog Index}$ as the leading explanatory variable through columns (1) to (4), and the range standardization of the reciprocal of the Bog index for columns (5) to (8). The coefficient of readability is found to be negative and significant at the 1% significance level, implying that the less readable the firm's 10-K report, the more the reliance on the bank debt. The coefficient remains negative and statistically significant after including the industry and yearly fixed effects separately then jointly. The relationship between the readability of the firm's narrative disclosures and the proportion of bank debt is economically meaningful. For instance, results reported in column (4) show that a one standard deviation increase in readability is associated with a 4.35 percent, i.e., $(6.539 \times 0.262 / 0.394)$, decrease in bank debt ratio relative to the mean.

As for the control variables, the coefficient estimates are globally consistent with the finding of prior studies. For instance, smaller firms with lower market-to-book ratios are likely to rely on bank debts (Boubaker, Saffar, and Sassi 2018; Denis and Mihov 2003; Hadlock and James 2002; Nakamura 1991) more. Regression results also document a positive association between the firm's profitability and the ratio of bank debt to total debt (Hoshi, Kashyap, and Scharfstein 1993). They also show that firms with a higher z-score, i.e., higher probability of bankruptcy, are more likely to substitute public debts with bank debts (Denis and Mihov 2003).

Table IV. 2. The impact of readability on debt choice

This table presents the regression results for the impact of 10-K reports readability on firm's debt choice. The dependent variable is the proportion of bank debt to total debt. For reasons of space, the results for the firm's public debt are reported in the Appendix. We use *readability* for the columns (1) through (4) and *readability_s* for the columns (5) through (8), as the firm's readability measures. Year fixed effects and Industry fixed effects are first added separately, then jointly, to the regression in columns (2), (3), and (4), respectively. Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	<i>readability</i>				<i>readability_s</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Readability measure	-.14*** (2.716)	-.154*** (2.777)	-.232*** (-4.594)	-.262*** (-4.868)	-.026*** (3.269)	-.029*** (3.395)	-.034*** (-4.333)	-.038*** (-4.53)
size	-9.99*** (-68.716)	-9.969*** (-64.093)	-9.201*** (-62.4)	-9.182*** (-58.153)	-.481*** (-68.575)	-.48*** (-63.921)	-.444*** (-62.313)	-.443*** (-58.03)
leverage	-.003 (-.133)	-.029 (-1.473)	-.004 (-.181)	-.025 (-1.27)	-.001 (-.152)	-.011 (-1.479)	-.001 (-.168)	-.01 (-1.263)
tangibility	.004 (.515)	-.001 (-.128)	.014* (1.756)	.008 (.706)	.003 (.37)	-.002 (-.189)	.013* (1.678)	.006 (.648)
profitability	.092*** (3.267)	.082*** (2.901)	.105*** (3.669)	.095*** (3.279)	.041*** (3.288)	.037*** (2.917)	.047*** (3.673)	.043*** (3.287)
tobin	-2.359*** (-8.463)	-2.201*** (-7.551)	-2.439*** (-8.651)	-2.228*** (-7.566)	-.067*** (-8.491)	-.063*** (-7.582)	-.069*** (-8.592)	-.063*** (-7.534)
zscore	2.087*** (13.404)	2.083*** (12.97)	1.975*** (12.445)	1.93*** (11.78)	.167*** (13.312)	.167*** (12.893)	.158*** (12.345)	.154*** (11.679)
_cons	82.528*** (18.467)	80.287*** (16.835)	119.674*** (26.044)	121.308*** (24.502)	0 (0)	0 (0)	0 (0)	0 (0)
Observations	16134	16134	16134	16134	16134	16134	16134	16134
Adj R ²	.172	.183	.209	.22	.172	.183	.209	.22
Year FE	No	No	Yes	Yes	No	No	Yes	Yes
Industry FE	No	Yes	No	Yes	No	Yes	No	Yes

4.3. Robustness checks

4.3.1. *Alternative measures of readability*

As some researchers cast doubt about Bog index measure used to gauge the degree of readability of financial reports, we propose three alternative measures. The first is the firm's 10-K file size (Ertugrul et al., 2017; Loughran and McDonald, 2014). Loughran and McDonald (2014) have empirically demonstrated that the size of the s is a robust measure of readability and subject to fewer measurement errors since it requires less strenuous text parsing.

The second alternative measure is the length of the 10-K report. In adverse information, managers are more likely to bury them in long documents that make their detection more challenging for external stakeholders. In this way, practitioners associate lengthy disclosures with lower readability (Barker 2002), and the SEC continues to encourage firms to produce as short and succinct disclosures as possible (Handbook 1998). Thus, we measure the length of the text as the natural logarithm of the number of words in the document (F. Li 2008).

Finally, we consider the lexical variation the third alternative measure of readability (Vajjala and Meurers 2012). It is equal to the natural logarithm of the number of unique words in a firm's narrative disclosure. We expect that the higher the lexical variation, the less readable the text becomes. Nonetheless, it is worth noting that these three alternative proxies measure the lack of readability of textual disclosures. Thus, as we did for the Bog index, we propose multiplying each by (-1), so analyzing the relationship between the readability and the debt choices topics becomes more straightforward and meaningful.

The results, tabulated in table 4, show that the estimated coefficient of each of the three alternative measures of readability continues to load negatively and significantly at the 1% level for the file size and the lexical variation, and at 5% for the text length, lending support to our main findings.

Table IV. 3. Alternative readability measures

This table presents the regression results for the impact of 10-K reports readability on firm's debt choice using three alternative measures of readability. More specifically, we use *file size*, *length*, and *lexical_var* as alternative measures through columns (1) to (3), respectively. The dependent variable is the proportion of bank debt to total debt. For reasons of space, the results for the firm's public debt are reported in the Appendix. Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	(1) File_Size	(2) Length	(3) Lexical_var
file_size	-5.06*** (-19.788)		
length		-1.86** (-2.502)	
lexical_var			-6.481*** (-3.799)
size	-11.259*** (-64.125)	-9.957*** (-53.904)	-10.057*** (-55.242)
leverage	-.021 (-1)	-.02 (-.927)	-.019 (-.892)
tangibility	-.004 (-.351)	-.003 (-.281)	-.002 (-.183)
profitability	.103*** (3.193)	.107*** (3.262)	.108*** (3.31)
tobin	-2.542*** (-7.675)	-2.4*** (-7.13)	-2.415*** (-7.188)
zscore	2.454*** (13.591)	2.236*** (12.139)	2.267*** (12.302)
_cons	41.114*** (10.947)	88.485*** (11.656)	57.139*** (4.309)
Observations	14318	14318	14318
Adj R ²	.218	.198	.199
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

4.3.2. Alternative regression models

We restart the regression by replacing the contemporaneous measure of readability with its delayed one. We opt for this specification because a firm's debt choices can hardly influence past narrative disclosures' readability. This partially helps mitigate the reverse causality concern. The results are portrayed in column (1) of table (5). After that, we include firm fixed effects in our regression in column (2). This approach should alleviate concerns that our results are biased by omitted or unknown characteristics of the firm. We also use weighted least squares regression, generalized equation estimation (GEE), and Tobit regression, respectively, in columns (3) to (5).

Once again, all the estimates in table (5) show a negative and significant association between the 10-K readability reports and the firm's reliance on bank debt, confirming our main findings reported in table (3).

Table IV. 4. Alternative estimates methods

This table presents the regression results for the impact of 10-K report readability on firm's debt choice. The dependent variable is the proportion of bank debt to total debt. For reasons of space, the results for the firm's public debt are reported in the Appendix. We use *readability*, as the firm's readability measure. The lagged readability is used as the measure of the firm's readability in column (1). Firm fixed effects are added in column (2). Weighted least squares, generalized estimation equation, and Tobit regressions' results are reported in columns (3) to (5), respectively. Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	(1) lagged	(2) FFE	(3) WLS	(4) GEE	(5) Tobit
readability	-.236*** (-3.981)	-.16** (-2.054)	-.352*** (-18.904)	-.354*** (-5.318)	-.629*** (-3.765)
size	-9.821*** (-58.811)	2.468*** (3.487)	-6.021*** (-62.313)	-5.293*** (-16.05)	-3.705*** (-3.226)
leverage	-.079*** (-3.617)	-.048* (-1.811)	.004 (.642)	-.02 (-.908)	-.076 (-1.347)
tangibility	-.005 (-.463)	.006 (.285)	-.044*** (-10.222)	-.015 (-1.065)	-.01 (-.265)
profitability	.136*** (4.148)	.014 (.51)	-.008 (-.941)	.006 (.224)	-.024 (-.34)
tobin	-2.324*** (-7.138)	-.086 (-.251)	-1.245*** (-13.531)	-1.37*** (-4.653)	-2.811*** (-3.335)
zscore	1.869*** (9.914)	-.681** (-2.358)	1.035*** (15.965)	1.069*** (5.733)	.887 (1.526)
_cons	89.198*** (17.109)	11.255 (1.591)	53.624*** (22.802)	47.029*** (6.153)	-6.233 (-.227)
Observations	13852	16126	16134	16134	16134
Adj R ²	.21	.65	.z	.z	.z
Industry FE	Yes	No	Yes	Yes	Yes
Firm FE	No	Yes	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes

4.3.3. Endogeneity treatment: difference-in-difference regression

To alleviate the concerns of endogeneity problems, we re-estimate the model using the difference-in-difference (DID) regression. For this, we follow Hwang and Kim (2017) to consider the Plain Writing Act (PWA), ratified by President Barack Obama in October 2010, as an exogenous shock to readability. The PWA applies to federal executive agencies and aims to promote plain English in drafting any documents disclosed by these agencies to improve readability. As Hwang and Kim (2017) explain, although the PWA is not business-oriented, it is highly likely to have an incremental influence on the firm's disclosures because of the inevitable

intersections between firms and federal agencies. Nevertheless, It would be fair to note that the plain English mandate imposed by the SEC on firms in October 1998 represents a more direct exogenous shock to the readability of disclosures (Bonsall and Miller 2017). Unfortunately, it is impractical to use this latter metric because the data on the debt structure is only available from 2001.

Our intuition is that firms displaying lower readability before exogenous shock will be most influenced, while firms whose disclosures were already highly readable before the PWA entry in force, would be only modestly affected. Thus, we use lower readability firms as the treatment group and higher readability ones as the control group. We expect the readability of the "treatment" group to improve significantly due to the shock. A direct consequence of this improvement should be a reduction in information asymmetries, resulting in a less pronounced negative association between the level of readability and the use of bank debt. We propose to run the following regression equation:

$$y_{it} = a_0 + \beta_1 Treated * Post_i + \beta_2 Treated_i + \beta_3 Post_i + \sum \gamma_k' X_{kit} + Industry\ dummies + \varepsilon_{it} \quad (7)$$

where y_{it} is the readability score of the firm as a first step, then the ratio of bank debt to total debts. A firm falls into the treatment (control) group if its readability score before the PWA ratification is in its distribution's bottom (top) quartile. Accordingly, we create a binary variable *Treated*, equal to one for treated firms and zero otherwise. If an observation is within the post-PWA period, we set *Post* to one. For the pre-PWA period, we set it at zero. The pre-PWA period covers the years 2008 and 2009, while the post-PWA period covers 2011 and 2012. We chose to exclude 2010 because, as explained earlier, the PWA constitutes an indirect shock to the readability of firms' disclosures. Therefore, we believe that there should be a response time for firms to take the new deal into account and adapt to it. Finally, we create an interaction variable, *Treated*Post*, with the two abovementioned binary variables to measure the average treatment of enhanced readability.

First, we check the relevance of our first assumption that the quasi-experiment PWA would impact the firms of the treatment group, i.e., the firms with lower

readability, more than their higher readability counterparts. Then, we regress the readability score on the three variables previously defined, i.e., *Treated*, *Post*, and *Treated*Post*, and account for the control variables. Column (1) of Table (6) reports the results. The estimated coefficient of the treatment group is significantly and intuitively negative (-14.713). More importantly, the estimate of the interaction variable is significantly positive (+0.39), indicating that the exogenous shock generated by the PWA allowed a reduction in the gap between the firms with lower and higher readability, respectively.

We then examine the impact of this exogenous readability shock on the debt choices. We replicate the regression for equation (7) using the bank debt to total debt ratio as a dependent variable. In addition, we are interested in estimating the coefficient of the interaction variable. Column (2) of Table (6) shows a clear and significant increase (+8.143) compared to the pre-PWA period. This increase may alternatively be viewed as a less glaring negative relationship between the readability of firms' disclosures and the ratio of bank debt to total debts. In other terms, the advent of the PWA, a significant exogenous shock to readability, was associated with a less pronounced reliance on bank financing debt. The results of the DID regression lend more credit to our primary assumption that enhanced readability would likely alleviate information asymmetries' concerns, and therefore reduce the use of bank debt.

We further advanced our analysis by introducing the placebo test to check whether firms had experienced such a sudden variation in the relationship between their readability score and their ratio of bank debt to total debts outside the PWA window. For this purpose, we resume the DID analysis for the years preceding 2010 to avoid any overlap with the PWA event. Since we need a window of two years before each placebo event and two more years after, we apply the placebo for 2003-2007. In contrast with the results for the PWA, we found no evidence of any quasi-experiment effect on the readability of firms' disclosures. Indeed, the estimates of the interaction term, reported through columns (3) to (7), are neither statistically significant nor economically meaningful.

Table IV. 5. Endogeneity Treatment: Quasi-natural experiment

This table presents the regression results for the impact of 10-K report readability on firm's debt choice. The dependent variable is the readability score, in column (1), and the proportion of bank debt to total debt in column (2). For reasons of space, the results for the firm's public debt are reported in the Appendix. We use *readability* as the firm's readability measure. The Plain Writing Act (PWA), ratified in October 2010, is used as the exogenous shock to readability. A firm falls into the treatment (control) group if its readability score before the PWA ratification is in the bottom (top) quartile of its distribution. Accordingly, we create a binary variable *Treated*, that is equal to one for treated firms and zero otherwise. If an observation is within the post-PWA period, we set *Post* to one. For the pre-PWA period, we set it at zero. Finally, we create an interaction variable, *Treated*Post*, with the two abovementioned binary variables to measure the average treatment of enhanced readability. We repeat the exercise around 5 placebo events (before October 2010). The results for the placebo test are reported in columns (3) to (7). Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	Dependent variable		Placebo events				
	(1) readability	(2) Bank debt	(3) 2003	(4) 2004	(5) 2005	(6) 2006	(7) 2007
Treated*Post	.39 (1.514)	8.143** (2.191)	1.41 (.415)	-1.831 (-.554)	-2.791 (-.831)	-1.104 (-.326)	-.861 (-.244)
Treated	-14.713*** (-69.57)	-5.904* (-1.879)	-5.362* (-1.907)	-1.172 (-.444)	-1.878 (-.701)	-5.593** (-2.065)	-4.077 (-1.439)
Post	-.407** (-2.441)	.403 (.157)	1.701 (.903)	4.899** (2.473)	10.457*** (5.158)	11.931*** (5.48)	9.865*** (4.112)
size	-.042 (-1.081)	-10.806*** (-23.454)	-8.16*** (-21.779)	-8.764*** (-22.844)	-9.242*** (-22.697)	-8.634*** (-19.972)	-9.071*** (-19.665)
leverage	-.004 (-.957)	.023 (.37)	-.099** (-2.151)	-.124*** (-2.697)	-.184*** (-3.641)	-.134*** (-2.59)	-.086 (-1.644)
tangibility	.002 (.989)	-.008 (-.232)	.052** (2.032)	.016 (.604)	.029 (1.049)	.01 (.322)	.009 (.271)
profitability	.001 (.239)	-.05 (-.662)	.144* (1.955)	.153** (2.06)	.024 (.283)	-.191*** (-2.629)	-.038 (-.547)
tobin	-.022 (-.309)	-1.272 (-1.315)	-1.713** (-2.331)	-1.754** (-2.298)	-2.1*** (-2.712)	-1.441* (-1.787)	-1.422 (-1.574)
zscore	.073** (2.352)	1.948*** (4.393)	1.831*** (4.257)	2.012*** (4.798)	2.035*** (4.32)	2.76*** (6.572)	2.207*** (5.48)
_cons	-78.362*** (-232.811)	117.328*** (24.697)	84.741*** (21.903)	90.906*** (23.363)	95.56*** (22.799)	91.735*** (21.098)	97.008*** (21.233)
Observations	1862	1862	2583	2578	2388	2256	2138
Adj R ²	.891	.237	.169	.18	.194	.192	.189
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

4.3.4. *Additional control variables*

Nonetheless, the above analyses suggest that companies with lower narrative disclosures readability are more likely to switch from public to private financing. Therefore, we add three more control variables to our baseline model in this section to avoid any distortion to our results. In particular, we extend prior work by using Hoberg, Phillips, and Prabhala (2014) *fluidity* variable, a textual measure of product market competition. Increased *fluidity* equates to an increase in the level of competition. According to Boubaker, Saffar, and Sassi (2018), *fluidity* is likely to act as a substitute monitoring mechanism at the bank, influencing the firm's debt choices.

Consequently, they documented a significant negative association between a firm's use of bank loans and its fluidity. Our second variable is *institutional ownership*. As with fluidity, *institutional ownership* should enhance monitoring quality, hence reducing the requirement for bank funding. Boubaker, Saffar, and Sassi (2018) found that bank debt reduces sharply with the presence of institutional investors. The audit quality will be the third variable to include in our regression. As Chen, Saffar, and Srinidhi (2018) state, enhanced audit quality results in lower information asymmetries, and thus less dependence on bank loans. In order to gauge the audit's quality, we propose to use a binary variable, *big_auditor*, which takes the value of one when the company is audited by one of the Big 4 and zero otherwise.

First, we sequentially integrate these additional controls and then add them all. Table 7 summarizes the findings, showing once again that the readability of a company's narrative disclosures remains negatively and significantly correlated with bank debt.

Table IV. 6. Additional control variables

This table presents the regression results for the impact of 10-K report readability on firm's debt choice. The dependent variable is the proportion of bank debt to total debt. For reasons of space, the results for the firm's public debt are reported in the Appendix. We use *readability*, as the firm's readability measure. We include three additional control variables (i) fluidity, a proxy for product market competition, (ii) institutional, the percentage of firm's shares held by institutions, and *Big_auditor* a binary variable that takes the value of one when the company is audited by one of the Big 4 audit companies and zero otherwise. Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	(1)	(2)	(3)	(4)
<i>readability</i>	-.386*** (-6.608)	-.175** (-2.376)	-.166** (-2.278)	-.243*** (-3.148)
size	-9.226*** (-56.825)	-9.282*** (-41.224)	-9.419*** (-45.585)	-9.282*** (-40.652)
leverage	-.021 (-1.064)	-.065** (-2.424)	-.066** (-2.468)	-.058** (-2.128)
tangibility	-.008 (-.7)	.01 (.696)	.012 (.837)	.007 (.478)
profitability	.084*** (2.87)	.029 (.617)	.028 (.602)	.024 (.504)
tobin	-2.232*** (-7.466)	-2.462*** (-5.815)	-2.505*** (-5.928)	-2.444*** (-5.752)
zscore	1.868*** (11.296)	2.792*** (9.142)	2.775*** (9.119)	2.603*** (8.436)
<i>Fluidity</i>	-1.084*** (-8.747)			-.806*** (-4.751)
<i>Institutional</i>		-1.867 (-1.002)		-1.162 (-.614)
<i>Big_auditor</i>			.083 (.1)	.211 (.251)
_cons	77.682*** (15.557)	86.456*** (13.226)	86.876*** (13.229)	85.461*** (12.775)
Observations	15869	9551	9551	9414
Adj R ²	.183	.197	.197	.199
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

4.3.5. Cross-sectional heterogeneity: the role of information asymmetries

While developing our hypothesis, we assumed that a firm's narrative disclosures readability impacts debt decisions via an informational channel. Our main argument is that enhanced readability decreases information asymmetries, allowing companies to shift from bank loans to public debt. If this information asymmetry-based reasoning is correct, the negative relationship between narrative disclosures readability and bank debt is expected to be stronger in the context of increased information asymmetries.

For instance, prior studies document that analysts' coverage is likely to reduce information asymmetries and provide relevant investment information (Stickel, 1995; Womack 1996; Barber et al. 2010; Jegadeesh et al., 2004), collect and distribute private information thanks to their privileged access to firms' management (Green, Jame, Markov, and Subasi, 2014), reduce equity misevaluation (Keming Li, 2020), and serve as external monitors that reduce firms' earnings management practices (Fang Yu, 2008). Lower analyst coverage is associated with higher information asymmetry. Hence, we expect narrative disclosure readability to impact the debt choices for firms covered by fewer analysts.

Prior research has shown that analysts' coverage reduces information asymmetries by (i) providing investment-relevant information (Barber, Lehavy, and Trueman 2010; Jegadeesh et al. 2004; Stickel 1995; Womack 1996), (ii) collecting and disseminating private information thanks to their privileged access to management (Green et al. 2014), (iii) reducing equity under or overvaluation (K. Li 2020), and (iv) serving as external monitors to firms, discouraging managers from engaging in earnings management practices (Yu 2008). Thus, higher information asymmetry is linked to lower analyst coverage. As a result, we predict narrative disclosure readability to have a more significant impact on debt choices for firms with fewer analysts covering them.

We also suggest the probability of informed trade (PIN), which has been widely utilized in the literature to measure information asymmetry (Easley and O'hara 2004; Easley, Hvidkjaer, and O'hara 2002; Odders-White and Ready 2008; Vega 2006). Higher PIN is linked to more unfavorable selection and, as a result, more information asymmetry. The impact of readability on a company's debt choices is thus projected to be more significant for companies with higher PIN scores.

Then, as a moderator variable, we employ credit rating. According to previous studies, credit rating agencies provide a refined assessment of a company's creditworthiness. These agencies will drastically assist in minimizing information asymmetries on credit markets by communicating their opinions with market participants (Becker and Milbourn 2011; Kisgen 2006; Tang 2009). We distinguish between two types of credit ratings: long-term debt and investment grade. Credit

ratings are announced based on short or long-term maturity. We consider the latter because it gives forward-looking assessments of a firm's credit quality independent of business cycle effects. We also look at whether the company is rated as investment grade. A corporate debt with a credit rating of BBB- or higher is considered an investment grade which implies a lower risk of default. In the light of the above, it is evident that the credit rating significantly contributes to reducing information asymmetry. Consequently, we predict the negative relationship between readability and reliance on bank loans to be more pronounced for enterprises without ratings.

The past literature also establishes the institutional ownership's monitoring effect. Indeed, as the share of equity held by institutions increases, managers are less likely to engage in any fraudulent actions (Callen and Fang 2013; Glaum, Landsman, and Wyrwa 2018; Ward, Yin, and Zeng 2018). In other words, enhanced institutional monitoring will reduce moral hazard, i.e., lower ex-post information asymmetries. As a result, we expect the negative relationship between a company's readability and its reliance on bank debt to be less prominent for companies with more institutional ownership.

Market competition pressure is another proxy for external monitoring, and hence the degree of ex-post information asymmetries. Increased pressure will act as a backup mechanism for ensuring more effective monitoring (Boubaker, Saffar, and Sassi 2018; Hart 1983; Shleifer and Vishny 1997; Tian and Twite 2011). In other words, decreased competitive pressure is likely to be coupled with an increase in information asymmetries, exacerbating the information channel through which readability influences the firm's debt selection. As a result, we argue that the negative correlation between readability and reliance on bank debt should be more robust for enterprises operating in less competitive environments.

We perform our baseline regression using each one of the above moderating variables. More specifically, we generate a dummy variable *HIGH* (*LOW*) that takes the value of one whenever the variable is above (below) the median of the distribution and a value of zero otherwise. Then we run the regression using the interaction terms between the firm's readability and the dummy variable. Table 8 summarizes the findings of the analysis. For example, the variable *READ*HIGH* in column (1) reports

the readability score of firms with higher analysts' coverage. Results reported through columns (1) to (6) demonstrate how information asymmetries are likely to condition the relationship between firms' readability and the use of bank loans. Our primary variable of interest is the interaction between the firm's disclosures readability and each information asymmetries proxies. Across all specifications, the negative association between the readability of firms' narrative disclosures and the reliance on bank loans continues to hold more substantially for subsamples with higher information asymmetries, i.e., firms with lower analysts' coverage, higher PIN scores, no credit ratings, lower institutional ownership, and lower market competitive pressure. Moreover, the difference between *READ*HIGH* and *READ*LOW* estimates is significantly different from zero at the 1% level through all columns. These findings corroborate our central hypothesis.

Table IV. 7. Cross-sectional heterogeneity: The role of information asymmetry

This table presents the regression results for the impact of 10-K report readability on firm's debt choice. The dependent variable is the proportion of bank debt to total debt. For reasons of space, the results for the firm's public debt are reported in the Appendix. We use *readability*, as the firm's readability measure. We consider the number of analysts following a firm., and the probability of informed trade (*PIN*) in columns 1 and 2, respectively. *Dltdrt*, a dummy variable that takes one if the firm has an S&P long-term debt rating, and *dinvdrt*, a dummy variable that takes one if the firm has an investment grade S&P long-term rating, are in columns (3) and (4). Finally, we consider Institutional, the percentage of firm's shares held by institutions, and fluidity, a proxy for product market competition, in columns (5) and (6), respectively. For each one of these moderating variables, we generate a dummy variable *HIGH (LOW)* that takes the value of one whenever the variable is above (below) the median of the distribution and a value of zero otherwise. *READ*HIGH (READ*LOW)* is the interaction term between the firm's readability score and the dummy variable *HIGH (LOW)*. Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	(1) Analysts	(2) PIN	(3) dltdrt	(4) dinvdrt	(5) Institutional	(6) fluidity
READ*HIGH	-.042 (-.632)	-.052*** (-3.232)	.081 (1.332)	.09 (1.462)	-.122* (-1.894)	-.272*** (-4.593)
READ*LOW	-.098 (-1.437)	.075*** (5.488)	-.189*** (-3.141)	-.113* (-1.868)	-.154** (-2.352)	-.342*** (-5.637)
size	-9.161*** (-34.523)	-7.218*** (-22.901)	-5.476*** (-21.373)	-6.746*** (-27.841)	-9.127*** (-43.643)	-9.239*** (-56.666)
leverage	-.095*** (-3.888)	-.13*** (-4.921)	.039* (1.708)	-.101*** (-4.558)	-.06** (-2.22)	-.027 (-1.341)
tangibility	.013 (.993)	.026* (1.81)	.016 (1.346)	.014 (1.21)	.006 (.407)	-.007 (-.649)
profitability	.099*** (2.631)	.052 (1.409)	.066** (2.087)	.069** (2.168)	.033 (.696)	.097*** (3.332)
tobin	-2.815*** (-7.554)	-2.048*** (-4.754)	-2.682*** (-8.027)	-2.187*** (-6.523)	-2.458*** (-5.82)	-2.275*** (-7.602)
zscore	1.92*** (8.577)	2.442*** (11.43)	1.918*** (10.55)	2.007*** (10.954)	2.781*** (9.126)	1.87*** (11.297)
_cons	97.427*** (15.413)	84.887*** (32.278)	67.835*** (12.493)	79.78*** (14.879)	87.555*** (14.781)	77.909*** (14.969)
Observations	11154	8890	13428	13428	9551	15869
Adj R ²	.186	.179	.21	.197	.198	.182
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

4.3.6. *Cross-sectional heterogeneity: the role of financing constraints*

We then investigate how financing constraints possibly influence the relationship between the firm's narrative disclosure readability and its debt choices. Prior research indicates that firms' financing constraints significantly shape their debt choices (Denis and Mihov 2003; Fazzari, Hubbard, and Petersen 1988; Stiglitz and Weiss 1981). Firms with financing constraints are less appealing to bond investors because of poor financial conditions. As a result, firms that face more significant financing constraints are more likely to rely on bank loans. Nonetheless, by contributing to the reduction of information asymmetries, higher readability should alleviate these constraints and provide better access to the public debt market. As a result, we anticipate that the negative relationship between readability and bank debt will be stronger for firms with more significant financing constraints.

In order to evaluate the hypothesis above, we employ four proxies for financing constraints. In addition to the firm size (*size*), there are the H.P. index (H.P.), K.Z. index (K.Z.), and the W.W. index (W.W.). Indeed, earlier research has suggested that large corporations have easy access to external financing (Farre-Mensa and Ljungqvist 2016; Faulkender and Petersen 2006). The H.P. (Hadlock and Pierce 2010), K.Z. (Kaplan and Zingales 1997), as well as the W.W. index (Whited and Wu 2006) measures of financial constraints are also extensively acknowledged in the literature. The relationship is more significant with financial constraints when the firm's size is smaller and H.P., K.Z., and W.W. are higher.

Based on the previous discussion, we divide our sample based on the median values of various financial restrictions proxies. If a variable is above (below) the median of its distribution, the dummy variable *HIGH* (*LOW*) takes the value one and otherwise zero. We then run the regression of our baseline model. Our main variables of interest are the interactions between the readability score *READ* and dummy variables *HIGH* and *LOW*, respectively. Table 9 summarizes the results of the subsample study for companies with high and low financial constraints through columns (1) to (4). Conforming to the arguments stated previously, we find that *readability* is negatively associated and statistically significant for the subsample of companies that have more binding financial constraints, i.e., firms with smaller size,

higher H.P., K.Z., and W.W. index scores. Additionally, the only exception being the W.W. index, the difference between *READ*HIGH* and *READ*LOW* estimations is statistically different from zero across all columns at the 1% level. These findings suggest that financing constraints magnify the inverse relationship between a firm's disclosures readability and its proportion of bank debt.

Table IV. 8. Cross-sectional heterogeneity: The role of financial constraints

This table presents the regression results for the impact of 10-K report readability on firm's debt choice. The dependent variable is the proportion of bank debt to total debt. For reasons of space, the results for the firm's public debt are reported in the Appendix. We use *readability*, as the firm's readability measure. *Size* is the firm's size. *HP* is the Hadlock and Pierce (2010) financial constraint index. *KZ* is the Kaplan and Zingales (1997) financial constraint index. *WW* is the Whited and Wu (2006) financial constraint index. For each one of these moderating variables, we generate a dummy variable *HIGH (LOW)* that takes the value of one whenever the variable is above (below) the median of the distribution and a value of zero otherwise. *READ*HIGH (READ*LOW)* is the interaction term between the firm's readability score and the dummy variable *HIGH (LOW)*. Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

	(1) <i>Size</i>	(2) <i>HP</i>	(3) <i>KZ</i>	(4) <i>WW</i>
<i>READ_HIGH</i>	-.223*** (-3.992)	-.218*** (-3.591)	-.202*** (-3.343)	-.194*** (-3.196)
<i>READ_LOW</i>	-.319*** (-5.678)	-.159*** (-2.633)	-.145** (-2.377)	-.175*** (-2.868)
size	-7.746*** (-30.169)	-8.232*** (-30.524)	-9.034*** (-51.958)	-8.884*** (-34.854)
leverage	-.015 (-.724)	-.056** (-2.567)	-.143*** (-5.724)	-.069*** (-3.176)
tangibility	-.003 (-.28)	.009 (.785)	.01 (.838)	.008 (.675)
profitability	.11*** (3.807)	.093*** (2.97)	.104*** (3.312)	.091*** (2.883)
tobin	-2.291*** (-7.727)	-2.428*** (-7.515)	-2.707*** (-8.38)	-2.446*** (-7.528)
zscore	1.855*** (11.324)	2.035*** (11.463)	2.016*** (11.139)	2.027*** (11.195)
_cons	70.669*** (13.868)	79.702*** (14.456)	88.296*** (16.573)	84.553*** (15.52)
Observations	16134	14062	13926	13926
Adj R ²	.184	.181	.182	.18
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

5. Conclusion

We examine the association between the readability of firms' narrative disclosures and debt choices. We expect enhanced readability will help alleviate concerns about information asymmetries implying firms to substitute less information-sensitive debt instruments, i.e., banks' loans, with more information-

sensitive ones, i.e., public debt. Using a sample of 16,532 firm-year observations spanning over 2001-2018, we document a negative and significant association between the readability of a firm's narrative disclosures and its reliance on bank loans. Our findings remain robust after controlling for alternative readability metrics, additional control variables, and alternative regression specifications. Additionally, we demonstrate that endogeneity concerns shall not compromise the validity of our inferences. Moreover, cross-sectional analysis reveals a more pronounced negative correlation between readability and the proportion of bank debt to total debt for informationally opaque and financially restricted firms.

Our work contributes to the literature on the readability of firms' financial disclosures and debt choices. Indeed, previous research indicates that readability is likely to impact a firm's debt structure. For example, Ertugrul et al. (2017) document that firms with low readability in the annual reports face stricter terms upon bank loan contracts. In contrast, Bonsall and Miller (2017) find that lower readability is associated with a lower firm's rating, a more significant variation in the bond ratings provided by different rating agencies, and a higher cost of debt.

Our analysis demonstrates that firms with higher readability are more likely to switch from private to public debt, implying that readability is more valuable when issuing bonds than borrowing from banks. Our work adds to the body of research on firms' debt choices. Finally, we demonstrate that enhanced disclosure readability enables firms to gain access to public debt.

Appendices

Appendix IV.A. 1. Variables

Appendix A

Variable	Definition	Source
Dependent variables		
<i>Bank debt</i>	Bank debt over total debt. Bank debt is defined as the sum of term loans and revolving credit, and total debt is defined as the sum of all types of debt, including commercial paper, revolving credit, term loans, subordinated bonds and notes, senior bonds and notes, capital leases, and other debt.	Capital IQ
<i>Public debt</i>	Public debt over total debt. Public debt is defined as the sum of commercial paper, subordinated bonds and notes, senior bonds and notes. Total debt is defined as the sum of all types of debt, including commercial paper, revolving credit, term loans, subordinated bonds and notes, senior bonds and notes, capital leases, and other debt.	Capital IQ
Explanatory variables		
<i>Readability</i>	A measure for financial statements readability computed as the Bog Index multiplied by (-1). The calculation details of the Bog Index are obtained from Equations (1) – (5).	Brian P. Miller Data Library
<i>Readability_s</i>	A measure for financial statements readability computed as the range standardization of the reciprocal of the Bog Index. The calculation details of the Bog Index are obtained from Equations (1) – (5).	Same as above
Control variables		
<i>Size</i>	Natural logarithm of total assets in US dollars (millions)	Compustat
<i>Leverage</i>	Sum of long-term debt and debt in current liabilities, divided by total assets	Same as above
<i>Tobin's Q</i>	Sum of market value of equity and book value of debt, divided by total assets	Same as above
<i>Profitability</i>	Income before extraordinary items divided by total assets.	Same as above
<i>Tangibility</i>	Total property, plant, and equipment divided by total assets	Same as above
<i>Z-score</i>	Altman's (1968) Z-score, calculated as $(1.2 \times \text{working capital} + 1.4 \times \text{retained earnings} + 3.3 \times \text{earnings before interest and taxes} + 0.999 \times \text{sales}) / \text{total assets} + 0.6 \times (\text{market value of equity} / \text{book value of debt})$.	Same as above
Variables used in robustness tests		
<i>File_size</i>	The natural logarithm of the 10-K annual report's size, multiplied by (-1).	Brian P. Miller Data Library
<i>Length</i>	The natural logarithm of the number of words in the 10-K annual report, multiplied by (-1)	Same as above
<i>Lexical_var</i>	the natural logarithm of the number of unique words in a firm's 10-K annual report, multiplied by (-1).	Same as above
<i>Fluidity</i>	A text measure of product market competition based on the product descriptions found in firms' 10-K filings. The higher the similarity between a firm's own words vector and its rivals' words vector, the higher the competitive pressure.	Hoberg and Phillips Data Library
<i>Institutional</i>	the ownership stake in a company that is held by large financial organizations, pension funds, or endowments	Thomson Reuters

<i>Big_auditor</i>	A binary variable tha takes the value of one when the company is audited by one of the Big 4 and zero otherwise	Compustat
<i>dltdrt</i>	Dummy variable that takes one if the firm has an S&P long-term debt rating.	Capital IQ
<i>dinvdrt</i>	Dummy variable that takes one if the firm has an investment grade S&P long-term rating.	Capital IQ
<i>Analysts</i>	The number of analysts following the firm at year <i>t</i> .	I/B/E/S International
<i>PIN</i>	The probability of informed trading.	Stephen Brown Data Library
<i>HP</i>	The Hadlock and Pierce (2010) index, a measure of firms' financial constraints calculated as follows: $-0.737 \times \text{Assets} + 0.043 \times \text{Assets}^2 - 0.040 \times \text{Age}$.	Authors' calculation based on Compustat data
<i>KZ</i>	The Kaplan-Zingales (1997) index is an indicator of a company's financial constraints. Businesses with a higher KZ-Index score are more likely to face challenges when financial conditions tighten. The KZ index is computed as follows: $-1.001909 \times \text{Cash flows/PPE} + 0.2826389 \times Q + 3.139193 \times \text{Debt/Total capital} + -39.3678 \times \text{Dividends/PPE} + -1.314759 \times \text{Cash/PPE}$	Same as above
<i>WW</i>	The Whited and Wu (2006) index, a measure of firms' financial constraints calculated as follows: $-0.091 \times (\text{Cash flow to total assets}) - 0.062 \times \text{Dummy_dividend} + 0.021 \times \text{Long term debt} - 0.044 \times \ln(\text{Assets}) + 0.102 \times \text{Industry sales growth} - 0.035 \times \text{Firm's sales growth}$.	Same as above

Appendix B

Additional Tests

Appendix IV.B. 1. The impact of readability on debt choice (Public debt)

	<i>readability</i>				<i>readability_s</i>			
	-1	-2	-3	-4	-5	-6	-7	-8
Readability measure	0.029 (-.58)	0.035 (-.647)	.269*** -5.517	.293*** -5.645	0.007 (-.956)	0.009 (-1.118)	.04*** -5.334	.043*** -5.342
size	11.101*** -78.065	10.967*** -71.509	10.426*** -73.483	10.303*** -67.262	.53*** -77.984	.523*** -71.384	.498*** -73.436	.492*** -67.157
leverage	.405*** -21.422	.436*** -22.57	.4*** -20.904	.426*** -21.831	.158*** -21.418	.17*** -22.559	.155*** -20.866	.166*** -21.799
tangibility	-0.004 (-.577)	-0.01 (-1.023)	-0.012 (-1.567)	-.017* (-1.675)	-0.003 (-.475)	-0.009 (-.972)	-0.01 (-1.503)	-0.015 (-1.617)
profitability	-.058** (-2.17)	-0.033 (-1.211)	-.061** (-2.221)	-0.035 (-1.261)	-.026** (-2.174)	-0.015 (-1.213)	-.027** (-2.208)	-0.015 (-1.255)
tobin	.79*** -2.918	.767*** -2.752	.883*** -3.242	.814*** -2.906	.022*** -2.915	.022*** -2.76	.024*** -3.168	.023*** -2.865
zscore	-1.748*** (-11.321)	-1.761*** (-11.01)	-1.677*** (-10.622)	-1.66*** (-10.138)	-.139*** (-11.26)	-.14*** (-10.948)	-.133*** (-10.553)	-.132*** (-10.056)
_cons	-4.162 (-.966)	-1.523 (-.333)	-34.279*** (-7.786)	-34.164*** (-7.24)	0 0	0 0	0 0	0 0
Observations	16134	16134	16134	16134	16134	16134	16134	16134
Adj R ²	0.172	0.183	0.209	0.22	0.172	0.183	0.209	0.22
Year FE	No	No	Yes	Yes	No	No	Yes	Yes
Industry FE	No	Yes	No	Yes	No	Yes	No	Yes

This table presents the regression results for the impact of 10-K reports readability on firm's debt choice. The dependent variable is the proportion of public debt to total debt. We use *readability* for the columns (1) through (4) and *readability_s* for the columns (5) through (8), as the firm's readability measures. Year fixed effects and Industry fixed effects are first added separately, then jointly, to the regression in columns (2), (3), and (4), respectively. Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

Appendix IV.B. 2. Alternative readability measures (Public debt)

	(1) file_size	(2) length	(3) lexical_var
file_size	4.287*** (17.696)		
length		2.108*** (2.91)	
lexical_var			6.475*** (3.941)
size	12.017*** (69.87)	10.981*** (60.022)	11.05*** (61.448)
leverage	.436*** (20.973)	.437*** (20.652)	.435*** (20.649)
tangibility	.001 (.124)	0 (.02)	-.001 (-.066)
profitability	-.029 (-.964)	-.034 (-1.098)	-.035 (-1.131)
tobin	1.112*** (3.557)	.985*** (3.113)	1.003*** (3.175)
zscore	-2.124*** (-11.822)	-1.954*** (-10.671)	-1.979*** (-10.79)
_cons	25.331*** (7.074)	-9.537 (-1.301)	19.32 (1.519)
Observations	14318	14318	14318
Adj R ²	.315	.301	.301
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

This table presents the regression results for the impact of 10-K reports readability on firm's debt choice using three alternative measures of readability. More specifically, we use *file size*, *length*, and *lexical_var* as alternative measures through columns (1) to (3), respectively. The dependent variable is the proportion of public debt to total debt. Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

Appendix IV.B. 3. Alternative estimates methods (Public debt)

	(1) lagged	(2) FFE	(3) WLS	(4) GEE	(5) Tobit
readability	.227*** (3.993)	.083 (1.129)	.313*** (17.717)	.324*** (5.19)	.585*** (4.516)
size	10.847*** (67.052)	.157 (.224)	7.646*** (82.804)	7.152*** (23.012)	9.089*** (10.843)
leverage	.427*** (20.125)	.317*** (11.695)	.291*** (47.107)	.351*** (17.074)	.706*** (16.42)
tangibility	.003 (.313)	-.042** (-2.165)	.025*** (5.986)	-.003 (-.219)	-.052* (-1.67)
profitability	-.094*** (-3.047)	.024 (.838)	.059*** (7.366)	.03 (1.282)	.112** (2.134)
tobin	1.135*** (3.669)	-.762** (-2.264)	.142 (1.628)	.321 (1.164)	-.033 (-.053)
zscore	-1.518*** (-8.312)	-.165 (-.56)	-1.136*** (-18.415)	-1.253*** (-7.159)	-1.972*** (-4.592)
_cons	-12.151** (-2.45)	52.649*** (7.776)	20.282*** (9.029)	23.136*** (3.218)	7.119 (.361)
Observations	13852	16126	16134	16134	16134
Adj R ²	.309	.686	.z	.z	.z
Industry FE	Yes	No	Yes	Yes	Yes
Firm FE	No	Yes	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes

This table presents the regression results for the impact of 10-K report readability on firm's debt choice. The dependent variable is the proportion of public debt to total debt. We use *readability*, as the firm's readability measure. The lagged readability is used as the measure of the firm's readability in column (1). Firm fixed effects are added in column (2). Weighted least squares, generalized estimation equation, and Tobit regressions' results are reported in columns (3) to (5), respectively. Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

Appendix IV.B. 4. Endogeneity Treatment: Quasi-natural experiment (Public debt)

	Dependent variable		Placebo events				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	readability	Bank debt	2003	2004	2005	2006	2007
Treated*Post	.39 (1.514)	-5.329 (-1.61)	-1.961 (-.552)	-.221 (-.067)	1.926 (.592)	3.192 (.985)	4.145 (1.262)
Treated	-14.713*** (-69.57)	5.941** (2.118)	2.45 (.833)	.292 (.11)	-.478 (-.182)	2.087 (.789)	.684 (.253)
Post	-.407** (-2.441)	1.184 (.517)	2.759 (1.475)	-4.177** (-2.139)	-10.824*** (-5.505)	-14.435*** (-6.927)	-11.898*** (-5.38)
size	-.042 (-1.081)	11.127*** (25.921)	8.918*** (22.467)	9.405*** (23.152)	9.897*** (23.643)	9.263*** (21.364)	10.062*** (22.896)
leverage	-.004 (-.957)	.448*** (7.807)	.435*** (9.095)	.471*** (10.055)	.553*** (11.159)	.552*** (10.91)	.54*** (10.516)
tangibility	.002 (.989)	.019 (.614)	-.066*** (-2.66)	-.016 (-.622)	-.005 (-.174)	0 (.005)	.035 (1.208)
profitability	.001 (.239)	.129** (2.104)	-.094 (-1.153)	-.188** (-2.451)	-.151* (-1.933)	.151** (2.298)	.068 (1.111)
tobin	-.022 (-.309)	-.634 (-.821)	1.118 (1.466)	1.314* (1.688)	1.011 (1.366)	.733 (.967)	.42 (.52)
zscore	.073** (2.352)	-1.404*** (-3.728)	-1.334*** (-2.725)	-1.11** (-2.5)	-1.1** (-2.429)	-1.487*** (-3.601)	-1.452*** (-3.832)
_cons	-78.362*** (-232.811)	-38.557*** (-9.32)	-8.881** (-2.275)	-13.378*** (-3.471)	-17.353*** (-4.218)	-14.086*** (-3.292)	-23.746*** (-5.557)
Observations	1862	1862	2583	2578	2388	2256	2138
Adj R ²	.891	.374	.223	.229	.262	.279	.3
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table presents the regression results for the impact of 10-K report readability on firm's debt choice. The dependent variable is the readability score, in column (1), and the proportion of public debt to total debt in column (2). We use *readability* as the firm's readability measure. The Plain Writing Act (PWA), ratified in October 2010, is used as the exogenous shock to readability. A firm falls into the treatment (control) group if its readability score before the PWA ratification is in the bottom (top) quartile of its distribution. Accordingly, we create a binary variable *Treated*, that is equal to one for treated firms and zero otherwise. If an observation is within the post-PWA period, we set *Post* to one. For the pre-PWA period, we set it at zero. Finally, we create an interaction variable, *Treated*Post*, with the two abovementioned binary variables to measure the average treatment of enhanced readability. We repeat the exercise around 5 placebo events (before October 2010). The results for the placebo test are reported in columns (3) to (7). Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

Appendix IV.B. 5. Additional control variables (Public debt)

	(1) <i>Fluidity</i>	(2) <i>Institutional</i>	(3) <i>Big_auditor</i>	(4) <i>All</i>
<i>readability</i>	.353*** (6.337)	.115* (1.663)	.088 (1.277)	.172** (2.367)
<i>size</i>	10.342*** (65.828)	9.952*** (42.307)	10.375*** (50.539)	9.985*** (41.719)
<i>leverage</i>	.424*** (21.493)	.516*** (19.576)	.519*** (19.675)	.508*** (19.197)
<i>tangibility</i>	-.003 (-.335)	-.005 (-.408)	-.012 (-.921)	-.003 (-.235)
<i>profitability</i>	-.028 (-.99)	.021 (.494)	.024 (.565)	.026 (.61)
<i>tobin</i>	.838*** (2.933)	.883** (2.233)	1.015*** (2.585)	.859** (2.159)
<i>zscore</i>	-1.667*** (-10.14)	-2.136*** (-7.491)	-2.081*** (-7.335)	-1.954*** (-6.792)
<i>Fluidity</i>	.778*** (6.561)			.741*** (4.65)
<i>Institutional</i>		6.229*** (3.466)		5.15*** (2.825)
<i>Big_auditor</i>			-1.003 (-1.25)	-.957 (-1.18)
<i>_cons</i>	-2.282 (-.482)	-17.188*** (-2.799)	-17.857*** (-2.896)	-16.259*** (-2.587)
Observations	15869	9551	9551	9414
Adj R ²	.285	.306	.305	.307
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

This table presents the regression results for the impact of 10-K report readability on firm's debt choice. The dependent variable is the proportion of public debt to total debt. We use *readability*, as the firm's readability measure. We include three additional control variables (i) *fluidity*, a proxy for product market competition, (ii) *institutional*, the percentage of firm's shares held by institutions, and (iii) *Big_auditor* a binary variable that takes the value of one when the company is audited by one of the Big 4 audit companies and zero otherwise. Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

Appendix IV.B. 6. Cross-sectional heterogeneity: The role of information asymmetry (Public debt)

	(1) <i>Analysts</i>	(2) <i>PIN</i>	(3) <i>dltprt</i>	(4) <i>dinvprt</i>	(5) <i>Institutional</i>	(6) <i>fluidity</i>
<i>READ*HIGH</i>	.01 (.162)	.033** (2.158)	-.099* (-1.712)	-.123** (-2.075)	.057 (.984)	.271*** (4.907)
<i>READ*LOW</i>	.062 (.948)	-.091*** (-6.578)	.182*** (3.17)	.1* (1.733)	.11* (1.869)	.323*** (5.728)
<i>size</i>	10.238*** (38.847)	8.384*** (26.757)	6.356*** (25.552)	7.548*** (32.334)	9.963*** (46.763)	10.348*** (65.694)
<i>leverage</i>	.538*** (22.391)	.552*** (20.981)	.37*** (16.558)	.517*** (24.06)	.509*** (19.265)	.428*** (21.687)
<i>tangibility</i>	-.005 (-.362)	-.026* (-1.846)	-.026** (-2.344)	-.024** (-2.228)	-.003 (-.243)	-.004 (-.373)
<i>profitability</i>	-.007 (-.2)	-.016 (-.421)	-.003 (-.094)	-.005 (-.173)	.016 (.371)	-.037 (-1.326)
<i>tobin</i>	1.167*** (3.321)	.468 (1.116)	1.253*** (3.95)	.72** (2.265)	.941** (2.393)	.864*** (3.022)
<i>zscore</i>	-1.808*** (-8.036)	-2.201*** (-9.489)	-1.647*** (-8.841)	-1.732*** (-9.345)	-2.107*** (-7.426)	-1.666*** (-10.12)
<i>_cons</i>	-25.337*** (-4.216)	-11.358*** (-4.379)	8.63* (1.68)	-3.361 (-.662)	-16.293*** (-3.056)	-2.353 (-.486)
Observations	11154	8890	13428	13428	9551	15869
Adj R ²	.3	.268	.315	.303	.307	.285
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

This table presents the regression results for the impact of 10-K report readability on firm's debt choice. The dependent variable is the proportion of public debt to total debt. We use *readability*, as the firm's readability measure. We consider the number of analysts following a firm, and the probability of informed trade (*PIN*) in columns 1 and 2, respectively. *Dltprt*, a dummy variable that takes one if the firm has an S&P long-term debt rating, and *dinvprt*, a dummy variable that takes one if the firm has an investment grade S&P long-term rating, are in columns (3) and (4). Finally, we consider Institutional, the percentage of firm's shares held by institutions, and fluidity, a proxy for product market competition, in columns (5) and (6), respectively. For each one of these moderating variables, we generate a dummy variable *HIGH* (*LOW*) that takes the value of one whenever the variable is above (below) the median of the distribution and a value of zero otherwise. *READ*HIGH* (*READ*LOW*) is the interaction term between the firm's readability score and the dummy variable *HIGH* (*LOW*). Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

Appendix IV.B. 7. Cross-sectional heterogeneity: The role of financial constraints (Public debt)

	(1) <i>Size</i>	(2) <i>HP</i>	(3) <i>KZ</i>	(4) <i>WW</i>
<i>READ_HIGH</i>	.203*** (3.796)	.235*** (4.076)	.186*** (3.227)	.193*** (3.337)
<i>READ_LOW</i>	.337*** (6.319)	.122** (2.121)	.173*** (2.956)	.134** (2.301)
<i>size</i>	8.194*** (32.873)	8.407*** (32.082)	10.165*** (59.792)	9.316*** (37.337)
<i>leverage</i>	.411*** (20.656)	.469*** (21.861)	.506*** (20.69)	.49*** (23.006)
<i>tangibility</i>	-.009 (-.865)	-.022** (-2.043)	-.016 (-1.471)	-.019* (-1.762)
<i>profitability</i>	-.053* (-1.921)	-.028 (-.937)	-.02 (-.658)	-.025 (-.841)
<i>tobin</i>	.878*** (3.12)	.943*** (3.089)	.984*** (3.192)	.842*** (2.733)
<i>zscore</i>	-1.586*** (-9.738)	-1.763*** (-9.884)	-1.831*** (-10.077)	-1.792*** (-9.881)
<i>_cons</i>	10.017** (2.081)	1.646 (.316)	-10.587** (-2.091)	-5.745 (-1.117)
Observations	16134	14062	13926	13926
Adj R ²	.29	.287	.283	.285
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

This table presents the regression results for the impact of 10-K report readability on firm's debt choice. The dependent variable is the proportion of public debt to total debt. We use *readability*, as the firm's readability measure. *Size* is the firm's size. *HP* is the Hadlock and Pierce (2010) financial constraint index. *KZ* is the Kaplan and Zingales (1997) financial constraint index. *WW* is the Whited and Wu (2006) financial constraint index. For each one of these moderating variables, we generate a dummy variable *HIGH* (*LOW*) that takes the value of one whenever the variable is above (below) the median of the distribution and a value of zero otherwise. *READ*HIGH* (*READ*LOW*) is the interaction term between the firm's readability score and the dummy variable *HIGH* (*LOW*). Sample period: 2001-2018. Beneath each coefficient estimate, the robust *t*-statistic, clustered at the firm and year levels, is reported. The superscripts asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Definitions and data sources for the variables are provided in the Appendix.

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CONCLUSION

According to the Pecking order theory, debt is one of the principal financing components to fund expansionary projects. Over the past decades, debt choice and firms' strategic decisions about optimal capital structure have attracted the attention of both academics and practitioners. However, despite many empirical advances, there is still room to investigate the topic and shed light on unexplored areas and main determinants of firms' debt choices. The present dissertation contributes to the ongoing debate by performing three related empirical essays. The first essay (Chapter II of this dissertation) investigates the relationship between CSR and bond debt issuance. Using a panel of 19,208 listed companies across 40 countries over 2003 -2016, we found that firms with higher CSR performance are more prone to substitute less information-sensitive debt instruments, i.e., bank loans, with more sensitive ones, i.e., public debt. We thus demonstrate that higher CSR performance is likely to assuage information asymmetries concerns which makes worthless the scrutiny of banks' monitoring. Moreover, this finding is robust for a series of tests, including endogeneity tests, alternative regression techniques, and a cross-sectional heterogeneity analysis at the country level.

The second essay (Chapter III of this dissertation) examines whether the comparability of a firm's financial statements influences debt choice. Using 14,872 firm-year observations over 2001-2018, we document a positive and substantial link between financial statements comparability and public debt proportion. Our findings persist even after controlling for within-firm financial reporting quality, using alternative regression models as well as alternative comparability measures. We also show that our findings are not driven by endogeneity concerns. Finally, cross-sectional analyses suggest a stronger link between comparability and public debt for opaque and financially restricted companies.

The final essay (Chapter IV of this dissertation) explores the relationship between the readability of firms' narrative disclosures and debt selection decisions. We anticipate that improved readability will reduce information asymmetries, meaning that firms will shift from less information-sensitive debt, i.e., bank loans, to

more information-sensitive debt instruments, i.e., public debt. We establish a negative and significant relationship between the readability of a firm's narrative disclosures and its reliance on bank loans using a sample of 16,532 firm-year data spanning over 2001-2018. Our findings remain robust after adjusting for various readability metrics, additional control variables, and alternative regression parameters. Furthermore, we demonstrate that endogeneity concerns are not likely to erode the validity of our findings.