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Essays on the Corporate Bond Markets

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À Aurore.

« L’Université de Strasbourg n’entend donner ni approbation ni improbation aux opinions exprimées dans cette thèse. Ces opinions doivent être considérées comme propres à leur auteur. »

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Brief Contents

Introduction

The corporate bond market emerged in the Netherlands in the late sixteen century. Its first use was to fund long-distance trade. In that purpose, the Dutch East India Company issued its first bond in 1604 to secure the route to India (Gelderblom and Jonker (2006)). Other European countries gradually implemented the Dutch innovation, which help to reduce their borrowing rates (Homer (1975)). Over the course of the years, this type of funding became increasingly important for large capitalistic ventures. Corporate bonds were issued notably to fund large infrastructures such as railways (Kindleberger (2005)). Amid important crisis periods (Giesecke et al. (2011)), the bond market kept developing and contributed to financial development (Kuran (2012)).

This dissertation focuses on the recent developments characterizing this market. In the last decade, the corporate bond market has considerably expanded and become a major source of funding for companies.[1] In 2013, corporate bond markets reached $49 trillion, almost three times their size in the early 2000's. Bonds turn to be increasingly important to fund the companies. In developed countries, they represent 169% of the GDP on average in 2013, with an increasing number of companies relying on bond issues for their financial needs. The market activity has increased from $0.9 trillion in 2000 to $3.2 trillion of bonds issued in 2013. As a consequence, one-quarter of the corporate financing in 2012 are bonds.

While developed countries exhibit mature bond markets, the picture is more contrasted in emerging countries. The depth of the bond market is much less important. On average, the bond market only represents 24% of the GDP. However, emerging countries are now the main contributors to bond markets development. From 2000 to 2013, twenty-seven new economies create a domestic corporate bond market. While emerging economies gather 5% of the issues in 2000, they represent in 2013 30% of the market. The pace of development of corporate bond markets in emerging economies is fast. The size of the market has tripled in ten years, reaching $6.9 trillion in 2014. Nonetheless, the situations are very different across countries. The three largest markets, China, South Korea and Brazil, total 70% of the emerging corporate bond market. China has by far the largest bond market, which totals $2.7 trillion in

[1] The following figures come from the OICV-IOSCO Reports "Corporate Bond Markets: A Global Perspective" (Tendulkar and Hancock (2014)) and "Corporate Bond Markets: An Emerging Perspective" (Tendulkar (2015)).

2014. It represents three times the size of the next emerging country (South Korea) and is more than the combined size of the nine other countries in the top 10.

These figures underline the major role bond markets are now playing in corporate financing across the world and their increasing importance in emerging countries. This situation elicits two questions which constitute the main focus of this dissertation. **Why do firms choose the bond market and what are the consequences of this choice on firm value?**

Seminal literature on corporate finance and funding choices stresses the irrelevance of an equity-debt trade-off. Modigliani and Miller (1958) develop a fundamental framework where there is no reason for a firm to prefer either equity or debt. Yet, the main contribution of this model is to highlight the very reasons why the firms do prefer some type of funding over another. Challenging the hypothesis underlying their results, Modigliani and Miller (1958) formally demonstrate the mitigating role of corporate income tax and already evocate how diverging interests between management and shareholders can alter their results.[2] A vast literature pursues this approach and details the factors affecting firms' financing choices. This literature challenges the hypothesis of Modigliani and Miller's irrelevance theorem through two main axes: information asymmetries and the principal-agent problem.

Information asymmetries occur when some agents are better informed than their counterparts. In his seminal work, Akerlof (1970) shows how information asymmetries affect a market. Under asymmetric information, sellers of products of good quality eventually leave the market and only bad products remain. Myers and Majluf (1984) extend this reasoning to the firm's financing choices. They demonstrate that information asymmetries increase the cost of capital. Consequently, the way of funding which comprises the more information asymmetries is also the more costly for the firm. They use this approach to underpin a pecking order in the firm's funding choice, an idea which had already been developed by Donaldson (1969). Following the pecking order approach, the firm will select first the way of funding which includes the minimum of information asymmetries and then move toward securities with higher degree of information asymmetries. The reason is that the firm pays an information premium which increases the cost of capital (Stein (1992)). Eventually, the pecking order predicts that the firm will first use its own resources and then move toward debt-like funding and then equity-like funding.

[2] The authors notably stresses that profits are regarded as dividend in their model, an assumption which holds "as long as management is presumed to be acting in the best interests of the stockholders" (p.266).

A crucial aspect of Myers and Majluf pecking order is that it does not postulate any agency problem in the firm. The interests of all stakeholders and management are aligned. Hence, the predictions of the theorem are purely based on information asymmetries. Myers (1984) puts it in its "Capital Structure Puzzle" paper (p.576):

"I have chosen not to consider models which cut the umbilical cord that ties managers' acts to stockholders' interests."

Aside from information asymmetries, the literature builds on the diverging interests between management and investors to explain the capital structure of the firms. While Berle and Means (1932) had already introduced agency problems in modern corporations, the development of the literature accelerates with the seminal paper of Jensen and Meckling (1976). Diverging interests among investors (both bondholders and stockholders) and management result in agency costs which decrease the value of the firm. Jensen and Meckling (1976) identify three components of these costs: the monitoring costs, the bonding costs and residual costs. These agency costs appear in several ways: overinvestment (Stulz (1990)), underinvestment (Berkovitch and Kim (1990)), debt overhang (Myers (1977)), empire building (Jensen (1986)), expropriation (Faccio, Lang, and Young (2001)) and perquisites (Yermack (2006)).

The existence of agency costs support a trade-off theory. Firms' capital structure is determined by the agency costs and market imperfections such as the tax-shield effect of debt (Modigliani and Miller (1963)), the financial distress costs (Gruber and Warner (1977)), investors' taxation (DeAngelo and Masulis (1980)) and even the impact of employees well-being (Verwijmeren and Derwall (2010)). Following a marginal reasoning, the firm issue debt until the benefit of financial leverage is overweighed by its costs.

Beside information asymmetries and agency costs, the literature emphasizes the role of management habits. Miller (1977) proposes a "neutral mutation" hypothesis, where managers fall into some financing pattern and are reluctant to adopt new ways of funding. In that view, explaining the firm capital structure by a financial reasoning is somehow pointless, all the more so as the firm capital structure has no impact on the firm value. This idea has been revisited more recently by Welch (2004) who documents a "managerial inertia": 40% of the variation in the leverage of US firms between 1962 and 2000 is explained by the variation of the stock prices. On the opposite, theories offer a proactive view of the management who can time the market and sell stocks when the firm is over-valuated, exploiting the information asymmetries external investors are facing (Taggart (1977)).

Empirical literature successively tests these models but fall short of a consensus. Flannery and Rangan (2006), Frank and Goyal (2009) and Zhou et al. (2016) find evidence of a target capital structure with a speed of adjustment which support the trade-off theory. On the contrary, Shyam-Sunder and C. Myers (1999), de Haan and Hinloopen (2003) and de Jong, Verbeek, and Verwijmeren (2011) find evidence supporting the pecking order theory. While studies support stable capital structures (*e.g.* Lemmon, Roberts, and Zender (2008) and Graham, Leary, and Roberts (2015)) which could support the neutral mutation hypothesis, De Angelo and Roll (2015) emphasize the variation of capital structures over time. Last, papers find evidence supporting both the presence (*e.g.* Loughran and Ritter (1997), Baker and Wurgler (2002)) and the absence (Leary and Roberts (2005), Hovakimian (2006)) of market timing.

Far from being conclusive, the empirical literature still attempts to explain firms' capital structure and the use of debt. On corporate bonds, results are even more elusive. A large literature explain bonds' characteristics, like yield (*e.g.* Campbell and Taksler (2003), Helwege, Huang, and Wang (2014), maturity (Guedes and Opler (1996), Norden, Roosenboom, and Wang (2016), Badoer and James (2016)) and liquidity (Chen, Lesmond, and Wei (2007), He and Milbradt (2014)). However, few papers investigate the reasons why firms issue bonds in the first place.

A strand of literature compares bank loans and corporate bonds in an attempt to explain the choice of bonds. Financial intermediaries help reducing the underinvestment stemming from information asymmetries in the debt market (Stiglitz and Weiss (1981)). Diamond (1984) underline the monitoring role of banks compared to the bond market. While this monitoring is costly, Fama (1985) demonstrates that it helps firm accessing debt, by reducing the information asymmetries and providing more flexible renegotiation terms. Bolton and Freixas (2000) construct a comprehensive model explaining the choice among equity, bonds and bank debt under asymmetric information. The choice of bank debt is mainly due to the greater flexibility of banks and their ability to reduce information asymmetries while bonds help avoiding intermediation costs. Hence, bank debt is particularly beneficial for small firms which are riskier and do not have a credit reputation. On the contrary, large firms benefit more from arm's length capital market. Petersen and Rajan (1994), Cantillo and Wright (2000) and Altunbaş, Kara, and Marqués-Ibáñez (2010) provide evidence underpinning these theories.

In this dissertation, I offer to dig deeper the reasons explaining a bond issue as well as the consequences on the firm value. I build on the corporate governance approach developed

above. I focus part of this work on the emerging markets which display specific governance issues (Young et al. (2008)) and are still scarcely investigated by the literature.

The first chapter investigates the role of creditors' rights and information on bond issues. Using a large cross-country database on bond issues, I isolate the role of creditors' laws on the probability for a firm to issue a bond, the amount issued and the maturity of the issues. I disentangle the role of agency costs and information asymmetries and take into account the impact of firm characteristics.

The second chapter draws on the vast literature on stock market reaction to bond offering. Using a meta-analysis methodology, I offer a conclusive answer to the value shareholders attribute to a bond issue and bring back together diverging results.

The third chapter focus on the specific issues of the Chinese corporate bond market which is by far the largest in emerging countries and the largest in the world in term of private placements (Çelik, Demirtaş, and Isaksson (2015)). I investigate how China specific governance issues affect the value created by a bond issue. I document the role of state-ownership, management ownership and concentrated ownership, which are all of three especially large in Chinese corporations.

Last, the fourth chapter offers an inspiring demonstration of how behavioural factors can impact firm's value. Using the difference in valuation by shareholders between *sukuk* (Islamic bonds) and bonds issues during Ramadan, I isolate a religious component in investors' reaction. I show that the value of this religious component is not negligible and can be attributed to the religiosity of investors. This chapter emphasizes both the specific issues of the bond markets in emerging countries and the difficulty to define the boundary of what value is in finance.

First Chapter - Issuing Corporate Bonds: The Role of Legal Environment

What are the consequences of creditors' rights and creditors' information on the corporate bond market? Does a firm access more easily the bond market when creditors' rights are stronger and when they have a better knowledge of the financial situation of the firm and its records of borrowings? Do poorly protected creditors still lend money if they know the risks they are taking? These questions are fundamental for the development of the corporate bond market. Their answers can explain why the market has more expanded in some countries and which legal environment should be promoted to favour its development.

The law and finance literature emphasizes the impact of investors' protection on the capital markets (La Porta et al. (1997)), on the ownership concentration (La Porta et al.

(1998)), on the protection of outsiders (Johnson et al. (2000), La Porta et al. (2000)) and more recently on the firm value (McLean, Zhang, and Zhao (2012)) and the capital structure (Fan, Titman, and Twite (2012)). Yet, no paper has investigated the impact of investors' protection on the corporate bond market itself. Gu and Kowalewski (2016) provide a first attempt to link the corporate bond market development to creditors' rights. They investigate how the relative size of the corporate bond market to the equity market can be explained by investors' rights. Yet, they only analyze the relative size of the two markets and provide a country-level investigation.

The objective of this chapter is to estimate the impact of creditors' rights and information on the probability for a firm to issue a bond, on the amount issued and on the maturity employed. I build the analysis on two main hypotheses. First, higher creditors' rights increase the monitoring of management and reduce moral hazard. Doing so, it should facilitate the access to the bond market and increase the amount issued. It can also have an impact on the maturity issued by either reducing the liquidity premium and facilitate the use of long-term maturities (Aghion, Bolton, and Tirole (2004)) or by reducing the risk of liquidity and promote the use of short-term debt (Diamond (1991)).

Second, better creditors' information is also expected to facilitate the access to the bond market and the amount issued. When creditors are better informed on the quality of the borrower, they can more accurately price the underlying risk and offer lending. Hence, higher creditors' information is expected to reduce the credit rationing on the corporate bond market. Creditors' information can also have an impact on the maturity of the issues. Better information of creditors helps them engaging in long-term lending by reducing the uncertainties on the issuer (Barclay and Smith (1995)). On the opposite, it also reveals the quality of the borrowers and can force issuers of poor quality to issue short-term debt while comforting high-quality borrowers in the use of short maturities (Diamond (1991)).

I set the analysis at the firm-level. To do so, I collect the data on bond offerings in 38 countries from 2002 to 2006, gathering more than 17,000 issues. Doing so, I obtain precise information on the issues and on the firms. I employ a firm-level analysis, avoiding the methodological concerns with country-level aggregates identified by Holderness (2016).

This study yields three main results. First, when considered separately, both creditors' rights and information exert a positive impact on the access to the bond market and the amount issued. While creditors' rights do not affect the maturity of the issuances, better information of creditors reduce the maturity of the issues. This result is in line with Diamond (1991): when creditors know the quality of the borrowers they are reluctant to provide long-

term debt to issuers of poor quality. On the meantime, good-quality issuers know they can easily roll-over their debt in the future and prefer short-term issues.

If both creditors' rights and information matter when considered separately, only creditors' information is significant when they are considered together. It turns out that informed creditors is more important than protected creditors. When creditors know the risk they take, and how much they can price it, they are ready to lend. Furthermore, this result holds when the legal origin or the governance environment is taken into account. This is particularly encouraging for developing countries: even with higher level of corruption and low level of creditors' protection, these countries can still promote the corporate bond market by offering information. Large progress can be a in that direction since only 38% of the countries in the sample offer a public registry of borrowers' standings.

Last, this chapter demonstrates that firms in a country are not equally affected by creditors' standards. It turns out that firms with the lower level of agency costs and information asymmetries and which are already well established on the corporate bond market are also the one which benefit the most of creditors' protection and information. It promotes additional measures to favour the access to the bond market to firms with higher level of agency costs and information asymmetries. It also stresses the importance of taking into account the role of firm-level characteristics when assessing the impact of law on finance.

Second Chapter - Do Shareholders Value Bond Offerings? A Meta-Analysis

The second chapter provides evidence on the impact of a bond issue on shareholders' value. This question has been widely debated in the literature. Dann and Mikkelson (1984) provide the first investigation on this subject then follow by 28 other studies. The reason of that high number of studies is due to conflicting results. Some papers find a negative reaction of shareholders (*e.g.* Eckbo (1986), Datta, Iskandar-Datta, and Patel (2000)) other report a positive reaction (*e.g.* Kim and Stulz (1988), Miller and Puthenpurackal (2005)) and some an absence of reaction (*e.g.* Mikkelson and Partch (1986), Jung (2009)). As a results, there is no consensus on the impact a bond issue has on equity value.

The question is difficult to settle since theoretical corporate finance provides reasons explaining both a positive and a negative impact of a bond issue on equity value. Accessing the bond market can provide additional value for the shareholders. First, issuing a bond reduces the information asymmetries. Spence (1976) highlights the signal a bond issue sends to investors as the management commit to pay regular coupons and put their position as risk in the case of a bad investment. Second, a bond issue helps aligning the interests of the

management with those of the shareholders as the management is constraint to maximize the firm value to avoid bankruptcy. Furthermore, a debt issue may reduce excessive undedicated cash-flows in the hands of management which could have been otherwise misused (Jensen (1986)). Last, issuing a bond also decreases the corporate tax faced by the company through the tax-shield effect of debt (Modigliani and Miller (1963)).

On the other hand, issuing a bond can also hamper shareholders' value. A bond issue can signal a funding gap (Miller and Rock (1985)). It can also reinforce management's entrenchment if the proceeds of the bond are undedicated (Jensen (1986)). Last, a bond issue can also excessively increase the default costs in case of bankruptcy (Gruber and Warner (1977)).

These opposing theoretical predictions partly explain that empirical literature falls short finding conclusive results. Furthermore, the studies use different methodologies, investigate the effect in different countries and exhibit different sample size. As a result, one can hardly compare these studies without taking into account these differences. In this chapter, I use a meta-analytical methodology. I first compute an overall effect and offer a concluding answer to the value shareholders give to a bond issue. Second, I explore the reasons explaining the divergence in the previous results. Doing so, a meta-analysis also helps offering methodological recommendations as well as new avenues for research.

The main result is a positive reaction of shareholders to a bond issue. While this result is robust when the precision of the studies is taken into account, it also relies on methodological choices. Through a multi-regression analysis, I identify two factors explaining the diverging results in the literature: the choice of the event date and the length of the observation window. Furthermore, the significance of the results is affected by the sample screening and the statistics employed to test shareholders' reaction.

Overall, this chapter offers a conclusive answer on the findings of the previous literature. It provides recommendation for future research such as the use of robustness tests and alternative statistics.

Third Chapter - Bond Offerings in China: The Role of Ownership

This chapter explores the consequences of a bond issue for the firm value in China. Two reasons explain the choice of China. First, the country constitutes by far the largest corporate bond market among emerging countries as explained above. Second, the country has specific governance issues (Xu and Wang (1999), Morck and Yeung (2014)). High levels of state-ownership as well as ownership concentration are likely to affect the value a bond

issue entails. This question is especially interesting as these features are shared with many other emerging countries (Young et al. (2008)). In this paper, we explore the consequences of Chinese firms' ownership structure on the value created by a bond issue.

A key feature of Chinese corporations is state-ownership. The state, either at the local or central level, is often the main shareholder. Tian and Estrin (2008) find that the state was the largest shareholder in 43.9% of Chinese companies in the early 2000's. Furthermore, Peng, Wei, and Yang (2011) note that these figures only account for direct ownership. When pyramidal ownership is taken into account, 80% of the listed companies turn to be owned by the state.

State ownership can have a critical impact in a bond issue. On the one hand, investors may fear the proceeds of a bond issue to be inadequately invested by the state. Several papers show that political objectives, the lack of incentives and political interferences which can influence the management and lead to unprofitable investment projects (*e.g.* Shirley and Walsh (2001), Wang and Judge (2010)). However, state ownership can also bring positive value to a bond issue. State-owned firms enjoy a privileged access to enterprise bonds to undertake nation-wide projects supported by the state. These bonds are larger, more liquid, and guaranteed by the state (Reuters (2015)). As a consequence, they are a cheaper and represent a more secured way of funding for the firm.

The second striking element on Chinese companies is ownership concentration. Allen, Qian, and Qian (2005) stresses the role of family and conglomerate ownership, most of the time through pyramidal structures (Xiao and Zhao (2014)). Greater ownership concentration can increase firm value by improving the control shareholders have on management in the use of bonds' proceeds. However, highly concentrated ownership also paves the way for minority investors' expropriation (Shleifer and Vishny (1997)) especially in China where governance standards are low (Allen, Qian, and Qian (2005)). As a consequence, controlling shareholders have more leeway to tunnel the proceeds of the bond out of the firm (Johnson et al. (2000), Faccio, Lang, and Young (2009)).

Last, Chinese firms are characterized by high-level of management ownership, the main owner being also frequently the CEO and appointing his relatives in the board (Chen et al. (2011)). In one way, management ownership helps resolving any agency conflict between the owners of the firm and the management. Yet, as for concentrated ownership, the management may be tempted to extract firm's value, and in that case the bond's proceeds, at the expense of the shareholders.

We employ an event-study methodology to investigate the consequences of a bond issue on equity value. Three main results emerge. First, we observe a positive shareholders' reaction to a bond issue, which underlines the positive signal a firm sends when accessing the bond market. This turns to be especially true in China, where the access to the bond market is reserved to a tiny portion of the firms and demonstrates close links with the administration. We find that ownership is a key determinant of the value created by a bond offering in China. State-owned companies benefit from an additional positive effect in comparison with private companies.

We also gather evidence of a non-linear relation between management ownership and the value a bond provides to shareholders. Management ownership first increases the value a bond issue entails for shareholders. Up to a small stake in the firm (5%), management ownership helps aligning their interests with those of the shareholders. However, above 5% and up to an upper threshold (44%), management ownership decreases the value a bond provides to shareholders. In that interval, management interests seem not to be aligned with those of shareholders. On the contrary, it turns out that shareholders suspect the management to extract the proceeds of the issue at their expense. In the case of high-level of management ownership (above 44%), the reaction is positive anew. With a high stake in the firm, the management's interest is aligned with minority shareholders and the bond issue increase the value of the company.

Overall, this chapter offers an answer to the effect of a bond issue in China. It shows that specific governance standards in the country generate a specific impact of a bond issue on the firm value. It promotes further research on the Chinese corporate bond market and underlines the importance to consider emerging countries specific issues and their impact on financial markets.

Fourth Chapter - Religiosity vs. Well-Being Effects on Investor Behaviour

This last chapter addresses an original question on firm value, meaning the potential religious considerations of traders. Malaysia quickly expanding *sukuk* market (Islamic bonds) is grounded on the religious aspect of the securities. The fundamental question it raises is the existence of a religious concern from investors. While the role of religions has been demonstrated in the shaping of economic institutions (*e.g.* Stulz and Williamson (2003)) in market outcomes (Kumar, Page and Spalt (2011)) and in people's economic behavior (Guiso, Sapienza, and Zingales (2003)), its role on financial investors remains uncertain. While professional investors are subject to psychological biases (*e.g.* Barberis and Thaler (2003)) the

lack of information at the investor level (such as his religiosity) prevents the identification of any religious bias. This paper intends to fill this gap in the literature using an innovative identification strategy.

To corner any potential religious behaviour from investors, we follow a twofold strategy. First, we focus on a very specific time-period, the holy month of Ramadan in Malaysia. The choice of Malaysia stems from its very developed bond and *sukuk* market. The month of Ramadan is expected to increase the religiosity of investors, compared to the rest of the year. However, it also increases the well-being of investors who enjoy more vacations and fests. To disentangle the well-being from the religious effect, we compare the value investors give to *sukuk* and bonds during this month. The rationale is that the *difference* in this valuation *during* Ramadan compared to the rest of the year can be attributed to the religiosity of investors (once financial and other economic factors are control for). Hence, we can provide a concrete measure of investors' religiosity.

We find that the reaction of investors to a *sukuk* issue during Ramadan is significantly higher than to a bond. Moreover, the value investors attribute to the religious component of a *sukuk* is not negligible. We identify a higher abnormal return of 1.6% compared to a bond issue. If we compute this abnormal return with the mean capitalization in the sample, it represents an additional USD 9.876 million of equity value only due to this religious aspect. The company can take profit of this religious aspect and time the market: issuing a *sukuk* during the Ramadan instead of the rest of year generates an extra USD 11.576 million of stock value.

We go further and investigate if the issue of *sukuk* or bond during the month of Ramadan provokes a reward/punishment scheme from investors. Can an opportunistic management really take profit of investors' religiosity by issuing *sukuk* instead of bond during the Ramadan? To answer this question, which is the one of investors' credulity, we take into account the past behaviour of the firm. We compare firms which issue both *sukuk* and bonds to the one who only issue *sukuk*. The rationale is that firms who only issue *sukuk*, during or not during the Ramadan, are committed to the *sukuk* market and do not issue *sukuk* during Ramadan in an opportunistic way. We find that investors reward commitment to religious principles. The religious aspect of sukuk only shows up for firms that only issue *sukuk* and refrain from issuing on the bond market.

Overall, this chapter provides evidence of a religious bias in the behaviour of investors. We do not rely on usual proxies of religiosity but directly focus on the actions of investors toward a potential religious situation. We also offer new insights for the Islamic

finance literature. An important difference between *sukuk* and bond does lie in the religious aspect of the security. We also show that management can take profit of this aspect, as long as they show some sort of commitment for investors' religious values.

Chapter One

Issuing Corporate Bonds:

The Role of Legal Environment

Abstract

This paper appraises the impact of creditors' rights and information on bond issues. I find that higher creditors' rights and information ease the access to the bond market, increase the amount issued and reduce the maturity of the issuances. When considered together, the creditors' information is the main determinant. I show that this effect is not uniform across firms: firms with lower level of agency costs and information asymmetries benefit the most of higher level of creditors' rights and information.

JEL Codes: G10; G32; K40.

Keywords: Corporate Bonds; Bond Issues; Creditor Rights; Creditor Information.

1. Introduction

The law and finance literature underlines the role of legal environment in determining the rights entitled to investors, which in turn affects the availability of external funding for the firms. This link is especially pronounced on financial markets, where there are no relational ties to reduce the extent of moral hazard and where investors are scattered, refraining the incentives to engage in monitoring activities. This paper draws on the precedent literature and offers to explore the consequences of different degree of creditors' protection and information on the corporate bond market.

This paper investigates the role of creditors' rights and information on the use of corporate bonds. I focus the analysis on the firm. I consider three elements: the access to the bond market, the amount issued and the maturity of the issuance. Whereas a large literature investigates the role of investors' protection on the capital markets size (La Porta et al. (1997)), the ownership concentration (La Porta et al. (1998)), the extraction of resources by insiders (Johnson et al. (2000)), the firm value (McLean, Zhang, and Zhao (2012)) and the capital structure (Fan, Titman, and Twite (2012)), few studies focus on the corporate bond market. Gu and Kowalewski (2016) recently study the role of legal environment on the corporate bond market. They use an alternative approach by measuring the relative size of the bond market compared to the equity market at the country-level.

Holderness (2016) shows that the widespread use of country aggregates in the law and finance literature has two substantial drawbacks. The first one is conceptual. It restrains the analysis to the country-level and tells nothing on the impact at the firm-level, whereas the very point of the law and finance literature is to emphasize the impact of different level of investors' protection on the financial contracts. The second drawback is methodological. Using country-level data instead of firm-level data causes a severe aggregating bias, by removing the variance within the countries and giving a disproportionate weight to small countries. Holderness (2016) demonstrates that the fundamental results of the law and finance literature do not hold when this bias is taken into account. On the contrary, here, I adopt the firm point of view and directly relate the level of creditors' rights and information on the access to the bond market, the amount of the issue and the maturity issued.

I divide the impact of creditors' status on the bond issues in two elements: agency costs and information asymmetries. The law and finance literature underline the role of legal environment on both agency costs and information asymmetries. For instance, La Porta et al.

(2000) showed how minority shareholders protection against the action of insiders influences the dividend payout ratio and Djankov, McLiesh, and Shleifer (2007) how creditor rights favor the development of private credit. Concerning asymmetries of information, La Porta, Lopez-De-Silanes, and Shleifer (2006) show the role of mandating disclosure on the development of stock market and Djankov, McLiesh, and Shleifer (2007) construct indicators of creditors' information. Here, I estimate separately then concurrently the role of agency costs and asymmetries of information the creditors are facing on the bond issues. I investigate if lower agency costs, through higher creditors' rights, and lower information asymmetries, through credit registries, have an impact on the access the bond market, the amount issued and the maturity of the bonds.

Last, I investigate how the firm's own level of agency costs and information asymmetries affect the link between the creditors' rights and information and the use of the bond market. While previous literature mainly considers the role of the legal environment to be uniform across firms, I offer to distinguish among two potential effects. While better creditors' protection can benefit the most to firms with high level of agency costs and information asymmetries (a *smoothing* effect), it can also benefit more to firms which already exhibit low level of agency costs and information asymmetries (a *reinforcing* effect).

To perform this analysis, I gather the data on the bond issued by companies in 38 countries from 2002 to 2006. I also extract the issuers' balance-sheet and financial data and control for the macroeconomic environment. My key variables for the creditors' rights and information are borrowed from Djankov, McLiesh and Shleifer (2007). In robustness analysis, I control for alternative determinants of the use of the bond market.

The paper yields three main results. First, both creditors' rights and information exert a positive effect on the access to the bond market and the amount issued, and a negative effect on the maturity. Second, when considered altogether, the principal determinant of the bond issues is creditors' information. It turns out that informed creditors matters more than protected creditors. Last, creditors' protection and information do not affect the firms uniformly. Firms with already low level of agency costs and information asymmetries benefit the most of higher creditors' rights and information. These results lead the way to both practical application and further avenues of research.

The remainder of the paper is organized as follows. In section 2, I present the hypotheses underlying the relation between legal environment and the use of corporate bonds. Section 3 details the empirical design. Section 4 displays the results and section 5 offers robustness tests. Last, section 6 concludes.

2. Legal Environment and Corporate Bonds

In this section, I elaborate on the link between the legal environment and the use of bonds by firms. I distinguish between the role of creditors' rights, creditors' information and the mitigating role of the firm's own level of agency costs and information asymmetries. In each section, I present the hypothesis regarding the access to the bond market, the amount issued and the maturity of the issuances.

2.1. The role of creditors' rights

The literature on agency costs emphasizes the diverging interests of outsiders and insiders in a firm. Outsiders include debt holders whereas insiders referred to the management and controlling shareholders. The seminal work of Jensen and Meckling (1976) lays the foundation of this literature. It details the conflicts between insiders and outsiders and its negative impact on the firm's value through agency costs. For creditors, these agency costs consist in avoiding a misuse of the funds lent to the firm. Such a misuse includes overinvestment (Stulz (1990)), underinvestment (Berkovitch and Kim (1990)), empire building (Jensen (1986)), expropriation (Faccio, Lang, and Young (2001)) and perquisites (Yermack (2006)).

The law and finance literature underlines how the level of creditors' protection affects the intensity of agency costs. The law can offer a more protective framework to creditors, by giving them the guarantee to be paid back, the ability to seize collateral and a control over the firm's action, before reorganization and during the reorganization process. A recent literature scrutinizes the role of creditors' protection on the lending market. Djankov, McLiesh, and Shleifer (2007) construct an index of creditor rights over countries. They demonstrate that a better protection of creditors is associated with a better development of the private credit market. Qian and Strahan (2007) show that legal protection of creditors has an impact on the loan ownership, the maturity and the interest rate. Bae and Goyal (2009) find similar results for the enforcement of contracts and the size, maturity and spread of bank loans. Haselmann, Pistor, and Vig (2010) underline the importance of collateral laws on bank lending. At a country-level, Gu and Kowalewski (2016) demonstrate that a better protection of creditors increase the relative size of the corporate bond market over the equity market.

Following this literature, this paper investigates the impacts of the creditor rights on the bonds issued by the firms. I analyze the impact of the protection of creditors on the access to the bond market, the amount issued and the maturity of the issuances. Seminal papers (*e.g.* Holmstrom and Tirole (1997)) demonstrate that higher levels of agency cost discourage the creditors to lend funds. By reducing the agency costs, a better protection of creditors is then expected to positively impact the access to the bond market and the amount issued. Creditors are expected to be more willing to provide funds to the firm if they are more protected in case of a misuse of the bonds proceeds by the insiders.

The role of creditors' rights on maturity is less straightforward. Firms face a trade-off between issuing long-term bonds to secure their financial needs and issuing short-term bonds to benefit from better borrowing conditions. On one hand, Aghion, Bolton, and Tirole (2004) show that markets with a better protection of investors exhibit a lower liquidity premium for long-term debt, inciting the firm to use longer maturities. On the other hand, a better protection of creditors reduce the risk of liquidity and can incite the firms to issue shorter bond to beneficiate from better refunding terms (Diamond (1991)). Hence, higher creditor rights can ease the issue of both long-term and short-term bonds.

2.2. The role of creditors' information

This section details the role of creditors' information on the bond market. The role of information asymmetries in the funding choice of a firm has been put forward by Spence (1977) and yields an important literature. To wrap it up, the creditors' information has an effect on the borrowing market by impacting both the funds available and their price. Seminal work of Akerlof (1970) shows that an adverse selection scheme occurs in the presence of asymmetries of information. Early models relate this phenomenon to credit rationing (e.g. Jaffee and Russell (1976)) and recent literature manage to identify this relation (e.g. Karlan and Zinman (2009)). The credit rationing also goes with a higher cost of borrowing. Theory predicts that investors ask for an information asymmetry premium (Stein (1992)), a result confirmed and refined by empirical studies (e.g. Shyam-Sunder and C. Myers (1999) and Lemmon and Zender (2010)).

The law and finance literature stresses that the legal environment can play a substantial role on the degree of information asymmetries creditors are facing. Depending on the law, firms face different levels of disclosure requirements across countries. Jappelli and Pagano (2002) show that bank lending is higher in countries with private credit bureau and public

credit registers. Djankov, McLiesh, and Shleifer (2007) find a positive relationship between information availability to creditors and the development of the credit market. Brown, Jappelli, and Pagano (2009) show that lower information imperfections increase the availability of funds and reduce their costs for the firm. Overall, the literature concludes that a higher degree of information required by the law benefits to credit funding by reducing the problems associated with information asymmetries.

How does it affect bond issues? Following previous results on the bank loans, more informed creditors is expected to reduce the credit rationing stemming from adverse selection. As such, creditors' information should facilitate the access to the bond market. It should also increase the amount issues by the firms.

Again, the impact of information asymmetries on the maturities of the bonds is less straightforward. Less informed creditors may be less willing to engage in long-term maturity and force entrepreneurs to shorten the maturity of the bonds (*e.g.* Barclay and Smith (1995)). On the other side, less information asymmetries reveals the quality of the firm. Diamond (1991) shows that with private information, borrowers of high quality will turn to short-term debt while borrower of less quality will turn to long-term debt. However, if creditors know the quality of the firm, all firms will issue debt of shorter maturity. High-quality borrowers because they still do not face a liquidity risk and expect better term in the future and low-quality borrowers because creditors will be reluctant to lend in the long-run, knowing the borrower's type. Hence, more informed creditors can either lead to longer maturities by reducing uncertainties for the lender, or shorter maturities by increasing the liquidity premium.

2.3. The role of firms' characteristics

In a country, firms exhibit different levels of agency costs and information asymmetries. Here, I detail the hypothesis that the effect of creditors' protection and information is not uniform across firms but depends on the firm's own level of agency costs and private information. I distinguish two opposed potential effects. First, creditors' status can benefit to the firms with more agency costs and information asymmetries. In this case, legal environment smooth the differences across firms. On the contrary, creditors' protection can benefit the most to firms which already have low level of agency costs and information asymmetries. This can be for instance because these firms already have a debt record: better information of creditors will then help them communicating on their quality and facilitate

their access to the bond market. In that case, legal environment *reinforces* the differences across firms. I use proxies of firms' level of agency costs and information asymmetries to determine which effect prevails over the other.

Borrowing from the literature, I use two indicators of firm's degree of moral hazard which are likely to impact the use of the corporate bond market. First, firms with higher pledgeable assets may be less tempted to undertake moral hazard activities. They either provide more collateral or their assets can more easily be seized by creditors in case of bankruptcy. I employ the tangibility of assets as an indicator of collateral, following notably Frank and Goyal (2009). The second indicator of agency costs I use is the amount of free cash-flows the firms have at their disposal. Jensen (1986) shows how excessive levels of cash in the hand of the management can result in moral hazard and hamper the firm value. As a consequence, firms with large reserve of cash may be more sensitive to creditors' rights when issuing a bond.

To assess the degree of information asymmetries a firm is facing, and the corresponding importance of creditors' information when issuing a bond, I rely on two other firm's characteristics. First, I build on the literature that shows that listed firms display more information than private companies and have books of better quality (*e.g.* Hope, Thomas, and Vyas (2013)). I use the public status of the firm as an indicator of the degree of private information the firm detains. Second, I consider the record of issuances. Firms who frequently use the bond market are better known by the creditors and exhibit lower level of information asymmetry for the borrowers. In each case, I investigate if firms with different level of private information are affected differently by the degree of creditors' information offered by the legal environment.

3. Empirical Design

In this section, I first present the data used for the analysis. I then move on the methodology employed to test the hypotheses.

3.1. Data

To perform this analysis, I use data on legal environment, bond issues, firms' balance-sheet information and macroeconomic variables. I collect indicators of creditors' protection and information asymmetries from Djankov, McLiesh, and Shleifer (2007). They construct an

index of creditor rights over countries (*Creditor Rights*), based on four rights for the lenders: the mandatory consent of creditors when the debtor distributes dividends or file for reorganization; their ability to seize collateral upon reorganization; a seniority of the claimed of secured creditors in case of bankruptcy; the control over the firm during the reorganization process. *Creditor Rights* takes the values from 0 to 4, with being the highest level. I use two indicators of asymmetries of information: *Public Registry* and *Private Bureau*. Each of them is a dummy variable, taking one if a public credit registry or a private credit bureau operates in the country respectively.

To estimate the impact of creditors' rights and information on the bond market, I perform a firm-level analysis. Early literature on law and finance made an extensive use of country-level variables to explain firm-level characteristics (*e.g.* La Porta et al. (1998), Stulz (2005), Demirgüç-Kunt and Maksimovic (1998), Morck, Yeung, and Yu (2000)). Holderness (2016) points out the severe impediments of such an approach which could lead to false inferences due to misleading data aggregation. To overcome this issue and following a recent trend in literature (*e.g.* Qian and Strahan (2007), Fan, Titman, and Twite (2012), McLean, Zhang, and Zhao (2012), I use firm-level data to explain the access to the bond market, the amount issued and the maturity of the issues.

This approach required data on bond issuances which were obtained from the Bloomberg Professional Terminal. The size of the sample is determined by data availability. I extracted all the straight bonds offerings occurring between 2002 and 2006 and having the minimum of information on the issuer. Table 1 details the sample, displaying the number of issues per year, per country as well as the values of the three main indicators used in this study, namely *Creditor Rights, Public Registry* and *Private Bureau* indexes.

The final sample includes 38 countries. It encompasses 17,096 issues. The number of issues per country displays an important heterogeneity, going from one issue in Greece, Pakistan, Sri Lanka and Turkey to 4959 issues in the USA. This heterogeneity stems from the difference in securities markets size across countries and supports a firm-level analysis to avoid equal country weighting (Holderness (2016)). Alongside the number of issues, the table 1 reports the different levels of the creditors' protection and information variables by country. The three key variables present an important degree of dispersion. First turning to the protection of creditors, *Creditor Rights* goes from 0, its lowest value, to 4, the highest value. The mean of the sample is at 2.01 with a standard deviation of 1.05.

The table also underlines the difference between *Public Registry* and *Private Bureau*. While 34 countries have a private bureau establishing credit records, only 13 have a public

registry of credit. Furthermore, only 10 countries have both public and private registries of borrowers' standings.

Overall the sample covers countries with scattered levels of market development and creditors' protection and information, which is useful in identifying the role of the legal environment on the bond market.

I focus the study on three characteristics of the issues: the amount issued by each firm between 2002 and 2006 (*Amount*), the mean maturity (*Maturity,* weighted by the issue size) and the access to the bond market, which is a dummy variable *Bond* taking one each year the firm secures an issuance. Alongside issues characteristics, I obtain the firms' balance-sheets from 2001 to 2006 to control for the firm-level determinants of the funding choices. I use the total assets value (*Total Assets*), the book equity value (*Equity*), the fixed assets as a proportion of total assets (*Fixed Assets*), the leverage (*Leverage*), the current ratio (*Current*), the cash from operation as a proportion of total assets (*Cash*) and the firm's profitability before interest and taxes, scaled by total assets (*Ebit*). All the variables are reported in US dollars. I control the data for reporting errors. Due to important outliers in the distribution of the variables, I winsorize all the firm-level variables at the 1% level within each country.

To control for the country characteristics and the macroeconomic environment, I use macroeconomic variables. Macroeconomic data are extracted from the World Bank database. This includes GDP growth (*GDP growth*), the initial value of GDP (*Initial GDP*), the consumer prices index (*Inflation*), the domestic credit to private sector (*Domestic Credit*), the stock market capitalization to GDP (*Market Capitalization*) the number of companies listed in the country (*Listed Companies*), and the level of taxation (*Taxes*).

When considering the firms' own level of agency costs and asymmetric information, I use four indicators: the tangibility of assets, define as the ratio of net fixed assets to total assets (*Tangibility*); the amount of free cash-flows in the hands of the management, scaled by the total assets (*FCF*); the public status of the firm with a dummy variable *Listed* equals to one if the company is listed; and the logarithm of the number of previous bond issues (*Previous Issues*). I create an interaction of these variables either with *Creditor Rights* or with *Public Registry* and *Private Bureau*.

In robustness analysis I also control for the legal origin using the law origin indicators classification constructed by La Porta et al. (1997). I use dummy variables to distinguish legal origins, namely, French Napoleonic Code (*Civil Law*), English common law (*Common Law*), Germanic code (*German Law*) and Scandinavia law (*Scandinavia Law*). I also build

robustness estimations controlling for the governance environment. I employ two of the World Bank governance indicators for that purpose: the control of corruption (*Control of Corruption*) and the rule of law (*Rule of Law*). Panel statistics on firm-level and country-level variables are given in the table 2.

3.2. Methodology

To investigate the extent of which creditors' rights and information exert a role on the bond market, I use a firm-level panel dataset spanning from 2002 to 2006. As explained above, this dataset includes issues, firm and country-level information.

For explaining how creditors' rights and information exert a role on the amount issued and the maturity of the issuances, I perform a linear cross-sectional analysis. I employ either *Amount* or *Maturity* as dependent variable. *Amount* corresponds to the total amount issued by firms between 2002 and 2006. *Maturity* is the mean maturity of the issuances occurring from 2002 to 2006. The key explaining variables are *Creditor Rights, Public Registry* and *Private Bureau*. I control for firm-level characteristic using the log of *Total Assets*, the log of *Equity*, the square root of *Fixed Assets*, the square root of *Leverage*, the square root of *Current* and *Ebit.* For macroeconomic environment, I use the log of *GDP growth*, *Initial GDP*, *Domestic Credit, Market Capitalization*, *Listed Companies* and *Taxes*. I also include *Inflation*, where observations below zero are dropped and the logarithm of the sine transformation is applied $LINFL = \ln(Inflation + \sqrt{Inflation^2 + 1})$. To prevent the independent and dependent variables to overlap, I use the mean of the covariates over the years 2000 and 2001. I employ cluster at the country-level to correct the variance.

For explaining the access to the bond market, I rely on the following logistic panel model:

$$\Pr\left(Bond_{it} = 1 \middle| \boldsymbol{f}_{it-1}, \boldsymbol{c}_{jt-1}, \boldsymbol{g}_j\right) = G(\alpha_{it} + \boldsymbol{f}_{it-1}\boldsymbol{\beta} + \boldsymbol{c}_{jt-1}\boldsymbol{\theta} + \boldsymbol{g}_j\boldsymbol{\gamma} + u_{ijt}) \quad (1)$$

where i=1, …, N identifies the firms in the sample, j=1,…,J corresponds to the countries and t=1,…., T is the time period (year). *Bond* is a dummy variable indicating if the firm *i* issue a bond (1) or not (0) on the year *t*.

α is a constant. $\boldsymbol{f}$ is a $1 \times k$ vector of *k* firm-level variables changing over time and $\boldsymbol{\beta}$ is the vector of the corresponding parameters. The variables included in $\boldsymbol{f}$ in the main model

are the same than for the cross-sectional analysis above. Note that I use the first lag of the firm-level variables to prevent an endogeneity issue with the funding choice realized on the year *t*. $\boldsymbol{c}$ is a $1 \times k$ vector of *k* country-level variables which are changing over time and $\boldsymbol{\theta}$ is the vector of the corresponding parameters. In the main model, $\boldsymbol{c}$ encompasses same variables than for the cross-sectional analysis. Dummy variables for the years are also included. Last, $\boldsymbol{g}$ is a $1 \times k$ vector of *k* country-level variables which are constant over time and $\boldsymbol{\gamma}$ is the vector of the corresponding parameters. In the main specification, this corresponds to *Creditor Rights*, *Public Registry* and *Private Bureau*. u is the disturbance term.

I estimate equation (1) with a logistic link G(.) and random-effects at the firm-level. I employ Mundlak's (1978) approach to insure that there is no significant covariance between the error term and the regressors. Variance is clustered at the firm-level.

Equation (1) emphasizes the multi-level nature of the dataset and the potential econometric flaws that can result. This feature is accommodates using hierarchical modeling in the robustness analysis. I employ random-effect intercepts at both the firm and country-level with nested random-effects for the years.

4. Results

This section presents the results. I first present the impact of creditors' protection and information on the access to the bond market, the amount issued and the maturity of the issuances. I then move on the role of firms' characteristics.

4.1. Access to the bond market

I first turn to the role of creditors' rights and information on the access to the bond market. The objective is to determine if a better protection and information of creditors ease the issue of bonds. Table 3 presents the results of the panel logit, displaying the odd-ratios. The dependent variable is *Bond* which equals to one each year the firm issues a bond.

Model 1 and 2 test the role of creditors' rights on the capacity of a firm to secure a bond issue. Model 1 uses only country-level variables while model 2 uses both country and firm variables. *Creditor Rights* turns to be significant in both estimations. An increase in the creditors' rights index strengthens the probability for a firm to go on the bond market. This effect fluctuates between 6.6% and 7.7% for an increase of 1 point of the index. It supports

the view that firms secure more easily a bond issue when the creditors are protected by the law. Hence, they can secure a more frequent access more to the bond market.

Model 3 and 4 look at the effects of creditors' information on the access to the market. It turns out that information is a key determinant of a bond issue. The variable *Public Registry* is highly significant in both specifications. The presence of a public registry in the country turns to be of specific importance: it increases the probability for a firm to issue a bond by 21.3% to 89.2% when the firms' characteristics are considered. Private agents offering a record of borrowings also exerts a positive effect, but only when firms' variables are in the model. The effect of *Private Bureau* remains substantial, since firms in countries with private records of borrowings increase the odds to use the bond market of 63.9%.

Last, model 5 and 6 incorporate creditors' rights and information levels within the same specification. When the model only integrates country-variables, both *Creditor Rights* and *Public* Registry remain positive and significant. However, when firms' variables are considered, creditors' information becomes the main determinant of the access to the bond market. *Creditor Rights* becomes non-significant while *Public Registry* and *Private Bureau* remain significant and exert a similar effect.

Overall, three results emerge. First, both creditors' rights and information favor the access to the bond market. Firms in countries with high level of creditors' protection and offering a public registry of borrowers' standing have more chances to secure a bond issue. Second, creditors' information is the main determinant of the access to the bond market. It turns out that informed creditors matters more than protected investors. When creditors know the risks they take, and can price it, they are ready to lend. Last, it should be noticed that the effects are sensitive to the inclusion or not of the firms' financial characteristics. This lends some weights to the hypothesis that the level of creditors' rights does not have an impact on the amount of bonds issued on all firms indistinctly. I offer further refinement thereafter to underpin this hypothesis.

4.2. Amount issued

Table 4 displays the impact of creditor rights and information on the amount of bond issued. The first and second specifications investigate the role of *Creditor Rights* on the amount of bonds issued. Again, while the first model only uses country-wide macroeconomic variables, the second model integrates firm-level variables. *Creditor Rights* is not significant when the specification does not include firm-level characteristics. On the opposite,

considering the role of the firm financial characteristics, the coefficient of *Creditor Rights* turns to be positive and significant. This effect is moderate since, on average, an increase of 1 point of the creditors' rights index leads to an increase of 2.9% of the ratio of the amount issued on total assets.

Turning to the role of creditors' information, the models 3 and 4 show a substantial role of *Public Registry* and *Private Bureau*. The effect is positive and significant either if the model includes firm-level variables or not. The increase in the amount issued when the public authorities offers a public registry of the firms' borrowings goes from 14.2% to 21.3%. In a similar way, having a private actor offering a database on the standing of the borrowers increases the amount issued from 7.2% to 9.5%. As underlined above, *Private Bureau* and *Public Registry* do not convey the same information and only 10 countries offer both registries. It turns out that providing creditors with information on the stranding of the borrowers strongly contributes to the use of the corporate bonds by firms. Furthermore, the effect is more than twice stronger when the provider of the record is a public authority.

Models 5 and 6 now consider both creditors' rights and information within the same specification. This helps determining which factor is the more important when taping the bond market. The results show that the effect of creditors' rights on the amount issued vanishes while the role of information is preserved. Either when considering only country-level variables or integrating firm-level characteristics, the effect of *Creditor Rights* becomes non-significant. On the contrary, *Public Registry* remains positive and significant in the two estimations, with similar values. *Private Bureau* is still significant in the model relying only country-level information but becomes non-significant when integrating firms' financial records. This gives support to the primary role of a public record of borrowing on the amount secured by firms on the bond market.

Overall, three results emerge, which are in line with the previous conclusions. First, the level of creditors' rights has a positive impact on the amount issued, but only when considering both country-level and firm-level variables. Second, the effect of creditors' information is major. Firms in countries offering a public or private record of standing of borrowing issue much more on the bond market. A public registry turns to play the most substantial role. Last, the more important factor is again creditors' information. The presence of credit registries outweigh the role of creditors information, up to render it non-significant.

4.3. Maturity

Table 5 presents the role of creditors' rights and information on the maturity issued on the corporate bond market. The models 1 and 2 estimate the role of *Creditor Rights*. Model 1 includes macroeconomic variables only while model 2 expands the specification with firm-level determinants. In either case, *Creditor Rights* exhibit a negative sign but fall short of being significant. It turns out that offering different level of protection to creditors does not affect the maturity of the bonds issued by the firms.

Turning to the role of asymmetries of information, a different picture emerges. Models 3 and 4 present the results, with model 3 considering only countries' variables while model 4 includes firms' variables. In either specification, the effect of *Public Registry* and *Private Bureau* on the maturity of the bonds is negative and significant. When the public authorities offer a record of issuers' debt, the mean maturity of the bonds issued falls by 5 to 6 months, with a stronger effect when the firms' financial characteristics are taken into account. Turning to the effect of *Private Bureau,* the effect is similar, with a drop by 6 months if the country has a private credit database. The negative relation between creditors' information and bonds' maturity gives support to the hypothesis that informed creditors are more reluctant to fund long-term debt.

Models 5 and 6 consider the role of creditors' right and information in the same specification. The main result is confirmed. While *Creditor Rights* remains non-significant, *Public Registry* and *Private Bureau* are negative and significant. The effect due to the presence of either a public or private credit registry in the country is stable, with a mean decrease by 6 months of the maturity.

4.4. Firms' agency costs and asymmetries of information

In this section, I investigate if the impact of creditors' rights and information on the bonds is affected by the firms' characteristics. I present successively the role of firms' agency costs and asymmetries of information on the results.

Table 6 presents the role of firm's agency costs on the relation between creditors' protection and the access to the market, the amount issued and the maturity. First, turning to the impact of firms' agency costs on the access to the bond market, both the tangibility of the assets and the level of cash do not have a significant impact. Conversely, the coefficients of *Public Registry* and *Private Bureau* remain positive and significant. Hence, the relation between creditors' rights and the access to the bond market seems to be uniform

across firms. Looking at the role of firms' agency costs on the amount issued, the interaction of *Free Cash-flows* with *Creditor Rights* is negative and significant. This lends some weight to the hypothesis that the role of creditors' rights is more beneficial to firms which already have low level of agency costs. This interpretation is supported by the effect of firms' agency costs on the maturity. When considering the role of assets' tangibility, the coefficient of *Creditor Rights* becomes positive. On the contrary, the coefficient of the interaction between *Fixed Assets* and *Creditor Rights* is negative. It is firms with higher fixed assets located in countries with higher creditors' rights which reduce the maturity of the bonds they issue. On the contrary, firms with more agency costs increase their maturity. This result is in line with Diamond (1991): firms of lower quality employ longer maturities while firms of better quality issue short-term debt.

Overall, firms' characteristics reinforce the effect of creditors' rights. Firms with lower agency costs benefit the most of higher creditors' protection, by accessing more easily the bond market, securing larger amount and issuing shorter bonds.

I now consider how firm's own level of private information affects the role of creditors' information on the bond market. Table 7 presents the results for the access to the bond market, the amount issued and the maturity.

For the access to the bond market, creditors' information benefits especially to firms which already have low level of information asymmetries. While the coefficient of *Listed* falls short of being significant, the history of the firm toward the bond market is of prime importance. While the number of previous issues has a negative impact on the probability of issuing a bond in general, it has a large and positive effect in countries with public or private credit registries. The interaction between *Previous Issues* and *Public Registry* and *Private Bureau* show that this effect is substantial. Converting the logarithm, previously issuing firms in countries with private bureau and public registry have respectively 7 to 8 times more chances to issue a bond than firm in countries without registries. On the meantime, the overall positive effects of *Public Registry* and *Private Bureau* are confirmed.

Turning to the impact of the firm's asymmetries of information on the amount issued, the estimations draw a similar picture. Being listed overall reduces the amount of straight bonds issued on the market, which is consistent with the firm having access to the equity and convertible market. However, in countries with a public registry or a private bureau, the impact is positive and significant, increasing the amount issued relative to the assets by 18.5% and 26.5% respectively. In the same way, having previously issued on the bond market has a

positive and significant effect on the amount issued only if the country has a public or private credit registry.

Last, the level of firm's information asymmetries also contributes reducing the maturity of the issues in countries offering a private bureau or public registry. The interaction between *Listed* and *Private Bureau* and the interaction between *Previous Issues* and *Public Bureau* are both negative and significant. Companies with more information issued shorter bonds when creditors' information is higher. This lends weight to the hypothesis that more informed creditors are less tempted to fund long-term bond, knowing the quality of the borrower.

Overall, the impact of creditors' rights and information is not uniform across firms. On the contrary, I find evidence of a *reinforcing* effect: firms with low level of agency costs and private information are the one which benefit the most of high level of creditors' rights and information. Nonetheless, apart from maturity, all the firms benefit of better creditors' standards in a country.

5. Robustness estimations

In this section I address two potential concerns. First, I offer an alternative estimation of the models, which takes into account the hierarchical structure of the data. Second, I give some robustness to the key variables used in the analysis, testing alternative components of legal environment.

Table 8 presents the estimation using a mixed-effect model. Mixed-effect regressions are useful when the hierarchical structure of the data can have an effect on the estimates (see for instance Molenberghs and Verbeke (2000)). It takes into consideration the nested aspect of the data by attributing random-effects at each level and modeling the covariance among the levels. For the cross-sectional regression of *Amount* and *Maturity*, I use an intercept random-effect for each country and apply the White's correction for the standard errors. For the panel logit regression of *Bond*, I use an intercept random-effect at the firm-level and at the country-level. I use slopes random-effects for the years.

The results are robust when the multi-level aspect of the data is taken into account. First, both *Public Registry* and *Private Bureau* remain positive and significant when the hierarchical aspect of the data is controlled for, confirming the primal role of creditors' information. Furthermore, the multi-level modeling substantially reduces the odds ratios.

When random-effects are attributed at the country-level the presence of a public registry of borrowers' standings increases by 12.1% the chances for a firm to issue a bond. Similarly, the presence of a private bureau increases this probability of 10.1%. This lower size of the effect stems from a highly significant variance of the country-level random-effects which take into account differences across countries. Turning to the amount issued, *Public Registry* still exerts a positive impact while the coefficient of *Creditor Rights* is non-significant. Last, information also reduces the maturity of the bonds with a negative and significant coefficient of *Private Bureau*. *Public Registry* turns to be slightly non-significant in this specification but it signs still indicates a negative impact on maturity.

Overall, using a multi-level modeling comforts the main results and helps considering further the differences across countries.

The second robustness test aims to underpin the identification of creditors' right and information in the analysis. While there is no substitute for the key variables used in this study (*Creditors' Rights*, *Public Registry* and *Private Bureau*), I test if alternative aspects of the legal environment does not hamper the results. For instance, the positive impact of *Public Registry* on the access to the bond market can stem from the legal system. La Porta et al. (1997) show that countries using French civil law have a more developed public sector combined with less developed financial markets. In that case, the positive impact of *Public Registry* can be due to the French legal system instead of the creditors' information. Similar reasoning applies to the other results. To consider the role of legal systems, I incorporate dummy variables for the English *Common Law*, the French *Civil Code*, the *German Law* and the *Scandinavian Law* (which is the base group).

Table 9 reports the results in the first three columns. Considering legal origin does not alter the main results. For the access to the bond market, incorporating the legal origin in the analysis does not affect the positive and significant effect of *Private Bureau* and *Public Registry* on the use of the corporate bond market. Turning to the amount issued, the coefficient of *Common Law* is positive and significant. Confirming previous results in the literature, firms in countries using the English common law issue a greater amount of bonds. However, this effect does not alter the main results. The coefficients of *Public Registry* and *Private Bureau* are positive and significant. Firms in countries with a public record of borrowings exhibit an increase of the ratio of the amount issued to their total assets of 28%. The effect of offering private registries of borrowers' standing is around 16.4%. Again, creditors' protection is not significant when information is considered. The main results are

also comforted for the maturity of the bonds. While the legal origin does not seem to impact the maturity of the bonds, *Private Bureau* and *Public Registry* remain negative and significant. Bonds issued in countries with a private or public record of credit still exhibit a decrease in their maturity by 6 months.

Besides of legal origin, the impacts of creditors' rights and information can also be a by-effect of the governance environment. The results would then not specifically stem from a better protection of creditors. To test this hypothesis, I redo the estimations incorporating World Bank variables for the governance environment. I use two indicators of governance related to creditors: *Control of Corruption* and *Rule of Law*. *Control of Corruption* takes into account the level of corruption in the country, with lowest values indicating high levels of corruption. The intensity of corruption can explain the role of creditors' information. *Rule of law* measures the application of the law in the country, notably in courts. As so, it can explain the role of creditors' rights.

The three last columns of table 9 present the estimations. The main results are comforted. While the firms in countries with low levels of corruption secure more easily a bond issue, creditors' information still exerts a distinct positive impact on the access to the bond market, with positive coefficients for *Public Registry* and *Private* Bureau. The presence of a public registry of credit also has a positive impact on the amount issued. Last, creditors' information still reduces the maturity of the bonds issued. Overall, considering the global governance environment does not alter the fundamental role of creditors' information on the use of the bond market by the firms.

6. Conclusion

This study has studied the role of creditors' rights and information on the issuance of bonds by firms incorporated in different countries. It provides two contributions. First, I investigate the impact of the legal environment on the characteristics of the bond market. Second I disentangle two channels through which the legal environment exerts a role on the corporate bonds: creditors' protection and information.

Using a firm-level approach, I measure the role of creditors' protection and information on the access to the market, the amount issued and the maturity of the issues. The results are robust across the estimations. When considered separately, both creditors' rights and information contribute to the access to the bond market. However, when considered

together, only creditors' information has a positive impact on the probability to issue a bond. The pattern is similar for the amount issued. While taken separately, both creditors' rights and information increase the amount secured on the bond market, the information factor turns to be the most important. Last, creditors' information exerts a negative impact on the maturity of the issues, supporting the hypothesis that informed creditors are less willing to engage in long-term lending.

I also investigate how the firms' own levels of agency costs and information asymmetries affect the impact of creditors' rights and information on the bonds issued. I find that a reinforcing instead of a smoothing effect. Firms with low level of agency costs and symmetries of information are the ones which benefit the most of high level of creditors' protection and information.

Last, robustness tests show that the core results are not altered by the multi-level nature of the data, the legal origin or the governance environment.

This study provides support for establishing strong creditors' information standards to promote the use of corporate bonds. It shows that country with weak creditors' rights and even corruption can still develop their bond market by offering records of borrowing to the lenders. In particular, it shows that the availability of a public registry of borrowers' credit history if of prime importance, whatever the legal tradition is. Substantial improvements in this direction can be achieved since only 10 countries in the sample offer a public registry. In the most conservative estimations, such a record increases the probability for a firm to secure a bond of 12% and the amount issued of 15%.

This study also paves the way for future research. Results show the importance of considering the firms' characteristics when assessing the role of legal environment. Not only it plays a role in estimating the impact of legal environment, but this impact is also not uniform across the firms. Future work could explore further the role how firms' characteristics challenges the results in the law and finance literature.

Table 1
Description of the sample

This table describe the sample, giving the number and the amount issued (M$) each year and across countries.

	Number of Issues	Amount (M)			
Years					
2002	3,234	372,840			
2003	3,408	457,714			
2004	3,632	378,515			
2005	3,274	406,207			
2006	3,548	558,161			
	Number of Issues	Amount (M)	*Creditor Rights*	*Public Registry*	*Private Bureau*
Countries					
Australia	138	24,502	3	0	1
Austria	81	7,995	3	1	1
Belgium	54	8,732	2	1	0
Brazil	122	22,675	1	1	1
Canada	737	76,514	1	0	1
Colombia	4	90	1	0	1
Denmark	24	5,930	0	0	1
Finland	90	10,619	3	1	1
France	726	205,867	3	0	1
Germany	610	134,032	2.3	1	1
Greece	1	12	1	0	1
Hong Kong	50	7,798	0	1	0
India	162	4,704	4	0	1
Indonesia	82	4,311	1	0	1
Ireland	3	2,250	4	0	1
Israel	3	703	2	1	0
Italy	103	42,251	2	0	0
Japan	1,742	210,199	1	0	1
Korea, Rep	2,043	122,894	3	0	1
Malaysia	2,585	47,912	2	1	1
Mexico	153	45,962	2.2	0	1
Netherlands	581	120,506	3	0	1
New Zealand	61	5,136	2	0	1
Norway	184	17,315	0	0	1
Pakistan	1	21	3	1	1
Peru	108	4,480	3	0	1
Philippines	23	2,817	2	0	1
Portugal	33	4,675	4	0	1
Singapore	127	7,825	1	1	1
South Africa	15	3,834	0	1	1
Spain	22	5,472	1	0	1
Sri Lanka	1	100	1	1	1
Sweden	169	9,992	3	0	1
Switzerland	63	6,937	1	0	1
Thailand	141	11,259	2	0	1
Turkey	1	13	2	1	1
United Kingdom	1,094	197,098	1	0	1
United States	4,959	790,007	3	0	1

Table 2
Description of the Variables

This table provides descriptive statistics for the variables used over the study. *Total Assets* and *Equity* are in thousands of US dollars. *Tangibility*, *Current, Ebit* and *FCF* are scaled by the tottal assets. Further definition of the variables is provided in the Appendix.

	N	Mean	Median	Sd	Minimum	Maximum
Creditor Rights	11,464	2.01	2.00	1.05	0	4
Public Registry	11,464	0.23	0	0.42	0	1
Private bureau	11,464	0.94	1	0.24	0	1
Total Assets	7,344	11,536	3,762	23,087	2	244,604
Equity	7,232	3,823	1,278	8,784	0	209,186
Leverage	7,310	0.33	0.32	0.17	0	3.77
Tangibility	7,293	0.42	0.40	0.23	0	1.64
Current	7,250	1.40	1.18	1.04	0.04	21.00
Ebit	7,315	0.07	0.06	0.06	-0.70	0.64
FCF	7,140	0.02	0.03	0.08	-1.47	0.64
Listed	11,464	0.58	1.00	0.49	0	1.00
Number of issues	11,464	1.09	0	3.85	0	88.00
GDP growth	11,464	3.27	2.93	1.92	-0.93	9.55
GDP per capita	11,464	2,995,166	47,614	6,708,786	1,114	23,900,000
Taxes	11,464	45.29	45.50	9.36	24.10	83.70
Inflation	11,464	87.71	87.70	7.74	43.15	100.70
Domestic Credit	11,464	135.72	136.80	48.66	14.52	197.71
Market Capitalization	11,431	100.41	100.70	58.03	10.16	886.11
Listed Companies	11,396	2,435	2,119	1,956	51	5,685
Common Law	11,464	0.54	1.00	0.50	0.00	1.00
Civil Law	11,464	0.13	0.00	0.34	0.00	1.00
German Law	11,464	0.29	0.00	0.45	0.00	1.00
Skandinavian Law	11,464	0.04	0.00	0.20	0.00	1.00
Control of Corruption	11,464	1.26	1.35	0.80	-1.13	2.53
Rule of Law	11,464	1.21	1.43	0.61	-0.97	1.99

Table 3
Access to the Bond Market

Panel logit regressions with random-effects at the firm-level. The dependent variable is *Bond* which takes one each year the firm issues a bond. Odd-ratios are reported. The t-statistic based on variances corrected for clustering is reported in parentheses. *, **, and *** denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively. Definitions of variables are provided in the Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)
Creditor Rights	1.066**	1.077**			1.056*	1.012
	(2.25)	(2.18)			(1.88)	(0.34)
Public Registry			1.213***	1.892***	1.183**	1.875***
			(2.67)	(6.44)	(2.28)	(6.17)
Private bureau			1.045	1.639***	1.019	1.622***
			(0.31)	(3.22)	(0.13)	(3.11)
Total Assets		1.189		1.177		1.179
		(0.91)		(0.86)		(0.87)
Equity		1.272		1.268		1.268
		(1.56)		(1.56)		(1.56)
Leverage		0.139***		0.140***		0.140***
		(-3.90)		(-3.86)		(-3.86)
Tangibility		2.860		3.078*		3.082*
		(1.59)		(1.68)		(1.68)
Current		0.241***		0.241***		0.242***
		(-5.99)		(-5.99)		(-5.98)
Ebit		4.997*		5.041*		5.045*
		(1.77)		(1.72)		(1.72)
GDP growth	1.033	1.074***	1.034*	1.080***	1.034*	1.080***
	(1.63)	(2.68)	(1.68)	(2.90)	(1.67)	(2.90)
Initial GDP (ln)	1.038**	1.018	1.059***	1.087***	1.054***	1.084***
	(2.45)	(1.03)	(3.29)	(4.33)	(2.99)	(4.09)
Taxes	0.992**	0.987***	0.990**	0.987***	0.991**	0.987***
	(-1.97)	(-2.80)	(-2.52)	(-3.03)	(-2.13)	(-2.97)
Inflation	3.155	4.262	4.663*	7.984**	3.960	7.724**
	(1.26)	(1.37)	(1.69)	(2.04)	(1.51)	(2.00)
Domestic Credit	0.018***	0.037***	0.017***	0.030***	0.017***	0.030***
	(-8.18)	(-5.09)	(-8.25)	(-5.24)	(-8.29)	(-5.25)
Market Capitalization	0.928	0.619**	0.902	0.585**	0.921	0.588**
	(-0.47)	(-2.21)	(-0.64)	(-2.47)	(-0.51)	(-2.45)
Listed Companies	0.764*	0.770	0.754*	0.747	0.755*	0.748
	(-1.71)	(-1.05)	(-1.80)	(-1.15)	(-1.78)	(-1.15)
Constant	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(-6.73)	(-8.34)	(-6.50)	(-8.24)	(-6.41)	(-8.24)
lnsig2u						
Constant	0.320***	0.031***	0.320***	0.003	0.318***	0.004
	(-8.30)	(-2.60)	(-8.31)	(-0.48)	(-8.31)	(-0.51)
N	11464	6922	11464	6922	11464	6922
Nb of groups	2367	1563	2367	1563	2367	1563
LL	-7445.32	-4322.20	-7444.64	-4301.73	-7442.85	-4301.67
LL Chi2	226.56	473.65	223.03	485.54	228.13	488.27
p	0.00	0.00	0.00	0.00	0.00	0.00
Min obs/gp	1	1	1	1	1	1
Max obs/gp	5	5	5	5	5	5
Avg obs/g	5	4	5	4	5	4
Panel-level sd	0.57	0.18	0.57	0.06	0.56	0.06
Rho	0.09	0.01	0.09	0.00	0.09	0.00

Table 4
Amount Issued

OLS regressions at the firm-level. The dependent variable is the amount issued over total assets, averaged from 2002 to 2006. Control variables are averaged over 2000 and 2001. The t-statistic based on variances corrected for clustering within countries is reported in parentheses. *, **, and *** denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively. Definitions of variables are provided in the Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)
Creditor Rights	0.001	0.029**			-0.008	0.010
	(0.11)	(2.39)			(-0.90)	(0.57)
Public Registry			0.142***	0.213***	0.145***	0.206**
			(3.84)	(2.77)	(4.02)	(2.60)
Private bureau			0.072**	0.095*	0.078**	0.086
			(2.38)	(1.84)	(2.51)	(1.56)
Total Assets		-0.031		-0.027		-0.027
		(-0.85)		(-0.84)		(-0.85)
Equity		-0.024		-0.021		-0.021
		(-0.81)		(-0.72)		(-0.72)
Leverage		-0.044		-0.044		-0.040
		(-0.31)		(-0.31)		(-0.28)
Tangibility		0.080		0.094		0.096
		(1.22)		(1.49)		(1.50)
Current		-0.014		-0.008		-0.006
		(-0.24)		(-0.15)		(-0.11)
Ebit		-0.179		-0.167		-0.166
		(-1.15)		(-1.17)		(-1.17)
GDP growth	0.015	0.018	0.003	0.015*	0.005	0.012
	(1.09)	(1.25)	(0.63)	(1.83)	(1.02)	(1.38)
Initial GDP	-0.014	-0.020*	0.001	-0.002	0.001	-0.002
	(-1.62)	(-1.85)	(0.27)	(-0.28)	(0.25)	(-0.34)
Taxes	-0.002*	0.001	-0.003***	-0.003*	-0.004***	-0.002
	(-1.74)	(0.41)	(-4.10)	(-1.71)	(-3.70)	(-1.38)
Inflation	0.057	0.146	0.081	0.184	0.078	0.193
	(0.52)	(0.99)	(1.13)	(1.25)	(1.11)	(1.35)
Domestic Credit	-0.000	0.003	-0.037	-0.020	-0.033	-0.027
	(-0.01)	(0.05)	(-1.07)	(-0.32)	(-0.99)	(-0.42)
Market Capitalization	-0.006	0.018	0.031	0.058	0.030	0.058
	(-0.23)	(0.53)	(1.37)	(1.50)	(1.41)	(1.51)
Listed Companies	-0.006	0.005	0.009	0.018	0.006	0.020
	(-0.35)	(0.27)	(0.83)	(0.90)	(0.58)	(1.01)
Constant	0.111	-0.209	-0.302	-0.770	-0.272	-0.823
	(0.24)	(-0.30)	(-1.05)	(-1.33)	(-0.95)	(-1.40)
N	2295	1376	2295	1376	2295	1376
Nb of groups	36	35	36	35	36	35
F	0.98	1.56	8.12***	4.74***	7.22***	5.15***
Adj. R^2	0.01	0.08	0.03	0.10	0.03	0.10

Table 5
Maturity of the Issues

OLS regressions at the firm-level. The dependent variable is the maturity of the issue in years (logarithm), weighted averaged from 2002 to 2006. Control variables are averaged over 2000 and 2001. The t-statistic based on variances corrected for clustering within countries is reported in parentheses. *, **, and *** denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively. Definitions of variables are provided in the Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)
Creditor Rights	-0.023	-0.085			0.034	-0.013
	(-0.26)	(-1.43)			(0.57)	(-0.24)
Public Registry			-0.808***	-0.658**	-0.824***	-0.647**
			(-3.02)	(-2.47)	(-3.23)	(-2.42)
Private bureau			-0.666**	-0.613**	-0.693**	-0.600**
			(-2.21)	(-2.18)	(-2.44)	(-2.19)
Total Assets		0.119		0.095		0.095
		(1.31)		(1.25)		(1.25)
Equity		-0.037		-0.033		-0.032
		(-0.52)		(-0.45)		(-0.45)
Leverage		-0.368*		-0.362		-0.367
		(-1.73)		(-1.60)		(-1.66)
Tangibility		0.601**		0.592***		0.588***
		(2.72)		(2.86)		(2.87)
Current		0.131		0.107		0.104
		(1.45)		(1.33)		(1.24)
Ebit		0.127		0.091		0.090
		(0.70)		(0.82)		(0.82)
GDP growth	-0.162*	-0.117**	-0.091*	-0.101**	-0.100*	-0.097**
	(-1.87)	(-2.17)	(-1.89)	(-2.52)	(-1.75)	(-2.14)
Initial GDP (ln)	-0.037	-0.033	-0.132**	-0.100**	-0.131**	-0.100**
	(-0.73)	(-0.94)	(-2.72)	(-2.59)	(-2.70)	(-2.61)
Taxes	0.005	-0.001	0.010	0.007	0.012	0.006
	(0.76)	(-0.14)	(1.51)	(0.99)	(1.66)	(0.84)
Inflation	-0.487	-0.829*	-0.546	-0.824	-0.536	-0.838
	(-0.91)	(-1.74)	(-0.98)	(-1.46)	(-0.96)	(-1.49)
Domestic Credit	-0.048	0.040	0.195	0.168	0.177	0.177
	(-0.17)	(0.18)	(0.89)	(0.79)	(0.77)	(0.80)
Market Capitalization	0.017	0.092	-0.219	-0.075	-0.217	-0.075
	(0.15)	(0.93)	(-1.22)	(-0.53)	(-1.23)	(-0.53)
Listed Companies	0.184**	0.141**	0.108**	0.105*	0.119*	0.101
	(2.07)	(2.21)	(2.09)	(1.72)	(1.92)	(1.59)
Constant	3.862*	4.360**	6.032**	5.884**	5.897**	5.956**
	(1.72)	(2.16)	(2.41)	(2.35)	(2.32)	(2.36)
N	2286	1368	2286	1368	2286	1368
Nb of groups	36	35	36	35	36	35
F	18.56***	66.86***	60.39***	106.88***	57.09***	122.20***
Adj. R^2	0.19	0.29	0.25	0.32	0.26	0.32

Table 6
Firms' Agency Costs

OLS and panel logit regressions at the firm-level. The dependent variable are *Bond*, *Amount* and *Maturity*. The t-statistic based on variances corrected for clustering is reported in parentheses. *, **, and *** denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively. Definitions of variables are provided in the Appendix.

	Access		Amount		Maturity	
	(1)	(2)	(3)	(4)	(5)	(6)
Creditor Rights	1.080	1.025	-0.056	0.016	0.301***	-0.005
	(0.92)	(0.64)	(-0.79)	(0.83)	(2.93)	(-0.09)
Public Registry	1.884***	1.901***	0.209**	0.198**	-0.662**	-0.643**
	(6.17)	(6.16)	(2.71)	(2.55)	(-2.65)	(-2.32)
Private bureau	1.596***	1.718***	0.108	0.078	-0.708**	-0.596**
	(2.96)	(3.37)	(1.63)	(1.41)	(-2.64)	(-2.10)
Tangibility	5.631**	3.297*	-0.071	0.094	1.383***	0.586***
	(1.99)	(1.76)	(-0.46)	(1.58)	(5.28)	(2.78)
Tangibility × Creditor Rights	0.762		0.106		-0.506***	
	(-1.08)		(1.06)		(-3.71)	
FCF		0.858		0.487		0.414
		(-0.12)		(1.46)		(0.93)
FCF × Creditor Rights		0.801		-0.213*		-0.259
		(-0.42)		(-1.74)		(-1.29)
Total Assets	1.180	1.258	-0.027	-0.027	0.094	0.097
	(0.87)	(1.18)	(-0.83)	(-0.87)	(1.22)	(1.25)
Equity	1.271	1.221	-0.022	-0.021	-0.028	-0.034
	(1.57)	(1.28)	(-0.75)	(-0.69)	(-0.39)	(-0.46)
Leverage	0.143***	0.118***	-0.046	-0.042	-0.336	-0.330
	(-3.82)	(-3.98)	(-0.33)	(-0.31)	(-1.55)	(-1.44)
Current	0.240***	0.268***	-0.004	-0.011	0.095	0.127
	(-6.00)	(-5.41)	(-0.08)	(-0.18)	(1.15)	(1.39)
Ebit	5.119*	5.594*	-0.176	-0.251	0.138	0.169
	(1.73)	(1.79)	(-1.25)	(-1.29)	(1.17)	(1.01)
GDP growth	1.087***	1.070**	0.009	0.013	-0.083*	-0.103**
	(3.07)	(2.50)	(1.12)	(1.40)	(-1.99)	(-2.21)
Initial GDP (ln)	1.086***	1.087***	-0.002	-0.003	-0.101***	-0.097**
	(4.17)	(4.17)	(-0.31)	(-0.42)	(-2.76)	(-2.53)
Taxes	0.987***	0.987***	-0.002	-0.002	0.007	0.007
	(-2.98)	(-2.86)	(-1.47)	(-1.07)	(0.95)	(0.97)
Inflation	7.733**	6.220*	0.198	0.178	-0.850	-1.033
	(2.00)	(1.69)	(1.42)	(1.22)	(-1.59)	(-1.69)
Domestic Credit	0.030***	0.026***	-0.038	-0.025	0.228	0.215
	(-5.25)	(-5.39)	(-0.62)	(-0.39)	(1.09)	(0.94)
Market Capitalization	0.590**	0.592**	0.058	0.057	-0.074	-0.066
	(-2.43)	(-2.39)	(1.57)	(1.47)	(-0.54)	(-0.45)
Listed Companies	0.739	0.717	0.023	0.020	0.090	0.089
	(-1.20)	(-1.31)	(1.18)	(1.01)	(1.49)	(1.35)
Constant	0.000***	0.000***	-0.711	-0.754	5.387**	6.705**
	(-8.26)	(-8.06)	(-1.29)	(-1.27)	(2.24)	(2.49)
N	6922	6768	1376	1349	1368	1341
Nb of groups	1563	1544	35	33	35	33
Adj. R^2			0.10	0.10	0.33	0.32
LL	-4300.54	-4199.07				
Chi2/F	485.82***	503.58***	5.16***	15.73***	102.27***	124.52***

Table 7
Firms' Information Asymmetries

OLS and panel logit regressions at the firm-level. The dependent variable are *Bond*, *Amount* and *Maturity*. The t-statistic based on variances corrected for clustering is reported in parentheses. *, **, and *** denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively. Definitions of variables are provided in the Appendix.

	Access		Amount		Maturity	
	(1)	(2)	(3)	(4)	(5)	(6)
Creditor Rights	1.012	0.949	0.011	0.017	-0.011	-0.032
	(0.35)	(-1.56)	(0.71)	(1.07)	(-0.20)	(-0.67)
Public Registry	1.939***	1.920***	0.030	-0.175	-0.634*	-0.012
	(2.94)	(4.12)	(0.58)	(-1.16)	(-2.01)	(-0.09)
Private bureau	0.721	2.003**	-0.169**	-0.257*	0.128	-0.199
	(-0.85)	(2.44)	(-2.31)	(-1.82)	(0.47)	(-0.65)
Listed	0.752		-0.220**		0.462	
	(-0.65)		(-2.66)		(1.16)	
Listed × Public Registry	1.104		0.185**		-0.002	
	(0.37)		(2.35)		(-0.01)	
Listed × Private Bureau	1.759		0.265***		-0.751**	
	(1.35)		(2.81)		(-2.05)	
Previous Issues		0.000***		-0.175		0.232
		(-11.51)		(-1.30)		(1.17)
Previous I. × Public Registry		24.327***		0.245*		-0.470***
		(10.20)		(1.76)		(-3.25)
Previous I. × Private Bureau		21.263***		0.260*		-0.282
		(4.72)		(1.92)		(-1.45)
Total Assets	1.192	1.566	-0.024	-0.042	0.084	0.100
	(0.92)	(1.60)	(-0.77)	(-1.57)	(1.15)	(1.49)
Equity	1.255	1.511*	-0.025	-0.030	-0.018	-0.014
	(1.46)	(1.84)	(-0.86)	(-1.07)	(-0.26)	(-0.22)
Leverage	0.132***	0.211**	-0.057	-0.151	-0.320	-0.246
	(-3.94)	(-2.41)	(-0.42)	(-1.29)	(-1.57)	(-1.08)
Tangibility	3.097*	2.079	0.106*	0.035	0.515***	0.678***
	(1.68)	(0.72)	(1.71)	(0.82)	(3.32)	(3.73)
Current	0.243***	0.277***	-0.008	0.018	0.117	0.088
	(-5.93)	(-4.39)	(-0.13)	(0.36)	(1.45)	(1.27)
Ebit	5.002*	0.763	-0.168	-0.171	0.116	0.063
	(1.70)	(-0.23)	(-1.18)	(-1.07)	(0.99)	(0.45)
GDP growth	1.077***	0.995	0.012	-0.004	-0.095**	-0.069
	(2.77)	(-0.12)	(1.45)	(-0.46)	(-2.14)	(-1.60)
Initial GDP (ln)	1.086***	1.035*	-0.004	-0.010	-0.095**	-0.099***
	(4.10)	(1.95)	(-0.60)	(-1.62)	(-2.50)	(-2.91)
Taxes	0.986***	0.995	-0.002	0.002	0.007	0.001
	(-3.05)	(-1.32)	(-1.37)	(0.84)	(0.92)	(0.12)
Inflation	12.525**	0.040*	0.205	-0.171	-0.811	-0.257
	(2.38)	(-1.90)	(1.37)	(-1.06)	(-1.50)	(-0.54)
Domestic Credit	0.032***	0.207	-0.028	0.064	0.181	0.062
	(-5.08)	(-1.63)	(-0.43)	(1.12)	(0.82)	(0.34)
Market Capitalization	0.585**	0.479**	0.055	0.031	-0.078	-0.044
	(-2.47)	(-2.20)	(1.49)	(1.25)	(-0.56)	(-0.40)
Listed Companies	0.742	1.066	0.023	0.001	0.092	0.133**
	(-1.17)	(0.18)	(1.16)	(0.06)	(1.50)	(2.66)
Constant	0.000***	0.004***	-0.641	1.336*	5.319**	2.712
	(-7.54)	(-2.73)	(-1.16)	(1.79)	(2.18)	(1.33)
N	6922	6768	1376	1370	1368	1368
Nb of groups	1563	1544	35	35	35	35
Adj. R^2			0.1	0.25	0.33	0.40
LL	-4294.80	-3113.57				
Chi2/F	514***	1073***	6.33***	176.18***	106.33***	145.38***

Table 8
Mixed-Effect Models

OLS and panel logit mixed-effects regressions. The dependent variable are *Bond*, *Amount* and *Maturity*. Random-effects at the firm-level, the country level and for years are estimated. The t-statistic based on robust variances is reported in parentheses. *, **, and *** denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively. Definitions of variables are provided in the Appendix.

	Access	Amount	Maturity
	(1)	(2)	(3)
Creditor Rights	1.013	0.011	-0.004
	(1.17)	(0.83)	(-0.06)
Public Registry	1.121***	0.157**	-0.336
	(3.84)	(1.96)	(-1.42)
Private Bureau	1.101**	0.060	-0.495**
	(2.24)	(1.13)	(-2.09)
Total Assets	1.040	-0.020	0.063
	(1.01)	(-0.62)	(0.97)
Equity	1.049	-0.025	-0.021
	(1.57)	(-0.83)	(-0.31)
Leverage	0.650***	-0.055	-0.260
	(-4.32)	(-0.39)	(-1.20)
Tangibility	1.211	0.076	0.603***
	(1.55)	(1.30)	(3.27)
Current	0.772***	-0.008	0.072
	(-7.19)	(-0.14)	(0.76)
Ebit	1.220	-0.191	0.212
	(1.39)	(-1.31)	(1.39)
GDP growth	1.017***	0.016	-0.056
	(3.18)	(1.60)	(-1.17)
Initial GDP (ln)	1.018***	-0.006	-0.060
	(2.77)	(-0.95)	(-1.62)
Taxes	0.998*	-0.002	0.006
	(-1.84)	(-1.42)	(1.03)
Inflation	1.665**	0.146	0.076
	(2.47)	(1.30)	(0.24)
Domestic Credit	0.521***	-0.034	0.165
	(-5.06)	(-0.67)	(1.10)
Market Capitalization	0.896***	0.045	-0.070
	(-2.73)	(1.25)	(-0.64)
Listed Companies	0.952	0.028	0.041
	(-1.01)	(1.60)	(0.78)
Constant	0.011***	-0.507	1.107
	(-5.74)	(-0.97)	(0.69)
RE - Firm	0.021***		
	(-7.57)		
RE - Country	0.038***	-2.991***	-1.321***
	(-9.48)	(-14.20)	(-8.04)
RE - Years	0.035***		
	(-4.13)		
N	6922	1376	1368
Nb of groups	1563	35	35

Table 9
Alternative Determinants

OLS and panel logit regressions at the firm-level. The dependent variable are *Bond*, *Amount* and *Maturity*. The t-statistic based on variances corrected for clustering is reported in parentheses. *, **, and *** denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively. Definitions of variables are provided in the Appendix.

	Legal Origin			Governance		
	Access	Amount	Maturity	Access	Amount	Maturity
	(1)	(2)	(3)	(4)	(5)	(6)
Creditor Rights	1.016	0.005	-0.009	0.946	0.014	-0.069
	(0.42)	(0.32)	(-0.15)	(-1.38)	(0.99)	(-1.06)
Public Registry	2.012***	0.280***	-0.688**	2.332***	0.123**	-0.288*
	(6.50)	(4.34)	(-2.25)	(6.43)	(2.10)	(-1.94)
Private bureau	1.626***	0.164***	-0.651*	2.104***	0.006	-0.360
	(2.99)	(2.79)	(-1.81)	(4.01)	(0.12)	(-1.63)
Common Law	0.839	0.187**	-0.181			
	(-0.70)	(2.28)	(-0.50)			
Civil Law	0.760	0.034	-0.061			
	(-1.55)	(0.50)	(-0.24)			
German Law	0.785	-0.034	-0.040			
	(-1.31)	(-0.67)	(-0.21)			
Control of Corruption				0.581*	0.081	0.210
				(-1.86)	(1.59)	(0.84)
Rule of Law				0.432	-0.186**	0.130
				(-1.45)	(-2.49)	(0.43)
Total Assets	1.176	-0.017	0.087	0.981	-0.016	0.058
	(0.86)	(-0.54)	(1.28)	(-0.09)	(-0.53)	(0.87)
Equity	1.270	-0.026	-0.028	1.478**	-0.031	-0.001
	(1.56)	(-0.86)	(-0.40)	(2.21)	(-1.00)	(-0.02)
Leverage	0.140***	-0.057	-0.355	0.113***	-0.057	-0.219
	(-3.87)	(-0.41)	(-1.67)	(-3.68)	(-0.41)	(-0.95)
Tangibility	2.995	0.070	0.605***	2.251	0.074	0.601***
	(1.64)	(1.21)	(3.01)	(1.09)	(1.26)	(3.12)
Current	0.240***	-0.013	0.107	0.218***	-0.004	0.100
	(-6.01)	(-0.22)	(1.18)	(-5.53)	(-0.06)	(1.06)
Ebit	5.041*	-0.196	0.123	9.469**	-0.193	0.233
	(1.74)	(-1.30)	(0.95)	(2.03)	(-1.35)	(1.68)
GDP growth	1.079***	0.007	-0.093**	1.039	0.028***	-0.083
	(2.85)	(1.00)	(-2.07)	(1.08)	(2.86)	(-1.45)
Initial GDP (ln)	1.095***	0.035**	-0.124*	1.101***	-0.011*	-0.060***
	(2.80)	(2.61)	(-1.71)	(3.47)	(-1.87)	(-2.93)
Taxes	0.987***	0.000	0.004	0.986**	-0.000	0.000
	(-2.69)	(0.08)	(0.50)	(-2.47)	(-0.08)	(0.05)
Inflation	7.315*	0.337**	-0.932	1.831	0.306*	-1.151**
	(1.94)	(2.51)	(-1.51)	(0.37)	(1.76)	(-2.33)
Domestic Credit	0.032***	-0.069	0.222	0.026***	0.041	0.075
	(-5.19)	(-0.99)	(0.93)	(-4.29)	(0.66)	(0.45)
Market Capitalization	0.574**	0.076*	-0.100	0.592*	0.040	-0.179
	(-2.55)	(2.03)	(-0.66)	(-1.65)	(1.04)	(-1.10)
Listed Companies	0.760	-0.008	0.127	0.769	0.020	0.152***
	(-1.08)	(-0.43)	(1.44)	(-0.77)	(1.14)	(3.58)
Constant	0.000***	-1.948***	6.694*	0.000***	-1.486**	7.230***
	(-7.65)	(-3.02)	(1.96)	(-6.71)	(-2.19)	(3.08)
N	6922	1376	1368	5581	1365	1358
Nb of groups	1563	35	35	1547	35	35
Adj. R^2		0.11	0.32		0.11	0.34
LL	-4300.27			-3520.81		
Chi2/F	503***	14.89***	224.69***	374.18***	23.02***	132.09***

Appendix
Variables Definition

Variable	Description	Source	Item
Creditor Rights	Index measuring creditors' rights at the country-level, ranging from 0 (lowest creditors' rights) to 4 (highest).	Djankov et al. (2007)	
Public Registry	Dummy variable equals to 1 if a public credit registry operates in the country and 0 otherwise	Djankov et al. (2007)	
Private bureau	Dummy variable equals to 1 if a private credit bureau operates in the country and 0 otherwise	Djankov et al. (2007)	
Total Assets	Total value of assets in US$.	Bloomberg Terminal	BS_TOT_ASSET
Equity	Total value of equity in US$.	Bloomberg Terminal	TOTAL_EQUITY
Leverage	Ratio of the total debt to the total assets.	Bloomberg Terminal	SHORT_AND_LONG_TERM_DEBT
Tangibility	Ratio of the net fixed assets to the total assets.	Bloomberg Terminal	BS_NET_FIX_ASSET
Current	Curent ratio.	Bloomberg Terminal	CUR_RATIO
Ebit	Ebit scaled by the total assets.	Bloomberg Terminal	EBIT
FCF	Free cash-flows to the firm, scaled by total assets.	Bloomberg Terminal	CF_FREE_CASH_FLOW
Listed	Dummy variable equals to one if the company is listed.	Bloomberg Terminal	
Number of issues	Number of bonds issued by the firm.	Bloomberg Terminal	
GDP growth	GDP growth, annual, %. Calculation is based on constant 2005 US$.	World Development Indicators (WDI)	NY.GDP.MKTP.KD.ZG
GDP per capita	Value of GDP per capita in constant LCU. Regressions use the initial value of this variable (*Initial GDP*).	WDI	NY.GDP.PCAP.KN
Taxes	The total tax rate as a share of commercial profits.	Doing Business, World Bank.	IC.TAX.TOTL.CP.ZS
Inflation	Annual variation of the consumer price index in %. Observations below -10% are dropped. In regressions, negative observations are set to zero and then apply the inverse hyperbolic sine transformation $LINFL = \ln(INFL + \sqrt{INFL^2 + 1})$	WDI	FP.CPI.TOTL
Domestic Credit	Domestic credit to private sector as a percentage of GDP.	WDI	FS.AST.PRVT.GD.ZS
Market Capitalization	Total market capitalization at the country-level.	WDI	CM.MKT.LCAP.CD
Listed Companies	Number of listed companies in the country.	WDI	CM.MKT.LDOM.NO
Common Law	Dummy variables equals to one if the country use the English common law and zero otherwise.	La Porta et al. (1998)	
Civil Law	Dummy variables equals to one if the country use the French civil code and zero otherwise.	La Porta et al. (1998)	
German Law	Dummy variables equals to one if the country use the German law and zero otherwise.	La Porta et al. (1998)	
Skandinavian Law	Dummy variables equals to one if the country use the Skandinavian law and zero otherwise.	La Porta et al. (1998)	
Control of Corruption	Perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption. Low values indicate high level of corruption.	Worldwide Governance Indicators, World Bank.	CC.EST
Rule of Law	Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	Worldwide Governance Indicators, World Bank.	RL.EST

Chapter Two

Do Shareholders Value Bond Offerings?

A Meta-Analysis

Abstract

Empirical literature finds contradicting results on the value shareholders give to a bond offering. To address this issue, this paper performs a meta-analysis on the stock reaction to bond offerings. I use a sample of 21,157 issues from 29 studies published between 1984 and December 2015. Overall, shareholders react positively to a bond issue. Heterogeneity in previous results can be explained by the length of the observation windows and the choice of the event date. Differences in the significance of the results are mainly due to the estimation length, the sample screening, the quality of the publication and the statistic used to test the significance of the abnormal returns.

JEL Codes: G3, G14.

Keywords: Meta-Analysis, Bond Issue, Stock Reaction.

1. Introduction

Corporate bond market has known a tremendous development during the last decade. In 2013, the amount issued reaches $3,000bn worldwide. The market is also diversifying, with $450bn issued in emerging market in 2013, up from $25bn in 2000 (Çelik, Demirtaş, and Isaksson, 2015). Accessing the bond market provides the firm with a large source of funding. It also diversifies its debt portfolio and its creditors, reducing its dependence on bank funding.

From 1984 onwards, empirical literature tries to determine the impact of issuing a bond for shareholders' value. However, results differ widely across studies and there is still no clear answer to this question. In this paper, I offer to build on this large literature and to estimate the impact of a bond offering on shareholders using a meta-analysis methodology. I also explain the differences across previous results using a multi-regression analysis.

Theoretical literature finds arguments underpinning both a positive and a negative impact of a bond offering on shareholders' value. On the positive side, issuing a debt may diminish agency costs by aligning the interests of shareholders and managers (Jensen and Meckling, 1976; Myers, 1977). Debt features also resolve asymmetric information and send an effective signal to investors about the quality of the firm (Myers, 1984; Jaffee and Stiglitz, 1989). Last, debt funding enhances the firm value by preventing liquidity risk (Diamond, 1991) and by generating tax benefits (Kane, Marcus, and McDonald, 1985). However, debt funding may also reduce shareholders' value. An excessive leverage exposes firms to bankruptcy risks which generates substantial costs for the firm (Gruber and Warner, 1977). Besides, Jensen (1986) underlines that straight debt may provide a large and undedicated amount of cash to the management. Hence, he predicts important agency costs if the use of the proceeds is not binding for the management.

To determine which effect is predominant, empirical studies mostly employ an event-study methodology. They compute the abnormal return of stock around the offering date and estimate its significance with statistical tests. The sign of the abnormal return then suggest the impact on shareholders' value. So far, literature does not reach a consensus and find contradicting results. Whereas some authors report an absence of reaction (*.e.g.* Mikkelson and Partch, 1986); Eckbo, 1986), others find a positive reaction (*e.g.* Dann and Mikkelson, 1984); Fungacova, Godlewski, and Weill, 2015) and some report a negative impact on shareholders' value (*e.g.* Cai and Lee, 2013; Chang et al., 2006).

I offer to settle this question and conciliate these diverging results through a meta-analysis. Meta-analysis is useful to obtain an overall effect across studies and to conclude on its significance. A multi-regression analysis helps explaining the heterogeneity in the previous results and disentangles between the impacts of factors such as sample selection, methodology, sample screening and level of publication on papers' results. It can then underline the role of each factor and provide recommendations for future research.

Close to this approach, Rahim, Goodacre, and Veld (2014) realized a meta-analysis on convertible bonds and warrants offerings. Instead, this study focuses on straight bond offerings. Straight bonds (hereafter, bonds) are substantially different from convertible bonds or warrants. They do not contain an equity feature but consist in pure debt instruments and the literature treats it separately from hybrid securities.

To conduct this meta-analysis-analysis I gather the results from all the papers performing an event-study on stock reaction to a bond issue. I reviewed all the published academic papers as well as working papers on bond offerings and found 29 papers reporting shareholders' reaction. The entire sample encompasses 21,157 bond issues. When computing the common effect across studies, the meta-analysis yields three results. First, shareholders' reaction to straight debt offering turns to be positive and significant. Second, there is no publication bias. Last, the reaction is not significant for shorter observation windows.

I explain heterogeneity across studies using a meta-regression analysis. Following Rahim, Goodacre, and Veld (2014), I both explain the level of abnormal returns and the t-statistic. Shareholders reaction is primarily impacted by the length of the observation windows and the choice of the event-date. Enlarging the length of the observation windows increases the abnormal return. Each supplementary day in the observation window increases the reported CAR up to 0.27%. Choosing the announcement date instead of the issue date to investigate shareholders' reaction increases the reported CAR from 0.49% to 0.71%. I also find some evidence for a higher reaction in emerging markets and a negative impact of debt IPOs. On the opposite, there is no evidence that shareholders' reaction is different across regions.

The reported t-statistic appears to be impacted by some different factors. First, the level of the t-statistic is strongly impacted by the sample selection and screening. Sample on emerging market tend to display significantly lower t-statistic. A careful screen of contemporaneous events and the securities included also has a significant impact on the t-statistics. Second, studies published in top-ranked journals report higher t-statistic. Last, the different way to test the significance of abnormal returns strongly impact the reported t-

statistic. Studies using the variance within the observation windows display significantly higher t-statistics.

The results yield important implications for the literature on security issues. First, it provides an answer to the stock reaction to bond offerings, based on current literature. Second, it emphasizes the critical role of methodology in event-study analysis and its impacts on results. As so, it supports a large use of robustness analysis, controlling notably for the windows of the event, the screening process and the variance used to construct statistical tests.

The remainder of the paper is organized as follows: section 2 details and discusses the factors impacting shareholders' reaction. Section 3 describes the sample selection. Methodology and model of the meta-analysis are presented in section 4. Section 5 presents and analyses the results. Section 6 concludes.

2. Theoretical Debate

Literature provides different predictions on the impact of a bond offering for shareholders. Contradicting arguments support either a positive or a negative stock reaction. In this part, I summarize the main theories.

2.1. Arguments for a Positive Reaction

A positive impact of a debt offering for the shareholders can stem from the resolution of asymmetries of information, the alignment of the interests of management and shareholders and the tax-shield impact of interest payments.

First, a bond issue reduces the asymmetries of information between managers and shareholders by signalling the quality of the firm. Myers and Majluf's (1984) model show that a firm prefers to issue debt than equity to finance valuable investments in the context of information asymmetries. To choose to issue a bond then signals valuable investments. A similar result is found by Stein (1992). In his model, firms with riskless projects will issue straight bond instead of convertible bond or equity. Since the shareholders know that the firm can choose between several sources of funding, the issue of straight bond signals good-quality firms and yields a positive stock reaction.

Second, a bond issue aligns the interests of managers and shareholders and reduces the agency costs of the firm. Seminal work of Jensen and Meckling (1976) underlines that the interests of management and shareholders are not aligned, a priori. Both pursue different

objectives and the management is not necessarily focused on the maximization of shareholders' wealth. The issue of debt then creates a constraint for the management, since a bankruptcy also threatens its position in the firm. The management has to generate enough profits to pay regular coupons and refund the notional, an objective which is in line with the maximization of firms' value for the shareholders. Hence, a debt offering somehow disciplines the behaviour of the management, aligning its interest with those of shareholders. Doing so, it reduces the agency cost for shareholders. A bond issue should then be positively perceived by shareholders and associated with a positive stock market reaction.

A bond issue may also reduce excessive cash-flows in the hand of the management. Entrenched management can withhold cash-flows and not distribute it to shareholders. This is an issue because entrenched management are more likely to misuse cash-flows in non-profitable projects for the firms, serving their own interest. In this context, Jensen (1986) demonstrates the positive role of debt. The regular payment of interests substitutes to dividend and prevents the retention of free cash-flows. It leads management to invest only in project with a positive net value and greater the value of the firm. In this case, a bond offering is expected to generate a positive reaction from shareholders.

Last, debt represents a tax benefit for shareholders as it decreases corporate tax for the firm. This positive effect has been theorised by Modigliani and Miller (1963) and Kane, Marcus, and McDonald (1985), who show that profitable firms have an interest to use debt as long as their revenue is positive. Hence, shareholders may react positively to a bond issuance because of the tax benefits of debt funding.

2.2. Arguments for a Negative Reaction

The literature also underlines the cost associated with debt funding. These costs can hamper shareholders' value and lead to a negative reaction to a bond issue.

By resolving some asymmetries of information, the use of debt is not always some good news for shareholders. This approach is in the root of Miller and Rock's (1985) model to explain investors' reaction further to a security offering. In his model, the use of debt funding may signal a funding gap, stemming from unprofitable investments. Whereas the management was aware of the losses for the company, the shareholders eventually learn it when the firm issue a bond to refund itself. In this context, issuing a bond may signals a funding gap due to bad investment decisions and may lead to a negative stock reaction.

Second, a bond issue may also reinforce the entrenchment of management. Jensen (1986) underlines that a bond issue can provide the management with a large and undedicated amount of cash. Without a binding use of the proceeds, the management may misuse this cash in unprofitable projects or tunnel it out of the firm. In this case, issuing a bond generates important agency costs by reinforcing management entrenchment and exacerbating its moral hazard. Hence, bond issuance for general purposes or an unclear use may hamper shareholders' value and lead to a negative stock reaction.

Last, issuing a bond may also excessively increase the leverage of the firm. An excessive leverage increases the probability of default of the firm and the costs associated with bankruptcy. The role of bankruptcy costs on the present firm value has been underlined by Gruber and Warner (1977) who distinguished both direct and indirect costs. Hence, a bond issue which leads to an excessive leverage increases the present value of bankruptcy costs. It then hampers the value of the firms for shareholders and is expected to lead to a negative stock reaction.

3. Meta-Analysis Data

Empirical literature finds opposing results on the impact of a bond offering on shareholders' value. To estimate an overall effect and explain the heterogeneity across studies, I review the literature using a meta-analysis methodology. I use Google Scholar, the Social Sciences Research Network and library catalogues (JStor, Elsevier, Taylor & Francis, etc.) to gather all the studies available on shareholders' reaction to straight bond offering[3]. I conduct the survey until the end of 2015. As recommended by Stanley et al. (2013), I perform a double-check of the data. I first collect it from June to September 2015 and then check every study again on November 2015. I updated the dataset on July 2016 to include all the papers published at the end of 2015.

I only include papers written in English, in academic journals or unpublished working papers. Papers in academic journal were published from 1984 to 2015 and there is one working paper in 1998 and three in 2015. As the study is on public debt offering, I remove studies and samples of private debt offerings. Last, papers should present at least the number

[3] The following keywords have been used, alone and in interaction: "stock reaction", "shareholder reaction", "bond offering", "bond issue", "straight debt offering/issue", "public debt offering/issue", "debt offering/issue", event-study debt/bond/straight debt issue/offering", "initial public debt/bond offering/issue".

of observations in order to be used in the meta-analysis. This requirement removes one paper from the sample[4].

Table 1 presents and summarize the sample. Dann and Mikkelson (1984) first investigated shareholders' reaction around an announcement of public straight debt issuance. Since then, several studies have dug deeper this subject by enlarging the sample, screening other countries and assessing the impact of issuance and issuer characteristics. I find 15 papers published before 2000 and 14 from 2000 onwards. The interest of the literature for this subject appears to be relatively stable. One notable evolution is the use of wider observation windows since 2004 and the interest for other countries than the USA. There is however no clear differences in the results across the years.

Overall, results vary largely across the papers. 26 samples report a positive mean reaction gathering a total of 14,811 issuances whereas 15 samples report a negative mean, with 5,845 issuances. However, the mean CAR is not significant in 26 samples. It is therefore difficult to conclude to the overall impact of a bond issue.

Three-quarter of the studies are conducted in the USA without conclusive results: whereas 14 studies find a negative stock reaction, 17 conclude to a positive effect and among them 11 are significant. Four studies are focusing on Europe and find again contrasted results: two samples conclude to a positive wealth effect and two others find non-significant results. Last, a recent trend of literature is focusing on emerging markets and results are as unclear. Five samples conclude to a non-significant stock reaction whereas Klein and Weill (2015) conclude to a reaction significant and positive in China and Edirisinghe and Nimal (2015) to a reaction significant and negative in Sri Lanka.

Overall, table 1 underlines that the literature has so far mixed results concerning the reaction of shareholders around a public debt issuance. Moreover, a quick summary of the literate shows that the geographical repartition of the studies fall short of explaining the variance in the results. The meta-analysis can give an overall effect and disentangle the impacts of studies characteristics on these results.

[4] Ashhari, Chun, and Nassir (2009) do not report the number of observations. I kindly requested the information from the authors but get no return.

4. Methodology

In this section, I first present the estimate of shareholders' reaction from the underlying sample, i.e. the effect size. I then present papers' specificities which can explain the heterogeneity across results. Last, I detail the meta-regression model.

4.1. Estimation of the Effect Size

To conduct the meta-analysis, I compute a common effect from the underlying studies. I follow Rahim, Goodacre, and Veld (2014) and use a replication analysis. The mean cumulative abnormal return (CAR) of each sample is considered as an observation and aggregate to obtain an average CAR. Studies often report several subsamples and different windows. Two rules apply to select CARs.

Concerning the use of subsamples in papers, CARs from the whole sample are selected if the paper presents it. For instance, Shyam-Sunder (1991) reports an overall CAR and then divides it according to issuance grade. Because the main sample relies on a larger sample and the subdivisions are different for each paper, the overall sample is more comparable to the results from other studies. Moreover, taking subsamples increase the risk of correlation between samples. Last, papers which present a main sample and its subdivisions usually made subdivisions on several criteria with overlapping observations. Taking these subsamples would lead to count several times a same observation. However, for papers which present results for non-overlapping subsamples only, I collect these results as different observations.

Second, papers use different event windows. Whereas some authors focus on the day of the event solely, others include the days before and after the event. To obtain an overall effect, I aggregate the CAR of different windows. However, authors usually report several windows in their studies. To select the windows, I follow the approach of Doucouliagos and Stanley (2009) and select the best-set estimates. First, I retain the window used in the regression of CARs. The rationale is that authors consider this window to be the more accurate for their sample. Second, if the paper uses several windows in the regression or does not perform any regression, I select the shortest window. The reason is that shorter event-

windows are less likely to be polluted by the announcement of other events or by correlated returns across issuances. This computation corresponds to the main estimate, Main CAR[5].

As a robustness test, I use an alternative computation of CAR by selecting the shortest observation windows in each study, which corresponds to the estimate Short CAR. This computation checks if the results are not lead by the rules of selection of CARs or by wide observation windows. Last, CARs on the different windows reported by the authors are also presented. Significance of CARs is tested with a cross-sectional test of student. To take into account the possible skewness of the observations, a non-parametric test of the median is also undertaken. The t-statistics of the studies is also presented. This t-statistic tests the significance of CARs, i.e. if it equals zero. I report the t-statistic of the Main CAR (Main t) and the Short CAR (Short t). Usually, papers report the t-statistic. For papers which only report the p-value, the corresponding two-tailed t-statistic is computed. Few papers only report the threshold of significance (i.e. non-significant, 10%, 5% or 1%). In this case, I follow Cooper (1989) and postulate a t-statistic corresponding to the level of significance and for papers only reporting "non-significant", a p-value of 0.5 is postulated.

Main Car and Short CAR are unweighted CARs which do not take into account the precision of each study. Standard meta-analysis methodology requires calculating either a fixed or a random-effect indicator of the effect-size across studies (Hedges and Vevea, 1998). Fixed or random-effect indicator weighted each observation by its precision, using the within study variance. Hence, computing such an indicator requires deducing the variance within each study from the reported t-statistic.

However, one should be very careful when using the t-statistic from different event-studies. Event-study literature uses three main statistics to determine the significance of CARs. Some papers use a Patell's (1976) statistic which only considers the variance on the estimation period. Others use the cross-sectional variance on the observation period to take into account that the issuance may generate a specific volatility of stocks. Last, some papers use Boehmer, Masumeci, and Poulsen's (1991) statistic which takes into account both the variance within the estimation and observation periods.

In each case, the variance of the sample is computed differently. If the way to compute the variance impacts the level of the t-statistic, it cannot be used as an indicator of precision

[5] Only in Edirisinghe and Nimal (2015) several windows and models are presented without the authors electing one in a specific way. In this sole case we selected the (-1,0) window of the modified model. I checked the sensibility of this choice and it does not affect the results

across studies. To settle this issue, I determine the relation between the t-statistic and the computation of the variance with an OLS regression. Three indicators are generated: BMP Stat takes one if the paper uses Boehmer, Masumeci, and Poulsen's (1991) statistics and zero otherwise. OW Stat takes one if the paper uses a cross-sectional statistic over the observation windows and zero otherwise. Last, EW Stat is a dummy variable taking one if the variance of the statistic is computed with the variance on the estimation windows. The following regression is then realized:

$$t_i = \alpha + \beta_{BMP}\text{BMPStat} + \beta_{CS}\text{OWStat} + \varepsilon_i \quad (1)$$

$t_i$is alternatively the t of Main CAR and Short CAR. EW Stat is the omitted category. If the level of the t-statistics depends on the type of computation, significant coefficients should be observed. Columns 1 and 2 of table 2 reports the results.

The coefficient of BMP Stat is significant. Hence, the level of t-statistic is significantly determined by the method of computation and the variance within studies cannot be used as an indicator of precision. This result is confirmed later in the multi-regression analysis. Alternatively, I follow Allouche and Laroche (2005) and weight each CAR by the number of observations. The rationale is that larger the sample is, more accurate the results are. This corresponds to the estimate Weighted CAR:

$$\text{Weighted CAR}_i = \text{MainCAR}_i \times \frac{n_i}{N} \quad (2)$$

With n_i the number of observations in the ith sample and N the total number of observation across samples.

Another important issue in meta-analysis is the publication bias. Publication bias occurs when non-expected results prevent publication or prevent researchers to make their work public. Hence, publication bias can occur either for journal as for working papers. Publication bias may bias the meta-analysis by altering the true population effect. Two techniques are used to test the presence of publication bias.

First, I employ a funnel graph which compares effect size and the precision of the study. A funnel graph compares the effect-size (the CARs) to an indicator of precision of each study. Since the within-study variance depends on the t-statistic reported, the approach of Allouche and Laroche (2005) is followed with the sample size as the indicator of precision. Without publication bias, the CARs should scatter symmetrically around the mean and larger studies should converge to the mean.

The interpretation of the funnel graph is completed by performing a Funnel Asymmetry Test (FAT). I follow Stanley (2008) and regress the t-statistic (of Main and Short

CAR) on the reverse of the standard error of the study (se_i), adding = BMP Stat OW Stats to control for the variance computation. A non-significant intercept α indicates an absence of publication bias (Egger et al., 1997):

$$t_i = \alpha + \beta_1 . \frac{1}{se_i} + \beta_2 \text{BMPStat} + \beta_3 \text{OWStat} \quad (3)$$

4.2. Sources of Heterogeneity

One of the key contributions of the meta-analysis methodology is to explain the heterogeneity in the results of the studies by the specific features of these studies. Five sources of heterogeneity which potentially explain the variance of the stock reaction across the papers are investigated.

4.2.1. Sectorial Effects

Some papers restrict the sectors integrated in the study. First, some papers exclude the financial sector of the analysis, arguing of strong differences with the other sectors. To investigate the impact of the inclusion of the financial sector in the analysis, we generate a dummy variable Financials taking one if the sample includes financial companies and zero otherwise. Table 3 present the variables. Only 17 samples integrate financial companies in their analysis, representing 35% of all issuances.

Some papers also focus exclusively on the industrial sector. To distinguish them a dummy variable Industrial taking one if the sample includes industrial firms only and zero otherwise is generated. Industrial catches the differential wealth effect when the sample includes only industrial firms. This represents 5% of the issuances.

4.2.2. Country of Issuance

Differences in countries and governance system may impact shareholders' reaction (La Porta et al., 2000). Moerland (1995) distinguish network and market oriented economies and its impact on securities issuance. Johnson et al. (2000) show that pyramidal ownership structure in emerging countries exerts a negative impact on shareholders through fears of tunnelling. To investigate the role of different governance systems across countries, I isolate issues that take place in emerging countries. Emerging takes one if the issuance takes place in

an emerging country and zero otherwise[6]. Results may also be led by specific features of the US market, which encompasses the majority of observations. To determine the impact of US studies, I generate a dummy variable USA which takes one if the issuance takes place in the US and zero otherwise. Last, Europe is a dummy variable taking one if the issuance takes place in Europe and zero otherwise.

Analysis of shareholders' reaction further to a straight debt offering is mainly performed in the US. 31 out of 41 samples scrutinize US stock markets, gathering 77% of all observations. On the contrary, only 4 samples focus on Eurobonds with 18% of the observations. Recently, seven papers have investigated shareholders' reaction in emerging countries. This represents 7% of the observations.

4.2.3. The Choice of the Announcement or the Issue Date

The objective of event-studies is to capture the impact of new information on shareholders' wealth. Theoretically, the information is fully integrated in shareholders' expectation at its disclosure (Fama et al., 1969). Most of the papers consider the first announcement of the issuance as the event day. However, some papers focus on the issue date instead. Alternative arguments justify this choice.

First, papers focusing on the announcement date argue that shareholders fully integrate the impact of the issuance as its disclosure. Yet, the issuance is not certain from the first announcement. Indeed, some issuances are eventually cancelled and Mikkelson and Partch (1986) show that the abnormal returns are impacted by the cancellation or confirmation of issuance. Overall, Eckbo (1986) shows that abnormal returns are different all along the issuance process, from the announcement to the effective issuance. Hence, different abnormal returns can be captured depending on the event day selected by the authors.

To estimate the impact of the event day on the shareholders' reaction I use a dummy variable Issuance which takes one if the event is the issuance day and zero if the event is the announcement day. Only four samples gathering 5% of the observations focus on the day of issuance instead of the announcement day.

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[6] I follow the authors' classification of countries at the time they write the paper. Papers focusing on emerging markets encompass the following countries: Argentina, Bahrein, Brazil, Chile, China, the Czech Republic, Hong Kong, Indonesia, Indonesia, Israel, Malaysia, Pakistan, Peru, the Philippines, Portugal, Qatar, Singapore, South Africa, South Korea, Sri Lanka, Taiwan, Thailand, and Turkey.

4.2.4. Computation of Abnormal Returns

Event-studies use alternative methodologies (MacKinlay, 1997). Four methodological choices may impact the results. First, papers use alternative computation of abnormal returns (ARs) to estimate shareholders' reaction. A large part of them use a market-model, where the expected return of the firm n is obtained by regressing firm's return on a market index m:

$$E[R_{n,t}] = \alpha_n + \beta_n . R_{m,t} \quad (4)$$

Other studies employ a modified-model to compute the expected return. The rationale is that the beta in a market-model may be polluted by other events occurring during the estimation period (Brown and Warner, 1980). In this case, the expected return is computed such as:

$$E[R_{n,t}] = R_{m,t} \quad (5)$$

This difference of expected return may impact overall results. To assess the role of this methodological issue I compute a dummy variable Market Model, which takes one if the paper uses a market-model. In the literature 31 samples over 41 use a market model to compute abnormal return. However, this represents only 41% of the observations.

A second methodological choice differing across papers using a market-model is the length of the estimation period. There are no clear guidelines about how long the estimation period should be to get a correct estimation of the expected return. Whereas Godlewski, Turk-Ariss, and Weill (2013) use a 90 days estimation period, Howton, Howton, and Perfect (1998) use 301 days. The choice of the length of the estimation period is a trade-off. Betas may not be accurate if they do not get rid of market fluctuations through a long estimation period. On the contrary, a too long estimation period may generate out-dated parameters.

Hence, it is unclear how this methodological issue impacts papers' results. The variable Estimation Length corresponds to the number of days of the estimation period. Panel B of table 3 presents this variable for papers using the market model. The sample presents an important heterogeneity in the length of the estimation windows, with a mean of 169 days but a standard deviation of 73 days.

Third, papers also use different observation windows to capture abnormal returns. The first strand of literature from 1984 to 1996 mainly uses a (-1,0) windows which correspond to the cumulated abnormal returns of one day before the issuance and the day of issuance. The idea is that shareholders may anticipate the issuance through rumours or leakages and integrate the information one day in advance. However, more recent papers usually extend the

observation period to 3 to 5 days around the event, arguing that market may anticipate sooner the issuance and take one or two days more to fully integrate the impacts on the firm.

To consider the role of this methodological choice, I use a variable Observation Length which counts the number of days within the observation windows. The mean length for Main CAR is 3 days, with some papers with some papers using up to 7 days in their main analysis.

4.2.5. Sample Screening

Papers use alternative criteria to screen their samples. First, some papers explicitly check if the event does not coincide with another financial event and remove the observations otherwise. This precaution is essential to isolate shareholders' reaction to debt issue. For example, some papers screen carefully if there is no dividend announcement, management turnover or equity issue the day of the event. On the contrary, some papers do not report this screening. Hence, there is a risk that abnormal returns for these studies encompass other events than public straight debt offering.

The dummy variable Confounding takes one if the paper states that there is no other financial event around the straight debt offering. Confounding takes zero if this statement is not made by authors. This precaution is not followed in 18 samples which account for 59% of all observations.

Second, not all papers explicitly state that they are focusing on straight debt. Some papers only report "debt offering" or "bond" issuance. The variable Straight Debt takes one if the paper explicitly states that debt offerings in the sample are straight debt offerings. If the paper does not provide this statement, Straight Debt takes zero. Only 21 samples clearly state that issuances are "straight debt".

Third, not all papers state clearly that the sample is composed of public debt. Whereas studies explicitly focusing on private offerings have been removed from the analysis, some authors remain vague about the public status of the offerings in their sample. To see how this may impact the results, I use a dummy variable Public Debt which takes one if the paper explicitly states that the sample is composed of public offerings only. Only 14 samples are explicitly defined as "public" offerings by the authors.

Last, Datta, Iskandar-Datta, and Patel (2000) shows that debt IPOs exhibit a different shareholders' reaction than seasoned debt offering. However, apart from studies focusing on the debt IPO issue, none of the other studies explicitly state that they remove debt IPOs from

their sample. To investigate the extent of which this sample specification impact the results, I employ a dummy variable IPO which takes one if the samples include debt IPOs only, and zero otherwise. 3 samples focus on IPO solely but representing 8% of all issuances. The coefficient of IPO determine if mixing both IPOs and seasoned debt offering impact the results.

4.2.6. Publication Heterogeneity

Some of the studies used in the meta-analysis are unpublished working papers whereas others are published in high-ranked journal. Different quality of papers may have an impact on results.

Following previous meta-analysis methodology (e.g. Rahim, Goodacre, and Veld, 2014; Veld and Veld-Merkoulova, 2009) I introduce a variable to take into account this dispersion. Namely, we identify studies published in one of the top 3 journal in Finance: The Journal of Finance, the Journal of Financial Economics and the Review of Financial Studies. Top3 takes one if the study is published in one of these papers and zero otherwise. Fourteen samples out of 41 come from papers published in one of the top 3 journals in finance. However, these papers only gather 11% of the observations.

4.2.7. Significance of Abnormal Returns

Papers use different computations of t-statistic to evaluate significance of abnormal returns. Estimating the impact of using one or another statistic test to assess abnormal returns significance is of key interest. Some papers may conclude to significant or non-significant results because of the statistic they use. To appraise the impact of this methodological issue in I use the BMP Stat, OW Stat and EW Stat variables described below. Only four samples use the BMP statistic, whereas 21 use a statistic relying on the observation windows and 16 on the estimation windows.

4.3 Meta-Regression Model

To consider the impacts of each variable on the CARs, I implement a meta-regression analysis (MRA) model following notably Wang and Shailer (2015). The CAR of each sample is the dependent variable and the variables introduced above are used to explain the heterogeneity across the CARs. I first present a weighted least square (WLS) regression which takes into account the different precision of studies, using the number of observations

in each sample. The rationale is to give higher weight to more precise studies. I also present unweighted models which display lower risks of multi-collinearity.

The general regression model is as follows:

$$\overline{\mathrm{CAR}}_{\mathrm{i}} = \alpha + \beta_1 \times \mathrm{Industrials} + \beta_2 \times \mathrm{Financials} + \beta_3 \times \mathrm{Emerging} + \beta_4 \times \mathrm{USA} + \beta_5 \times \mathrm{Issuance} + \beta_6 \times \mathrm{Market\ Model} + \beta_7 \times \mathrm{Estimation\ Length} + \beta_8 \times \mathrm{Observation\ length} + \beta_9 \times \mathrm{Clean} + \beta_{10} \times \mathrm{Straight\ Debt} + \beta_{11} \times \mathrm{Public\ Debt} + \beta_{12} \times \mathrm{IPO} + \beta_{13} \times \mathrm{Top3}$$

$\overline{\mathrm{CAR}}_{\mathrm{i}}$ is the Main CAR as reported in studies. I also report an alternative regression with Short CAR as dependent variable.

Following Rahim, Goodacre, and Veld (2014) I employ the t-statistic as an alternative measure of the effect size. For the regression of the t-statistic, I add two variables: BMP Stat and OW Stat which investigate the impact of the computation of the variance. The omitted group is EW Stat.

One main issue in MRA is the use of samples from the same study which can lead to correlated observations, yielding invalid test statistics and inferences. Two approaches are used to resolve this issue. Following Wang and Shailer (2015) I use robust standard errors, clustered at the study level. Following Rahim, Goodacre, and Veld (2014), I compute a weighted least square model where the weights correspond to the reverse of the number of samples in each study.

5. Results of the Meta-Analysis

This section first presents the overall stock reaction to a bond issue and then the results of the multi-regression analysis.

5.1. Stock Reaction to a Bond Issue

Table 4 presents the univariate results. . Shareholders' reaction ranges from -0.86% to 2.88%. The mean turns to be positive and significant at the 10% level with a p-value of 0.056: overall, a straight bond issuance is associated with a positive abnormal return of 0.22%. The significance of the mean is somehow qualified by a non-significant median, with a distribution positively skewed.

This first estimate does not take into account the different of precision between studies. Whereas some samples are based on thousands of issues, others rely on some dozens

(for instance, Edirisinghe and Nimal (2015) use 20 issues). To prevent less precise samples to lead our estimate, I now consider the results for CARs weighted by the number of observations. The Weighted CAR confirms the main result, namely, shareholders' reaction to straight debt offering is positive and significant. Again, the median turns to be non-significant, with a positive skewness.

I now consider the impact of the window of observation. Short CAR uses the shortest window calculated in each study. It turns to be close to zero and non-significant with a p-value of 0.30. This result leads two comments. First, the direction of abnormal returns is the same than for Main CAR: shareholders react positively to straight debt offerings with a similar variance. Second, the significance is lost because this reaction is much lower, with an abnormal return of 0.12%. Hence, shortest windows appear to impact negatively the reported stock reaction.

Disaggregating the CARs and showing the windows reported in the studies underpin this interpretation. Only the [-2,2] window turns out to be significant with a positive shareholders' reaction of 0.66%. This significance is observed for both the mean and the median. This window also displays the higher t-statistic and gathers 75% of the observations. On the contrary, all the windows inferior to 5 days do not present significant abnormal returns. Against, it suggests that wider observation windows may catch more of the shareholders' reaction and explain some heterogeneity between studies. The

I now turn to the t-statistics of studies. Confirming the results for the CARs, the t-statistics Main t and Short t are both positive. They exhibit an important dispersion with very low t. Their standard deviation is also higher than the standard deviation of CARs.

Last, I present the tests for a publication bias in the studies. Figure 1 reports the funnel graph with the solid line representing the mean. The interpretation is uneasy. Studies seem to scatter relatively symmetrically around the mean when the sample size increases. However, there is a cluster of studies with small samples below the mean and an outlier CAR of 2.88%. Hence, it is difficult to conclude to the absence of a publication bias with the funnel graph. I explore more formally this issue with a FAT regression. The specifications 3 and 4 of table 2 reports the regression of t Main and t Short on the standard error of studies. While controlling for the standard error in each sample, the constant of the regressions turns to be non-significant. This result supports the absence of a publication bias in the studies of stock reaction to bond offering.

5.2. Determinants of Heterogeneity

The main result so far is a positive and significant stock reaction to a bond issue. However, there is a major role played by the size of the observation windows. This section aims to explain why the literature has not reached a converging conclusion for the last 30 years. To do so, I use a meta-regression. Table 5 reports the results. Models 1 and 2 use Main CAR as dependent variable. Model 1 is a WLS model with the number of observations by sample as weights and model 2 is an OLS estimation. Models 3 and 4 use Short CAR as dependent variable (WLS and OLS models). Models 5 and 6 are OLS with Main t and Short t as dependent variables. Last, models 7 and 8 are WLS taking into account the presence of samples from the same studies with the number of samples by paper as weights.

5.2.1. Sectorial and Countries Effects

I first investigate if there is a sectorial effect for the shareholders' reaction. The coefficient of both Financials and Industrial turn to be non-significant for both Main CAR, Short CAR and the t-statistics. Hence, shareholders' reaction does not differ across industrial or financial firms. This result tends to undermine the choice usually made in some papers to remove or include some sectors. The stock reaction to a bond offering turns to be similar across industries.

I now consider countries effects, focusing on the variables USA and Emerging. Europe is the omitted group. I also test the difference between the coefficients of USA and Emerging. First the coefficient of USA is not significant. Issuances in the USA do not appear to have a different shareholder reaction than in Europe. Similarly, the variable Emerging is not significant, the stock reaction to issues occurring in emerging markets being not statistically different than those occurring in Europe.

However, the difference between USA and Emerging is positive and significant. Issues which occurred in emerging market bring more value to shareholders. It is noteworthy to stress that this result shows up even when the studies' characteristics are controlled for. It comforts the view that a bond offering in emerging markets is a good signal for the firm value. The t-statistic is also different between issues in emerging markets and both Europe and the US.

The difference of reaction in emerging markets is in line with the literature on the differences in governance system between developed and emerging countries (e.g. La Porta et al., 2002). Even if minority shareholders in emerging countries are more exposed to the risk

of expropriation and the misuse of the bonds proceeds by the management, accessing the bond market sends a positive signal about firm's investments projects.

5.2.2. Announcement vs. Issuance day

This section explores the impact of the event-day. The dummy variable Issuance catches the difference in abnormal returns between studies which choose the issuance day as the event-day instead of the announcement day. The three models with Main CAR as the dependant variable report a significant and negative coefficient for Issuance. It appears that choosing the issuance day as the event-date reduces the reported reaction from 0.49% to 0.7%.

This result comforts the literature on abnormal returns. The information of issuance is progressively incorporated by shareholders from the day of announcement to the day of issuance. Hence, the reaction is much stronger for the announcement than for the issuance day.

However, studies using short observation-windows do not exhibit such an effect. Short CAR turns to be not sensible to the choice between issue and announcement date. It can be explained by the fact that shorter observation windows are overall less sensible to methodological choices. Longer observation windows exacerbate the difference between the issue and announcement date. Looking at the impact of Issuance on the t-statistic the coefficient turns to be non-significant. Choosing the issuance or the announcement day does not appear to impact the significance of the CARs.

5.2.3. The Impacts of Abnormal Returns Modelling

This section investigates if the way abnormal returns are computed explains the results. Three variables focus on this methodological issue: Market Model, Estimation Length and Observation Length.

First, there is little impact of the computation of expected return. The variable Market Model turns to be significant only in model 3 with Short CAR as the dependant variable. To choose a modified or a market model does not affect both the Main CAR and its corresponding t-statistic. This result confirms Brown and Warner (1980) who show that the choice of the model to compute expected returns has a limited impact on abnormal returns.

Second, I investigate the impact of the length of the estimation windows for papers who select a market model. There is no clear guidance of how long the estimation windows

should be. The regression provides contrasting results. First, the variable Estimation Length does not impact the reported shareholders' reaction, either using the Main CAR or the Short CAR. Hence, the selected length does not affect the modelling of the expected return. However, the length of estimation windows impacts negatively the reported t-statistic. This result supports the view that authors should be careful when selecting their modelling parameters as it could impact the significance of results. They should also provide robustness modelling to ensure their results do not stem from the length of the estimation windows.

Last, I focus on the impacts of the length of the observation windows on the reported CARs. The coefficient of Observation Length turns to be significant and positive in almost all the model. It is only non-significant in one unweighted specification using Short CAR as the dependant variable. On average, each day of observation increase shareholders' reaction of 0.16%. Thus, enlarging the observation window increases significantly the reported stock reaction. Hence, the multivariate analysis confirms the univariate results of non-significant Short CAR and significant Main CAR and CAR(-2,2).

This result can be interpreted in opposite ways. One can argue that wider observation windows better catch the stock reaction by allowing anticipations and a time of adjustment for shareholders. One can also argue that wider observation windows are more subject to capture reactions unrelated to the issuance with correlated returns (Barber and Lyon, 1997). In either case, authors should display several windows to ensure the robustness of their results.

Turning to the t-statistics, the coefficients of Observation Length on Main t or Short t are not significant. This result is of interest for studies using the variance of the observation window to test the CARs. In this case, widening the observation period does not impact the significance of the CARs[7].

5.2.4. Screening of the Sample

I now investigate if the screening of the sample the results

Concerning the impact of removing simultaneous events from the sample, two results emerge. On the one hand, the coefficient of Confounding is non-significant in all of the models with Main CAR or Short CAR as dependent variables. Hence, studies which removed the offerings occurring with simultaneous events display similar abnormal returns than studies which do not. On the other hand, these studies yield higher t-statistic, meaning more

[7] Computing the regression for studies using variance over the observation windows only yields similar results (unreported).

significant results. Thus, taking such a precaution turns to be important when assessing the significance of stock reaction.

The second element of sample screening is the maturity type of the issue. The coefficients of Straight Debt are non-significant in all the models with CAR Main or CAR Short as dependent variable. There is also no impact on the t-statistic. The fact that Straight Bond is not significant for CARs first insures that the underlying samples are not polluted by issuances of convertible or warrant bonds. Samples which clearly states that it is composed of straight debt have similar abnormal returns than those which do not make this statement. Second, the systematic checking of hybrid securities in the samples does not turn to be a major issue for event-studies on straight bond issues.

The third indicator of cleanness of the samples is Public Debt. This variable informs us if the sample explicitly states that it encompasses public issuances only. Again, the variable turns to be mute for all the models with CARs as dependent variables. This insures that our meta-analysis is not affected by potential sample misspecifications in the underlying studies. There is only a negative impact of Public Debt on the Main t. Studies which are precautious when defining their sample yield different t-statistic when testing the abnormal return significance.

Last, I consider the coefficient of IPO, which captures the impact of mixing IPOs and seasoned debt offerings in the studies. IPO is positive and significant in two out of three of the models using Main CAR as the dependant variable. This is consistent with the literature which emphasize the uniqueness of IPOs when comparing to seasoned debt offering (e.g. Datta, Iskandar-Datta, and Patel, 2000). However, it does not affect the t-statistics.

Overall, the indicators of sample screening yield two main results. On the one hand, a messy definition of the sample does not affect the CARs, which confirms the robustness of the wealth effect we found. Nonetheless, IPOs should be treated separately to seasoned equity offerings. On the other hand, a careful selection process modifies the t-statistic and the significance of results for two variables, Confounding and Public Debt. Hence, this should support future researches to take such precautions.

5.2.5. The Impact of Top Journals

This section investigates the impact of the level of publication on the results. To do so, the dummy variable Top3 captures the impact of publishing in one of the three best journals in finance.

There is no evidence of an impact of top journals publications in the reported shareholders' reaction. Top3 turns to be non-significant for all the models with CARs as dependent variables. However, Top3 has a positive impact on the t-statistic. Top-ranked journals tend to produce more significant results. This may stems from a more demanding reviewing process leading to a more cautious control of the sample selection and of the impact of modelling choices.

5.2.6. The Choice of the Statistic

Last, this section investigates the role of the statistic computation on the t-statistic. There is a strong impact of the BMP statistic on the level of the t-statistic with a positive and significant coefficient of BMP Stat. Studies which use Boehmer, Masumeci, and Poulsen's (1991) statistic yield more significant t-results than the one using the statistic based on the estimation window. The difference between the BMP Stat and OW Stat coefficients is also positive and significant. Overall, the BMP-statistic yields higher t-statistics.

The fact that the computation of the statistic use to test the significance of abnormal returns has a strong effect on the level of the statistics is of primary importance for the results on bond offerings. Papers using the BMP t-statistic may have concluded differently if they have selected an alternative statistic. This should encourage a careful computation of statistics by authors. A conservative measure would be to combine the use of Brown and Warner's (1985) EW-stat with the observation window OW-stat and Boehmer, Masumeci, and Poulsen (1991) BMP-stat.

6. Conclusion

Since 1984, numerous studies have investigated the stock reaction to a bond offering in order to estimate its value for shareholders. Theoretical literature gives reasons for both a positive and a negative impact on shareholders' value.

Empirical studies do not close the case. Results are particularly difficult to compare as the sample size, the selection of the issues and the techniques used to generate the results and test their significance differs widely across studies. To get a clearer picture on the value shareholders give to a bond issue, this paper offers a meta-analytical approach. I estimated an overall stock reaction from previous studies and disentangle the characteristics of studies to explain the heterogeneity in the previous results.

The main result is a positive shareholders' reaction around a public straight debt offering. This result is robust when taking into account the precision of studies. However, it vanishes when shorter windows are considered. Hence, issuing a bond generally represents positive news for shareholder, as long as the study enlarge the observation period

I then explain the heterogeneity across the previous results performing a multi-regression analysis (MRA). Heterogeneity across CARs is mainly explained by the choice of the event day and the observation length. First, choosing the issue day instead of the announcement date decreases the abnormal returns. Second, the abnormal returns increase with the size of the observation windows explaining non-significant CARs on short windows.

There is a strong impact of the sample screening on the t-statistic. Taking an extra-care to remove simultaneous events substantially increase the reported statistic. The t-statistic is also determined by the choice of the abnormal returns variance. Using the variance over the estimation period strongly reduces the t-statistic of abnormal returns. For future research, the study underlines the sensitivity of the results from event-studies to methodological choices. Researchers should notably take care when screening the sample, selecting their event windows and provide both short and longer windows with alternative statistical tests.

Table 1
Studies of market reaction

The table displays the studies reviewed in the meta-analysis. If a study displays several event windows, the one used in multivariate regression is displayed; if none or more than one is used, the shorter windows is selected. Some papers present more than one sample. The statistic is the one reported by the authors. If the paper only reports the significance level, a corresponding statistic is computed.

Authors	Country	Period	Window	N	*Main Car*	*Main t*
Dann and Mikkelson (1984)	USA	1970-1979	(0,0)	150	-0.33*	-1.67
Dietrich (1984)	USA	1971-1980	(-1,1)	36	0.47	0.68
Eckbo (1986)	USA	1964-1981	(-1,0)	459	-0.06	-0.44
Eckbo (1986)	USA	1964-1981	(-1,0)	189	-0.2*	-1.67
Mikkelson and Partch (1986)	USA	1972-1982	(-1,0)	111	0.06	0.57
James (1987)	USA	1974-1983	(-1,0)	90	-0.11	-0.40
Johnson (1988)	USA	1970-1981	(-1,0)	48	-0.38*	1.98
Kim and Stulz (1988)	USA	1975-1985	(-1,0)	82	-0.29	-0.74
Kim and Stulz (1988)	Europe	1975-1985	(-1,0)	183	0.46***	3.38
Hansen and Crutchley (1990)	USA	1975-1982	(-1,0)	188	0.11	0.52
Bayless and Chaplinsky (1991)	USA	1974-1983	(-1,0)	252	0.10	0.48
Shyam-Sunder (1991)	USA	1980-1984	(-1,0)	297	-0.11	-0.76
Chaplinsky and Hansen (1993)	USA	1974-1984	(-1,0)	245	0.05	0.22
Johnson (1995)	USA	1977-1983	(-1,0)	129	0.32	1.13
Jung, Kim, and Stulz (1996)	USA	1977-1984	(-1,0)	276	-0.09	0.62
Gilson and Warner (1998)	USA	1980-1992	(-1,0)	164	-0.08*	-2.33
Howton, Howton, and Perfect (1998)	USA	1983-1993	(0,0)	937	-0.39***	-5.43
Datta, Iskandar-Datta, and Patel (2000)	USA	1971-1994	(0,1)	143	-0.86**	-2.43
Datta, Iskandar-Datta, and Patel (2000)	USA	1971-1994	(0,0)	17	0.26	0.51
Datta, Iskandar-Datta, and Patel (2000)	USA	1971-1994	(0,0)	39	0.18	0.45
Harvey, Lins, and Roper (2004)	Emerging	1980-1997	(-1,4)	49	-0.40	-0.68
Harvey, Lins, and Roper (2004)	USA/Europe	1980-1997	(-1,4)	240	0.22	0.50
Miller and Puthenpurackal (2005)	USA	1996-2002	(-1,1)	114	0.04	0.46
Miller and Puthenpurackal (2005)	Europe	1996-2002	(-1,1)	36	-0.38	-0.90
Miller and Puthenpurackal (2005)	USA	1996-2002	(-1,1)	72	1.02**	2.50
Chang et al. (2006)	USA	1989-1999	(-1,0)	247	-0.19**	-2.02
Jung (2009)	USA	1966-1997	(-1,1)	1301	-0.20	-1.08
Alam, Hassan, and Haque (2013)	Emerging	2004-2012	(-3,3)	87	1.30	0.19
Cai and Lee (2013)	USA	1970-2010	(-1,1)	1377	-0.24**	-1.91
Chin and Abdullah (2013)	Malaysia	2000-2007	(-5,1)	100	0.59	0.68
Godlewski, Turk-Ariss, and Weill (2013)	Malaysia	2002-2009	(-2,2)	93	1.90	0.73
Bilinski and Mohamed (2015)	USA	1975-2008	(-2,2)	1798	0.26	1.27
Bilinski and Mohamed (2015)	USA	1975-2008	(-2,2)	236	0.46	1.51
Bilinski and Mohamed (2015)	USA	1975-2008	(-2,2)	289	1.88*	1.78
Bilinski and Mohamed (2015)	USA	1975-2008	(-2,2)	548	0.32	0.39
Bilinski and Mohamed (2015)	USA	1975-2008	(-2,2)	761	2.88**	2.22
Bilinski and Mohamed (2015)	USA	1975-2008	(-2,2)	5351	0.29	1.09
Edirisinghe and Nimal (2015)	Sri Lanka	2005-2011	(-1,0)	20	-0.63***	-2.78
Fungacova, Godlewski, and Weill (2015)	Europe	1999-2012	(-1,1)	3277	0.16**	2.12
Klein, Weill, and Godlewski (2015)	Malaysia	2002-2010	(-1,1)	645	0.26	1.14
Klein and Weill (2015)	China	2009-2013	(-1,1)	481	0.27**	2.52

Table 2
T-statistic and Funnel Asymmetry Test

The table displays the regression of t-statistics on the type of computation used in each paper and on the reverse of the standard error (1/se). *BMP Stat* takes one if the paper uses Boehmer, Masumeci, and Poulsen's (1991) statistics and zero otherwise. *OW Stat* takes one if the paper uses a cross-sectional statistic over the observation windows and zero otherwise. Variances are clustered for each study. T-value is reported in parenthesis. ***, ** and * report the 1%, 5% and 10% thresholds of significance.

	(1)	(2)	(3)	(4)
	Main t	*Short t*	*Main t*	*Short t*
BMP Stat	1.507**	1.132*	1.262	1.242*
	(2.26)	(1.92)	(1.63)	(1.76)
OW Stat	0.631	0.427	0.468	0.457
	(0.95)	(0.63)	(0.82)	(0.74)
1/se			-0.103**	-0.0774
			(-2.46)	(-1.59)
Constant	-0.363	-0.189	0.245	0.228
	(-0.74)	(-0.38)	(0.66)	(0.51)
N	41	41	41	41
R^2	0.0714	0.0366	0.186	0.122

Table 3
Presentation of Variables

The table presents the variables use in the meta-analysis. Panel A displays dummy variables. *N* corresponds to the number of samples. The column *N=1* reports the number of sample where the indicator takes one. *Issuances* reports the number of issuances for which the indicator takes one and *% of issuances* relates it to the total number of issuances. Panel B displays statistics for continuous variables.

Panel A: dummy variables

	N	N=1	Issuances	% of issuances	Mean	Std Dev
Industrials	41	5	1,034	5%	0.12	0.331
Financials	41	17	7,410	35%	0.41	0.499
Emerging	41	7	1,475	7%	0.17	0.381
USA	41	31	16,186	77%	0.76	0.435
Europe	41	4	3,736	18%	0.10	0.300
Issuance	41	4	1,034	5%	0.10	0.300
Market Model	41	31	8,589	41%	0.76	0.435
IPO	41	3	1,684	8%	0.07	0.264
Confounding	41	23	8,569	41%	0.56	0.502
Straight Debt	41	21	5,577	26%	0.51	0.506
Public Debt	41	14	3,404	16%	0.34	0.480
Top3	41	14	2,273	11%	0.34	0.480
BMP Stat	41	4	1,306	6%	0.10	0.300
OW Stat	41	21	16,100	76%	0.51	0.506
EW Stat	41	16	3,751	18%	0.39	0.494

Panel B: continuous variables

	N	Mean	Median	Std Dev	Minimum	Maximum
Estimation length (*market model only*)	31	169	140	73	90	301
Observation length	41	3	2	2	0	7

Table 4
Shareholders' Wealth Effect

The table presents shareholders' reaction around public straight debt offering. Two unweighted aggregated CARs are reported: *Main CAR* and *Short CAR*. *Main CAR* corresponds to the CAR reported by studies. If the study reports several windows, the one used in the regression of CARs is reported. If several windows are used in regression or if no regression is computed, the shortest window is selected. *Short CAR* aggregates the shortest window in each sample. *Weighted CAR* is *Main CAR* weighted by the number of observations in each sample. CARs are also reported over four windows. Last, I provide the t-statistics for *Main CAR* (*Main t*) and *Short CAR* (*Short t*). The mean are tested with a t-test and the median with a signtest. ***, ** and * report the 1%, 5% and 10% thresholds of significance.

	N Studies	N Samples	N Issuances	Mean	t	P t>|T|	Median	Std Dev	Min.	Max.
Main CAR	29	41	21,157	0.22*	1.97	0.06	0.1	0.71	-0.86	2.88
Weighted CAR	29	41	21,157	0.01*	1.82	0.08	0	0.02	-0.02	0.10
Short CAR	29	41	21,157	0.12	1.05	0.30	0.05	0.74	-1.43	2.88
CAR[-1;0]	18	20	8,593	-0.06	-0.88	0.39	-0.1	0.31	-0.63	0.58
CAR[0;0]	11	13	7,330	-0.1	-0.49	0.63	0.05	0.77	-1.43	1.43
CAR[-1;1]	13	15	8,783	0.09	0.47	0.64	0.04	0.76	-1.09	1.83
CAR[-2;2]	7	12	15,793	0.66**	2.25	0.05	0.3**	1.01	-0.51	2.88
Main t	29	41	21,157	0.11			0.48	1.71	-5.43	3.38
Short t	29	41	21,157	0.13			0.48	1.77	-5.43	3.38

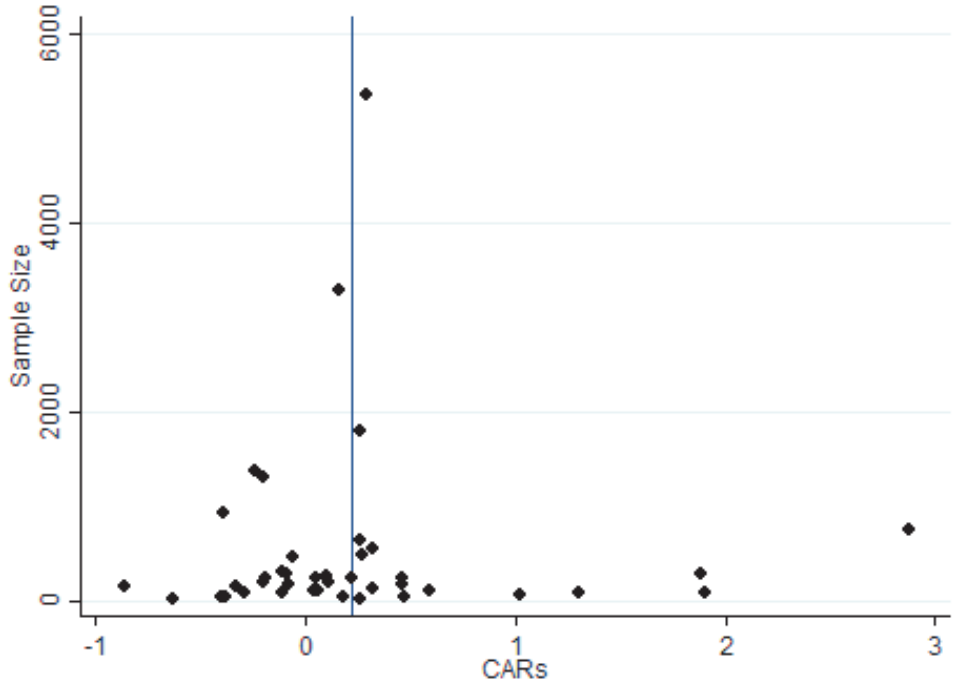
Table 5
Multi-Regression Analysis

The table reports the results of the MRA. Models 1 and 3 are WLS estimation with the number of observation within the sample as weights and models 2 and 4 are unweighted OLS. Dependent variables are *Main CAR* and *Short CAR*. Models 5 and 6 are unweighted OLS with *Main t* and *Short t* as dependent variables. Last, models 7 and 8 are WLS models with the number of samples within each paper. Variances are clustered for each study. T-value is reported in parenthesis. ***, ** and * report the 1%, 5% and 10% thresholds of significance.

Dependant variable	*Main CAR*		*Short CAR*		*Main t*	*Short t*	*Main CAR*	*Main t*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Model	WLS	OLS	WLS	OLS	OLS	OLS	overlap	overlap
Industrials	0.289	0.011	0.202	-0.025	-1.007	-0.086	0.011	-0.809
	(1.61)	(0.06)	(1.11)	(-0.11)	(-1.30)	(-0.10)	(0.06)	(-1.11)
Financials	0.078	0.151	-0.088	-0.249	-0.763	-0.218	0.151	-0.766
	(0.41)	(1.04)	(-0.45)	(-0.95)	(-1.55)	(-0.39)	(1.04)	(-1.44)
Emerging	0.461	0.295	0.231	0.211	-3.151**	-3.809**	0.295	-3.433***
	(1.43)	(0.66)	(0.74)	(0.41)	(-2.43)	(-2.48)	(0.66)	(-3.80)
USA	0.037	0.366	0.019	0.148	-0.827	-1.021	0.366	-1.458
	(0.21)	(1.10)	(0.10)	(0.38)	(-0.61)	(-0.65)	(1.10)	(-1.31)
Issuance	-0.492*	-0.707*	-0.130	-0.391	0.306	0.897	-0.707*	0.500
	(-1.71)	(-1.88)	(-0.43)	(-0.87)	(0.41)	(0.92)	(-1.88)	(0.89)
Market Model	-0.092	-0.015	-0.229*	-0.396	0.771	0.061	-0.015	1.370
	(-0.64)	(-0.06)	(-1.71)	(-1.34)	(0.75)	(0.05)	(-0.06)	(1.06)
Estimation Length	0.000	0.000	0.000	0.000	-0.013***	-0.010	0.000	-0.013***
	(0.49)	(0.07)	(0.48)	(0.23)	(-2.80)	(-1.66)	(0.07)	(-3.08)
Observation Length	0.158***	0.266**	0.116**	0.169	0.137	0.218	0.266**	0.120
	(2.81)	(2.53)	(2.06)	(1.46)	(0.77)	(1.03)	(2.53)	(0.82)
Confounding	-0.094	0.110	-0.048	0.054	1.228**	1.057	0.110	1.216**
	(-0.97)	(0.68)	(-0.52)	(0.27)	(2.19)	(1.67)	(0.68)	(2.47)
Straight Debt	-0.223	0.032	-0.131	0.161	1.170	0.578	0.032	1.035
	(-1.19)	(0.11)	(-0.68)	(0.44)	(1.60)	(0.66)	(0.11)	(1.48)
Public Debt	-0.130	-0.240	-0.221	-0.410	-1.521*	-0.743	-0.240	-1.414**
	(-0.89)	(-1.16)	(-1.18)	(-1.20)	(-1.93)	(-0.76)	(-1.16)	(-2.15)
IPO	-0.265	-0.565*	-0.040	-0.144	-0.922	-1.593	-0.565*	-0.474
	(-1.36)	(-1.71)	(-0.21)	(-0.36)	(-0.93)	(-1.28)	(-1.71)	(-0.57)
Top3	0.142	0.051	0.145	0.276	1.999**	1.166	0.051	1.860**
	(1.05)	(0.28)	(0.94)	(0.97)	(2.16)	(1.00)	(0.28)	(2.09)
BMP Stat					4.248***	3.562***		3.988***
					(3.87)	(2.84)		(3.72)
OW Stat					1.304	0.378		1.358
					(1.45)	(0.37)		(1.63)
Constant	-0.273	-0.866	-0.046	-0.176	-0.107	0.709	-0.866	-0.053
	(-0.81)	(-1.33)	(-0.14)	(-0.25)	(-0.05)	(0.28)	(-1.33)	(-0.03)
Emerging - USA	0.423**	-0.071	0.213	0.063	-2.324***	-2.787***	-0.071	-1.975**
F	4.272	0.046	1.138	0.022	12.647	12.567	0.046	7.560
BMP - OW					5.552***	3.939***		5.345**
F					9.852	8.304		6.203
N	41	41	41	41	41	41	41	41
R^2	0.29	0.42	0.27	0.33	0.67	0.60	0.42	0.71
F	251.634***	5.815***	59.688***	2.811**	18.034***	15.382***	5.815***	15.471***
VIF (highest)	11.391	4.356	11.391	4.356	5.897	6.656	4.356	6.609

Figure 1
Funnel Graph

This graph compares the *Main CAR* of each sample by its corresponding number of observations. The solid line represents the sample mean. If the studies scatter symmetrically around the mean, the graph suggests an absence of publication bias.



Chapter Three

Bond Offerings in China:

The Role of Ownership

Abstract

This study appraises the value created by a bond offering in China, where high levels of state-ownership and insider-ownership raise concerns in the use of the proceeds. To estimate the impact of a bond issue on the firm's value, we apply an event-study methodology on a sample of 481 issues of 347 Chinese companies over the period 2009–2013. It turns out that state-ownership has a positive impact on the value of a bond offering for shareholders, which is consistent with an implicit guarantee of the issue by the state. For privately-owned companies, insider-ownership exerts a non-linear impact on the firm's value, supporting an aligning effect in the use of the proceeds. Overall, the study confirms the key role of ownership structure in Chinese firms.

JEL Codes: G14, P34.

Keywords: China, Ownership, Corporate Bonds.

1. Introduction[8]

In 2014, China's corporate bond market became the first in the world in term of issuance volume as a percentage of GDP.[9] In the meantime, Chinese governance standards remain radically different than those in Western economies (Morck and Yeung, 2014)The objective of this paper is to estimate the impact of Chinese firms' specific ownership features on the value added by a bond offering. This question is of prime interest in appraising China's rapidly expanding bond market. It is also of key interest for the development of corporate bond market in emerging economies in general, as governance and ownership patterns present in China are shared with the majority of emerging countries (Young et al. (2008)).

One of the most salient features of Chinese companies is state ownership with the state (central, or local government) being often the main shareholder in Chinese firms. Such ownership can exert an impact on the way the proceedings of the bonds are used by the management. On the one hand, it can result in inefficient, politically driven investment projects (Chen et al., 2011b). In that case, the bond issue may not enhance shareholders' value. On the other hand, debt issued by a state-owned firm is implicitly guaranteed by the state. This assumption is supported by recent statements from the Chinese planning agency (Reuters, 2015). Furthermore, state-owned enterprises (SOEs) have access to a special type of bonds, enterprise bonds. These bonds are used to fund national projects and are strongly backed by the government. Privileged access to investment projects and a state guarantee may therefore yield positive value for shareholders. Thus, the ultimate impact of a bond issue of a state-owned firm on the firm value remains uncertain.

Chinese listed firms are further characterized by strong ownership concentration and management shareholding (Gul, Kim and Qiu, 2010), both defined as insider ownership. These features may effectively reduce agency conflicts between insiders and shareholders by aligning their interests. However, it may also threaten minority shareholders with expropriation (La Porta et al., 2002). The majority shareholder or the management may expropriate proceeds from the bond issue and "tunnel" the funds out of the firm (Friedman, Johnson, and Mitton, 2003). Nevertheless this effect depends on the level of insider shareholding. At a low level of ownership, insiders may not be able to expropriate outsiders,

[8] This chapter has been written with Laurent Weill and a previous version is available in a *Bank of Finland Discussion Papers (n°33/2015).*

[9] Source: Global Financial Development Database 2016. The ranking excludes small countries with population less than 1 million.

whereas at high level of ownership, they may not be willing to decrease the firm value. Again, the ultimate impact of insider ownership on the valuation of a bond offering by outsider shareholders is uncertain.

We investigate the valuation effect of a bond issue with an event-study methodology. Using data on 481 bond issues of 347 issuers from 2009 to 2013, we measure the change in shareholders' value following a bond offering. We then examine if this change is due to state ownership, ownership concentration or management ownership.

We therefore provide a twofold contribution to the literature. First, we contribute to the burgeoning literature on Chinese corporate bond market by documenting the impact of a bond offering on the firm value. Pessarossi and Weill (2013) have examined the determinants of the choice between corporate bonds and syndicated loans, while Lin and Milhaupt (2017) use a network perspective to explore this market. Our work helps understanding the valuation effects of bond issues in China.

Second, we add an investigation to the wide literature on the influence of ownership structure of firms in China. A large bunch of studies have shown the influence of ownership on financing and investment decisions in China (e.g., Chen et al., 2006; Chen et al., 2011b; Fan, Huang and Zhu, 2013). We extend this literature by analyzing how ownership can affect the value created by a bond offering. We show how state-ownership exerts an impact on the firm value and distinguish among a positive effect generated by a state-guarantee of the bond and a negative effect due to politically-driven investments. We also demonstrate that the value created by a bond offering depend on the alignment of insiders and outsiders' interests. These results are of prime interest for the development of bond market in China and emerging economies in general.[10]

The remainder of the paper is organized as follows. Section 2 provides the background of the research question. Section 3 presents our hypotheses. Section 4 documents data and methodology. The results are reported in section 5. Section 6 concludes.

2. Background

The following brief overview describes the main characteristics of Chinese bond markets and Chinese firm's ownership characteristics.

[10] See Eckbo, Masulis and Norli (2007) for a review.

2.1 Bond markets in China

Chinese bond markets emerged in the 1980s. The 1990s saw an expansion in bond issues, but bond defaults were common due to poor financial reporting and governance mechanisms. After the government bailed out a number of large state companies, it implemented stricter rules on bond market access through the National Development Reform Commission (NDRC). The government required that any corporate bond issue first needed NDRC clearance and set annual quotas on bond issues. It mandated that every issue be guaranteed in full and limited the use of money from a bond issue to fixed asset investment. The tough rules chilled China's bond market. Those left issuing bonds were largely state-owned enterprises (SOEs) – the very firms most likely to get bailed out or otherwise benefit from state favoritism.

The 2004 document "Some Opinions of the State Council on Promoting the Reform, Opening and Steady Growth of Capital Markets" stressed the need to better develop the bond market in order to provide companies with access to large-scale debt financing. In 2007, the issuance approbation process was divided between the NDRC and the China Securities Regulatory Commission (CSRC). The CSRC lifted several impediments to bond market development: annual quotas were eliminated, the People's Bank of China (PBoC) relinquished control of coupons, bank guarantees were no longer compulsory, and proceeds raised could be used for any reasonable purpose.

More recently, the PBoC has been preparing for the rollout of a market-based interest-rate scheme in anticipation of liberalized market-based interest-rate formation and the introduction of benchmark interest rates for policy guidance (PBoC, 2013). KPMG expects bond market growth to accelerate and increase its influence in the financial sector in coming years (KPMG, 2014).

These recent government measures have clearly helped boost the size of the corporate bond market, which reached a valuation of nearly $150 billion in 2013. Chinese companies today are the largest issuers of private bonds through private placement (Çelik, Demirtaş and Isaksson, 2015). The share of SOEs among issuers, despite NDRC favoritism, decreased from 70% in 2007 to 48% in 2009 (Chen, Mazumdar and Surana, 2011).

2.2. Ownership of Chinese Firms

Chinese firms are characterized by high levels of state-ownership, management ownership and ownership concentration.

State-ownership is widespread in China. According to Tian and Estrin (2008), in the early 2000s, the state was the largest shareholder in 43.9% of Chinese companies. In 31.4% of the Chinese firms, the state detains more than 50% of the shares. These figures only account for direct ownership and Peng, Wei and Yang (2011) note that 80% of listed companies are SOEs and 70% of shares are held directly or indirectly by the state. State-ownership can be divided between central and local state-ownership. While central SOEs are directly owned by the central state and encompass among the biggest companies in the country, local SOEs are either hold by a region or a city.

Classification in terms of ownership can be related to firm performance. Chen, Firth, and Xu (2009) show that efficiency varies between privately-owned firms, central SOEs and local SOEs with central SOEs performing the best and privately controlled firms performing the worst. A quite recent development in state-ownership was the 2005 non-tradable shares reform which render public SOEs capital freely negotiable (see for instance Liu and Tian (2012). The trend toward privatization remains however progressive in China (Liao, Liu, and Wang, 2014).

A second common characteristic of Chinese firms is a highly concentrated shareholding. Allen, Qian and Qian (2005) highlight the fact that the state, business conglomerates or funding families hold most of the shares in listed firms. Indeed, not only do most listed firms possess a pyramidal structure, but Xiao and Zhao (2014) point out that 90% of all privately owned firms have pyramidal ownership structures.

Last, Chinese firms are characterized by high levels of management ownership (Chen et al., 2011a). As in other emerging countries, concentrated ownership usually leads to concentrated management ownership, the main owner being the CEO or an influential board member. Family companies also often appoint family members to the board, resulting in high management shareholdings

3. Hypotheses

In this section, we present some hypotheses on the value added by a bond offering for shareholders of Chinese firms. We start with hypotheses on the overall stock market reaction.

We then focus on three characteristics of ownership in China: state ownership, concentration of ownership in the hands of the first shareholder, and management ownership.

3.1 Stock market reaction

Two competing hypotheses explain the reaction of stock market investors following the issue of a corporate bond.

In the first hypothesis, a bond issue generates a positive stock market reaction for two reasons. First, it provides a positive signal that helps solve adverse selection from information asymmetry between firm insiders and outsiders. High quality firms use debt issues, including bonds, to demonstrate their creditworthiness and low probability of default. Second, it reduces moral hazard behavior of managers, thereby helping lower agency costs from conflicts of interest between shareholders and managers. Debt financing puts pressure on managers to perform by restricting the amount of free cash flows at their disposal (Jensen, 1986). Greater debt means higher interest payment obligations and a greater probability of default if these obligations are not satisfied, so there is incentive for managers perform well and avoid bankruptcy.

Under the second hypothesis, in contrast, a decision to issue a bond leads to a negative stock market reaction for three reasons, which are all linked to higher debt loading. First, issuing a bond implies higher agency costs between shareholders and debtholders (Jensen and Meckling, 1976; Myers, 1977). Hence, it increases the cost of the debt for shareholders. Second, the issuance of new debt increases the firm's exposure to bankruptcy costs, which reduces the stock valuation of the company. Finally, issuance of a bond provides management with a large amount of cash that can be inefficiently invested if robust governance mechanisms are not in place (Myers, 2000).

Empirically, shareholder reactions to a bond issue show no distinct pattern and seem to depend on which effect dominates. Dann and Mikkelson (1984), Mikkelson and Partch (1986), and Eckbo (1986) find a negative but insignificant reaction, Chang et al. (2006) and Cai and Lee (2013) found a negative and significant reaction, while Miller and Puthenpurackal (2005), Chang et al. (2006) and Fungacova, Godlewski and Weill (2015) provide evidence of a positive valuation effect. We conclude from the empirical literature that no consensual finding has emerged for the stock market reaction following a bond issue. The reaction is governed by characteristics of the firm and the country where the issuance occurs.

No study we are aware of has investigated stock market reactions following Chinese bond issues, so we can offer no similar former studies to draw upon when tackling this particular question. We expect that stock market reactions should be positive in China because of the pronounced signaling role of bond issues. Here, four aspects of this signaling deserve mention.

First, constraints in the banking industry and the scarcity of bond financing means that most Chinese firms suffer from a lack of access to loan funding (Cousin, 2011). Firms that are able to tap into the bond market are demonstrating access to large-scale funding.

Second, bond financing sends a positive signal of regulatory approval. To secure a bond issue, the regulator requires the firm to submit to a strict administrative vetting, including a proof of three consecutive years of profitability prior to the bond issue. Thus, a bond issue is a regulatory acknowledgement that the issuer enjoys a degree of financial health.

Finally, bond market access tells something about the political relationships of firm managers. Liu and Tian (2010) demonstrate that political relationships play an important role in debt funding in China. Chen et al. (2011a) further observe that these relationships enable firms to extract rents and promote their investments. Hence, issuing a bond is a positive signal that the firm enjoys beneficial political relationships.

3.2 The influence of state ownership

The role of state ownership on the value created by a bond issue is uncertain. On the negative side, the fact of state ownership in itself may be sufficient to provoke a negative stock market reaction. Shirley and Walsh (2001), for example, have shown the lack of managerial incentives and harmful effects of political interference in state-owned firms. Wang and Judge (2010) also note that political objectives in China may prevent management from pursuing profit maximization strategies. Overall, state ownership seems to decrease firm efficiency and depress the value of Chinese companies (e.g. Tian and Estrin, 2008; Chen et al., 2011b).

On the positive side, SOEs enjoy preferential access to a specific type of bonds, enterprise bonds. Enterprise bonds are used to fund nation-wide investment projects, supported by the government. They are larger, more liquid and guaranteed by the state. Consequently, they provide large amounts of funds at low cost to shareholders. The National Development and Reform Commission (NDRC) has recently confirmed that the state will not

let any bond issued by a SOE default (Reuters, 2015). This feature should reduce the cost of funding for the firm and favor a positive stock market reaction.

We consider separately firms owned by the central government and those owned by local or provincial governments. Even if both types of firms are majority-owned by the state, differences could stem factors such as proximity to financial hubs or political connections. The state may have greater incentives to protect central SOEs, because they can have an impact on the whole country and because the management has tighter relationship with the central power.

However empirical evidence has found that, even if state ownership may initially hurts a firm's valuation, the relation between state shareholding and firm value tends to be nonlinear, following a U-curve (Tian and Estrin, 2008). Under this view, a small government stake is off-putting to shareholders as it is seen as encouraging inefficient investment and wealth expropriation. A large government stake, in contrast, is seen as assuring safe investment opportunities, political subsidies, and easy access to funding (Pessarossi and Weill, 2013).

To investigate the impact of state as main shareholder, we use a dummy for SOEs. A value of one is assigned if the firm is owned by the state and a value of zero otherwise (*SOE*). We also use two dummy variables for central SOEs and local SOE. *Central SOE* gets a value of one if the firm is owned by the central state. *Local SOE* takes a value of one if a local government or province owns the firm. We follow the method of Pessarossi and Weill (2013) and use CSI thematic indexes to distinguish among SOEs (Central SOE or Local SOE).[11]

To investigate the impact of state shareholding, we use the percentage of shares owned by the state (*Government Stake*) and its quadratic term.

3.3 The role of ownership concentration

High ownership concentration of Chinese listed companies can influence the value created by a bond offering. Greater ownership concentration could favor firm value by fostering shareholder monitoring of firm managers. This also diminishes any free-riding problems that could impair shareholder control of managers.

However, La Porta et al. (2000) note that the influence of ownership concentration tends to evolve along with investor protections. In countries with weak investor protection, ownership concentration is likely to pose a threat to minority shareholders of abuse or

[11] www.csindex.com.cn

expropriation (Shleifer and Vishny, 1997). Allen, Qian, and Qian (2005) find that corporate governance in China is significantly lower than most of the countries in La Porta et al. (1998) sample. Hence, there is an important risk of expropriation of bonds' proceeds by insiders in China. Specifically, when a main shareholder gains access to a large amount of cash (as when raised by a bond issue), minority shareholders are likely to suffer if the main shareholder "tunnels" the proceeds out of the firm (Johnson et al., 2000; Faccio, Lang and Young, 2009; Fong and Lam, 2014).

We expect an N-shaped relation between the shares hold by the main shareholder and stock market reaction after the bond issuance. With a small stake in the firm, it is difficult for the main shareholder to divert and appropriate company assets. Thus, the main shareholder must also aim at increasing firm value, thereby fully aligning his interests with other shareholders. With an increasing stake, the main shareholder's incentive to tunnel out the proceeds of the bond issue for private gains at the expense of minority shareholders increase only to a certain threshold. Above this threshold of ownership, the majority shareholder's interests again align with those of the minority shareholders. Indeed, a top shareholder's incentive for diverting firm value for private gain becomes counterproductive as it results in personal loss. At this point, Friedman, Johnson and Mitton (2003) show that the bond issue signals an implicit commitment from top shareholder to prop up the firm and not to tunnel out the proceeds.

To investigate the effect of main shareholding, we use the percentage of shares owned by the top shareholder (*Top Shareholder*) and also include the quadratic and cubic terms. We only compute *Top Shareholder* for private firms, since it corresponds to *Government Share* for SOEs.

We also consider ownership concentration with the Herfindahl index from the first to twentieth shareholder of the firm (*Herfindahl Ownership*). Other influential shareholders can mitigate the power of the top shareholder. Following Bai et al. (2004), they can prevent tunneling, closely monitor the management and facilitate takeovers in the case of poor performance. Thus, we expect that dispersed shareholding contributes to a positive stock market reaction to a bond issue because it mitigates the hampering behavior of a controlling shareholder.

3.4 The influence of management ownership

We consider the potential impact of management ownership on the value created by a bond issue. Management ownership is an effective way to resolve principal-agent conflicts by aligning management and shareholders incentives (Jensen and Meckling, 1976), but it still suffers from the same drawbacks as concentrated ownership. Management shareholders, who by their position are authorized to make financial decisions, can also tunnel resources out of the firm.

Thus, following the seminal work of Morck, Shleifer and Vishny (1988) and its extension by Davies, Hillier and McColgan (2005) and Ruan, Tian and Ma (2011), we assume a non-linear N-relationship between management ownership and the stock market's reaction to a bond issue.

As a general observation, a stake in the firm should provide a manager with an incentive to maximize value. Hence we expect an initially positive shareholder reaction to management shareholding. However, a high stake of management in the firm contributes to managerial entrenchment. Entrenched managers are better positioned than others for tunneling resources out of the firm for their private benefit. They can misuse the proceeds of a bond issue for their own sake and destroy shareholder value. As a consequence, we expect a negative relation between shareholder reaction and management shareholding above a low threshold. Above a higher threshold, the interests of managers realign with shareholder interests. Private gains they would benefit from tunneling or misusing resources become inferior to the benefits they obtain by maximizing firm value. The relation between shareholders' reaction and management shareholders is thus expected to be positive for high degree of management ownership.

To investigate this non-linear relation, we use the percentage of shares hold by managers (*Management Stake*) and its quadratic and cubic terms. We use the Bloomberg data on shares held by the management.

4. Data and methodology

The following discussion presents the data and describes the methodology used to compute abnormal returns.

4.1 Data

Our data on bond issues and issuers are taken from the Bloomberg Professional Server. We select issues during the period 2009–2013 to avoid the 2007 non-trading shares reform and the harshest impacts of the global financial crisis. We also exclude financial sector bond issues, and further restrict the sample to issues with original maturities over a year. The limitations allow us to focus on whether the issue significantly impacts shareholder perception of the firm's financial prospects. We focus on straight bonds, excluding convertible bond issues. For stock markets, we consider only A-shares listed on the Shanghai or Shenzhen stock exchanges.

The resulting sample encompasses 481 issues of 347 issuers. We distinguish between SOEs and privately owned enterprises (POEs). As explained above, we used the CSI thematic index composition to classify a firm as state or privately owned. We adopt this classification since the ultimate owner of a firm can be impossible to identify in China, due to pyramidal ownership. However few firms cannot be classified and are dropped from the sample. Table 1 displays the distribution of issues by year, industry, and type of firm. We observe an increase in bond issues over the period. SOEs represent the majority of issuers, even if issues by private firms increase over time.

Table 2 presents the main statistics for the issue variables. For the full sample, the average maturity is around 5 years, spanning from 2 to 13 years. Notably, some part of over 69% of the sample issues went to debt payment. The share of proceeds used to finance investment projects was relatively small; 77% of issues were dedicated to working capital funding. Overall, issues seem mostly to provide a large pot of cash for management rather than going to finance specific capital expenditures.

We explore the role of state ownership in China by comparing the issues made by SOEs and private firms. Most bonds' features are different between both groups. The bonds issued by SOEs are more than twice larger, with a longer maturity. They also pay a lower coupon, while they have the same (mandatory) issue price. Last, SOE bonds are less used to fund working capital and have fewer restrictive covenants. Overall, bonds issued by SOEs seem to be more trusted by investors and less costly for shareholders.

Table 3 displays the main statistics for the issuer variables. We observe a high profitability of firms with a mean EBITDA to assets greater than 7%. Again, we divide the sample between private and state-owned firms. We observe significant differences between both groups of firms. SOEs are larger, either in term of assets or sales. They have a better

access to the debt, with a higher debt ratio, whereas their current ratio is lower. However, SOEs do not have higher profitability than private firms, which can be explained by the fact that all firms should be profitable to be allowed to access the bond market. Concerning ownership, private firms have higher management shareholding and more concentrated ownership with a higher Herfindahl Index. Last, private firms display high level of top shareholding, with a mean above 20% and a maximum reaching 73%.

4.2 Methodology

We use a standard event-study methodology to measure the stock market reaction to bond issues[12]. We compute the abnormal return (AR) around the announcement date. We use a market model for the expected return with the return of the stock defined as:

$$R_{i,t} = \alpha_i + \beta_i . R_{m,t} + \varepsilon_{i,t}, \quad (1)$$

where $R_{i,t}$ is the daily return of the share price of company *i* on day *t*. Returns are computed as $R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}$ with $P_{i,t}$ the closing price of the share *i* on day *t*. $R_{m,t}$ is the market return.

We use the CSI A300 index, which is based on the A-shares of the 300 largest companies listed on the Shanghai and Shenzhen stock markets. This index provides a broad view of market return on Chinese A-shares. It is also consistent with our sample; i.e. firms that issue bonds tend to be large firms. $\alpha_{i,t}$ and $\beta_{i,t}$ are parameters to be estimated through the OLS regression. We use an estimation period of 110 working days from 130 days to 21 days before the issue. Ultimately, $\varepsilon_{i,t}$ consists in the abnormal return over the estimation period, with $E[\varepsilon_{i,t}] = 0$ and $Var[\varepsilon_{i,t}] = \sigma_i^2$.

Thereafter, we compute the abnormal return around the event date:

$$AR_{i,t} = R_{i,t} - E[R_{i,t}] = R_{i,t} - (\widehat{\alpha_i} + \widehat{\beta_i} . R_{m,t}) . \quad (2)$$

We then compute the Cumulative Abnormal Return (CAR) over several windows from two days before the event to two days after. We use three symmetric windows ([0,0], [-1,-1], and [-2,-2]) and two asymmetric windows ([-2,1] and [-1,2]). We also use a wider window from five days before the announcement to five days after ([-5,5]). We compute the CAR for each window:

$$CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i,\tau} , \quad (3)$$

[12] See e.g. MacKinlay (1997) for a review.

where τ_1 is the first day of the window and τ_2 the last day. We then compute the average CAR across companies:

$$\overline{CAR}(\tau_1, \tau_2) = \frac{1}{N}\sum_{i=1}^{N} CAR_i(\tau_1, \tau_2) \, . \quad (4)$$

To test the significance of abnormal returns, we follow two complementary approaches to control for event-induced variance. First, we compute a cross-sectional statistic considering only the variance within the event. This involves dividing the average CAR by its cross-sectional standard deviation over the observation period:

$$\theta^{CS}_{(\tau_1,\tau_2)} = \frac{\overline{CAR}(\tau_1,\tau_2)}{\sqrt{[\frac{1}{N-1}\sum_{i=1}^{N}(\overline{CAR}_i(\tau_1,\tau_2) - \overline{CAR}(\tau_1,\tau_2))]^2}} \, . \quad (5)$$

We next compute Boehmer, Masumeci, and Poulsen's standardized cross-sectional statistic (Boehmer, Masumeci and Poulsen, 1991) which combines variance over the estimation period and within the event period. We first obtain the variance of abnormal returns over the estimation period:

$$\sigma_i^2(\tau_1, \tau_2) = (\tau_2 - \tau_1 + 1).\sigma^2_{i,AR^e} \, . \quad (6)$$

With AR^e the abnormal return over the estimation period, the CAR of each company is standardized by the standard deviation of abnormal returns over the estimation period. This provides the standardized cumulated abnormal return (SCAR):

$$SCAR_i(\tau_1, \tau_2) = \frac{CAR_i(\tau_1,\tau_2)}{\sqrt{(\tau_2-\tau_1+1).\sigma^2_{i,AR^e}}} \, . \quad (7)$$

The standardized cross-sectional statistic is then obtained by dividing the cross-sectional average SCAR over its cross-sectional standard deviation during the event period:

$$\theta^{BMP}_{(\tau_1,\tau_2)} = \frac{\frac{1}{N}\sum_{i=1}^{N} SCAR_i(\tau_1,\tau_2)}{\sqrt{[\frac{1}{N-1}\sum_{i=1}^{N}(SCAR_i(\tau_1,\tau_2) - \frac{1}{N}\sum_{i=1}^{N} SCAR_i(\tau_1,\tau_2))]^2}} \, . \quad (8)$$

Finally, we perform a sign test on the median to test if the results are not led by a skewed distribution.

Having computed our CARs, the second part of the analysis considers CAR determinants. Here, we perform OLS regressions with clustered standard errors at the issuer level. Our dependent variable is the CAR computed on a [-1,1] event window.

In addition to tested determinants on ownership, we include control variables to take into account characteristics of issuance and issuer. We consider three issuance characteristics: the logarithm of *Amount Issued*, the logarithm of *Maturity* and the *Coupon*. We also take into account five issuer characteristics: size (log of *Sales*), market valuation (*Market-to-Book*),

leverage (*Debt-to-Assets*), financial health (*Current Ratio*), and profitability (*Ebitda-to-Assets*). All variables are described in the Appendix.

5. Results

We begin this section with the univariate results of the event study for the stock market reaction to the announcement of a bond issue. We then provide our multivariate estimations. The section ends with a discussion of our robustness checks.

5.1 Univariate results

Table 4 displays summary statistics for cumulative abnormal returns around bond announcements for a variety of event windows. Looking at the full sample, it is clear that CARs are positive and significant for all event windows with the exception of [0,0]. Hence, the results support a positive stock market reaction to bond announcements in China. This conclusion accords with the view that debt is perceived as a positive signal for stock market investors. The issue may signal that the firm has access to valuable investment projects and is able to secure large-scale funding. In the case of China, a bond issue is especially good news because the bonds are implicitly guaranteed by the state, providing the firm with a low cost of funding. Moreover, the issue signals that the firm has the political relays necessary to issue a bond and to conduct investments using these relations.

Second, this positive reaction may stem from the positive effect of a bond issue on agency costs. As Chinese firms are characterized by a concentrated ownership, a bond issue may align the interests of insiders and outsiders and lower the risks of expropriation.

To estimate the role of state ownership, we next analyze to see if this finding stands for all ownership types or whether form of ownership influences stock market reaction. If the role of the state, through an implicit guarantee of the bond or political relations, explains the positive stock reaction, we should especially observe it for SEOs. Examine CARs for SOEs (both central and local) and POE, we find that the CARs are only significantly positive for SOEs (and not significant for POE). We then break down our SOE result by considering separately central SOEs and local SOEs. Here, we observe that the stock market reaction is only significantly positive for central SOEs (although the differences between categories are not significant either in mean or median).

The finding of a positive stock market reaction only for SOEs can be interpreted with three explanations. First, bonds issued by SOEs are of better quality for the valuation of companies. The observed differences in the characteristics of bonds issued by SOEs and by private firms support the interpretation of the finding. Bonds issued by SOEs are less costly, less used for working capital purposes and entail less restrictive covenants for shareholders. A second explanation is the use of the proceeds. Because the bonds issued by SOEs benefit from a political support and are used for state investments, they are more likely to be profitable for shareholders. Last, SOEs shareholders are not exposed to the default of the bond. Because there is an explicit guarantee of SOEs bonds by the state, the probability of default is quasi null. Hence, a bond issue is a risk-free funding for a SOE and its shareholders.

The result that local SOEs do not exhibit such a positive reaction can be explained through the comparison of the characteristics of central and local SOEs issues and issuers. In this aim, Table 5 provides the comparison of statistics for both groups of SOEs. We observe major differences between both groups. First, issues made by central SOEs are larger, of longer maturity, and less costly with a significant lower coupon. Therefore these differences in terms of issue quality help explaining the difference in stock market reaction. However, unlike private firms, the proceeds of both local and central SOEs are used for similar purposes and they do not have different level of restrictive covenants.

Second, when considering issuers' features, central SOEs are larger than local SOEs. Central SOEs also have a larger government share than local SOEs, which implies that the state is more concerned by the former firms. Hence, central SOEs may have access to better investment projects and benefit from a stronger state guarantee on their debt. Thus, the positive reaction for central SOEs can overall be attributed to issues of better quality as well as a higher government stake in the firm, which may provide better investment projects and a stronger state guarantee.

We now turn to the multivariate analysis to isolate the role of issue's and issuer's features from ownership characteristics.

5.2 Multivariate results

In our regressions of cumulative abnormal returns, the dependent variable is the cumulative abnormal return over the [-1,1] event window. We do this for two reasons. First, we want to check if the finding for positive stock market reaction for central SOEs is still observed when issue and issuer variables are included. Second, we want to see how

ownership and management characteristics influence the stock market reaction following a bond issue.

To test the hypotheses on state ownership, top shareholding, and management ownership, we perform three sets of regressions, which are reported in Tables 6 through 8. In each table, the same control variables for issue and issuer characteristics are included. Table 6 displays estimations on the role of state ownership. Table 7 provides estimations on top shareholding and shareholding concentration. Table 8 presents regressions on management ownership.

Table 6 presents five estimations to investigate the role of state ownership. The first and second column displays the results alternatively with *SOE* and *Central SOE* as the key variable so that we can refine our univariate results. We find that SOEs do not exhibit a higher stock reaction. However, the stock reaction for central SOEs is significantly different than for private firms and local SOEs. This result appears when controlling for issuance and issuer features, since we perform a multivariate approach. Hence, it is not the higher quality of issues which explains a better stock reaction, but the fact that the issuer is a central SOE. This finding supports both the hypotheses of a state guarantee of the bond and an access to more valuable investments because of stronger political links.

We explore further the role of state ownership by using the government stake in the firm instead of a dummy variable. We test for a linear and a quadratic relationship with stock reaction. These estimations are displayed in the third and fourth column of Table 6. We find no evidence of a linear relation between the government share in the firm and the stock reaction: the variable *Government Stake* is negative but not significant. However, when testing the quadratic relation, we find that *Government Stake²* turns to be negative and significant, whereas *Government Stake* remains mute. Hence, there is a negative effect of state ownership, but only after a positive effect first takes place.

This concave relation is in opposition with our hypothesis of a U-shaped relation between government share and the stock reaction. However, there are some reasons to believe that this relation is not the same for SOEs and private firms. Whereas private firms may benefit from high share of state ownership thanks to the opportunities it provides, state-owned firms may be harmed by excessive state ownership, because of political and bureaucratic interferences. We therefore allow for a different relation between *Government Stake* and the stock reaction between private firms and *SOEs* by adding an interaction term to our model in the fifth column of Table 6. *Private×Government Stake* and *Private×Government Stake²* are the interaction terms between *Private* (a dummy variable equal to one if the firm is a POE)

and *Government Stake*. Both interaction terms inform on the relation between government stake and abnormal returns for private firms. Consequently, *Government Stake* and *Government Stake²* inform on this relation for SOEs.

The findings for this latter specification support our hypothesis of a different relation between government share and abnormal returns for SOEs and for private firms. Private firms do not exhibit a U-shaped relation. If the government stake first decreases the stock reaction and then increases it, the coefficients are not significant. On the contrary, SOEs display some evidence of a concave relation. For SOEs, the government stake increases the stock return to a bond offering, but only if the share holds by the state is below 10.1%. Above this threshold, a higher government stake progressively hampers the stock reaction.

The absence of significance for control variables support a lack of heterogeneity in issuance and financial characteristics, a finding consistent with highly regulated bond markets. Because the CRSC only allows profitable firms to tap the bond market and strictly controls issuance characteristics, issuance and issuer characteristics do not appear to play a role in shareholder reactions. Instead, it is the proximity to the state which gives value to the offering.

Table 7 presents the estimations for the role of top shareholding on stock reaction of private firms. The first column displays the results with *Top Shareholder*. We then add *Top Shareholder²* in the second column and also *Top Shareholder³* in the third column so that we consider a nonlinear relation. To take into account ownership concentration, we also include the Herfindahl index of shareholding concentration.

With the linear specification, we observe a negative and significant impact of the stake owned by the first shareholder. This effect is substantial, since an increase of 1% of top shareholding decrease the stock reaction of 0.117%. However, this conclusion is different when we allow non-linear effects. Confirming our hypothesis, we find some evidence for a cubic relation with the stock reaction, while our quadratic specification turns to be non-significant. Indeed *Top Shareholder* and *Top Shareholder²* are not significant in the second specification, while *Top Shareholder²* and *Top Shareholder³* are respectively significantly negative and significantly positive in the third specification.

More precisely, the stock reaction is positive, albeit non-significant, until the share of the top shareholder reaches 5%. Minority shareholders can fear that the top shareholder tunnels the proceeds of the issuance, which reduces the value of the firm. However, confirming our hypothesis, this effect vanishes above an upper threshold of 44%. Above this percentage, the impact of *Top Shareholder* is positive: the interests of the top shareholder and

minority shareholders are aligned anew. The reason is that is becomes too costly for the top shareholder to extract value from the firm, without hampering its own benefits.

What to conclude from these estimations? First, the effect of the stake owned by the first shareholder overall hampers the stock reaction to a bond offering. Minority shareholders can fear to be expropriated, that is the proceeds of the issue to be misused by the first shareholder. However, this effect is not linear, and appears only when the stake of the first shareholder is above 5% or below 44%. On the contrary, when the stake of the top shareholder is either very low or very high, it contributes to a positive stock reaction.

Table 8 provides the estimations for management ownership with *Management Stake* as the key variable. We subsequently test a linear, quadratic and cubic relation with shareholders' reaction to the bond issue in the three specifications by considering first only *Management Stake* and then by adding incrementally the squared term and the cubic term.

We find that *Management Stake* is not significant in the first specification, while neither *Management Stake* nor *Management Stake*^{2} are not significant in the second specification. However we obtain results confirming our hypothesis with the cubic specification: we observe significant coefficients that are positive for *Management Stake* and *Management Stake*^{3}, and negative for *Management Stake*^{2}. These results imply the existence of an N-curve for the relation between management ownership and stock market reaction in line with our hypothesis on tunneling and management ownership. They show that the relation between shareholder value and management ownership follows a non-linear relationship as reported by Morck, Shleifer and Vishny (1988) for firm value. The results also support the view that bond issues are not necessarily associated with fear of tunneling or propping. Shareholder expectations depend on the size of management holdings in the firm.

The N-shaped relationship is observed with 5% and 31% as turning points. It appears that interests of management and shareholders in a bond issue are initially aligned (up to 5% of management ownership). Shareholders expect management to use the proceeds of the issue in a manner consistent with their own interests. However, as the size of the stake held by management expands and cross 5% of the shares, shareholders expect a divergence from their own interests. Since bond issues provide large cash flows to management, they fear the proceeds may be misused and diverted to non-productive investments or tunneled out the firm. Finally, when stake held by management reaches a certain size (exceeds 31%), the interests of shareholders and management appear to realign. Above this threshold, an increase in the management stake improves the stock reaction.

When looking at the sample of firms, we point out that only 13% of firms have a management stake ranging from 5% to 31%. Hence the effect of management shareholding is positive for the vast majority of firms.

5.3 Robustness checks

We check the robustness of our results by calculating abnormal returns with alternative indexes to compute expected returns. Our finding can be driven by the use of the stock market index. Specifically, we compute abnormal returns using CSI sector indexes in the expected return calculation. To accomplish this, we perform regressions of the return of each company on its sector index, relying on Morgan Stanley's Global Industry Classification Standard (GICS) classification.

Table 9 provides CARs with the new computations. We again observe a positive stock market reaction to bond announcements by SOEs, and more specifically, central SOEs. These results corroborate our main findings observed in the main univariate results.

Table 10 displays regressions with the new CARs. We use the CAR obtained with the [-1,1] event window as the dependent variable. We test the three main specifications of our explanatory variables. We obtain similar results for the role of central state ownership, government stake, and management stake. More precisely, we observe a positive effect of *Central SOE* and a quadratic relation between government share and the abnormal returns. We also find evidence of an N-shaped relation between management shareholding and stock market reaction.

However, we do not observe significant coefficients for the cubic specification of *Top Shareholder*, even if the sign of the estimates are similar. Hence, we qualify our results on the role of top shareholding.

6. Conclusion

This study examined the impact of bond offerings on Chinese firms' value. The expansion of corporate bond markets in the recent years has given rise to questions regarding the use and the impact of bonds as a means for large-scale corporate financing. Using an event-study methodology, we investigated how shareholders react to corporate bond issues and how much they value a bond offering. Our main findings are summarized below.

Bond issuance in China favors a positive stock market reaction. This key result supports the view that issuing a bond gives a positive signal to Chinese stock markets in line with the hypotheses on the signaling role of the bond.

Ownership structure of the firm is a key determinant of the value created by a bond issuance. First, our univariate results suggest that the positive stock market reaction only applies to central state-owned companies. Our multivariate analysis shows that central state-ownership increases the value of the firm when they access the bond market. We reject a negative effect of politically-driven investments and attribute this finding to the explicit state guarantee of the bonds issued by central SOEs, and the privileged access to investment projects.

We also find evidence of the role of manager ownership with a N-shaped relation between shareholders' reaction and management ownership. Management ownership contributes to an increase in stock value following bond issuance when the management ownership is either less than 5% or more than 44% of the company. This result confirms the prime role of the alignment of interests between insiders and outsiders in China and the risk of expropriation outsiders are potentially facing.

These findings provide important insights on the role of ownership structure in China. Of particular relevance is the finding that investors attach value to state and management ownership. It underlines that China specific governance issues, stemming from its political organization and economic institutions exert an impact on the corporate bond market. We therefore open avenues for further research. Future projects could consider the identity of bondholders. Lastly, it would be important to identify political connections at the firm level to better understand the reaction.

Table 1
Distribution of sample issues

This table gives the composition of bond issues in the sample by year and sector (GICS classification). Private firms and state-owned enterprises are sorted according to CSI thematic indexes.

	Total	Private Firms	State-Owned Enterprises
Year			
2009	7	2	5
2010	26	4	22
2011	92	25	67
2012	198	77	121
2013	158	54	104
Industry			
Consumer discretionary	68	35	33
Consumer staples	18	12	6
Energy	25	8	17
Health	24	18	6
Industrials	150	34	116
Info tech	16	12	4
Materials	139	38	101
Telecoms	1	1	0
Utilities	40	4	36
Total	481	162	319

Table 2
Descriptive statistics: Issues

This table presents statistics for issues. *Amount Issued* are in millions of yuan, Issue Price and *Coupon* in percent, and maturity in years. *Debt Payment* and *Working Capital Funding* are dummy variables. *Debt Payment* equals one if the proceeds are used to repay debt and zero otherwise. *Working Capital Funding* gets a value of one if the proceeds are used to finance working capital and zero otherwise. *Restrictive Covenant* is a dummy variable that has a value of one if the issue includes covenants that impair shareholder flexibility. We test the mean and median differences between state-owned firms and private firms with a Student t-test and a non-parametric equality-of-median test respectively. ***, **, and * report the 1%, 5%, and 10% thresholds of significance.

	N	Mean	Median	Std. dev.	Minimum	Maximum
Full Sample						
Amount issued (M)	481	1574.636	800	2348.489	50	20000
Issue Price	481	480	100.00	100	0.000	99.99999
Coupon	481	5.87	5.71	0.981	0	9.6
Maturity (years)	481	5.20	5.00	1.663	2.00	12.92
Debt Payment	481	0.69	1	0.465	0	1
Working Capital Funding	481	0.77	1	0.419	0	1
Restrictive Covenant	432	0.81	1	0.389	0	1
SOEs						
Amount issued (M)	319	1944.3***	1000***	2748.208	90	20000
Issue price	319	100	100	0.000	100	100
Coupon	319	5.58***	5.55***	0.851	0	7.99
Maturity (years)	319	5.34***	5***	1.843	1.998631	12.91764
Debt Payment	319	0.67	1	0.472	0	1
Working Capital Funding	319	0.73***	1	0.443	0	1
Restrictive Covenant	277	0.78**	1	0.415	0	1
Private firms						
Amount issued (M)	162	846.73***	600***	849.638	50	6000
Issue price	161	100	100	0.000	100	100
Coupon	162	6.42***	6.2***	0.982	4.2	9.6
Maturity (years)	162	4.93***	5***	1.192	2.997947	8
Debt Payment	162	0.72	1	0.449	0	1
Working Capital Funding	162	0.85***	1	0.356	0	1
Restrictive Covenant	155	0.88**	1	0.329	0	1

Table 3
Descriptive statistics: Issuers

The table presents statistics of issuers. *Sales* and *Total Assets* are in millions of yuan. *Top Shareholder* is the percentage owned by the first shareholder of a private firm. We test the mean and median differences between state-owned firms and private firms with a Student t-test and a non-parametric equality-of-median test respectively. ***, **, and * report the 1%, 5%, and 10% thresholds of significance.

	N	Mean	Median	Std. dev.	Minimum	Maximum
Full Sample						
Sales	432	52,680.41	6,621.47	239,639	254.26	2,786,045
Total Assets	432	60,911.41	11,772.41	204,654	485.26	2,342,110
Market-to-Book	429	2.10	1.69	1.449	0.37	11.85
Debt to Assets (%)	432	37.50	36.73	14.261	5.37	75.86
Current Ratio	432	1.50	1.25	1.098	0.21	8.45
Ebitda-to-Total-Assets (%)	431	7.38	6.87	4.248	-6.00	22.33
Management Stake (%)	320	5.87	0.02	13.406	0.00	69.31
Government Stake (%)	298	18.09	5.25	19.566	0.00	87.89
Herfindahl Ownership	432	926.54	695.68	960.048	0.00	7,724.78
SOEs						
Sales	276	77,873.44***	9,254.19***	296833.300	256.98	2,786,045
Total assets	276	89,064.53***	19,380.69***	251,576.000	1,319.70	2,342,110
Market-to-Book	275	1.74***	1.41***	1.140	0.37	10.16
Debt to Assets	276	39.34***	39.95***	14.643	5.37	75.63
Current Ratio	276	1.17***	1.11***	0.656	0.21	4.68
Ebitda to Assets (%)	275	7.43	6.89	4.305	-6.00	22.33
Management Stake (%)	175	0.51***	0***	2.522	0.00	25.83
Government Share (%)	142	36.68***	36.63***	11.737	15.66	87.89
Herfindahl Ownership	276	836.45***	463.45***	1,011.515	0.00	7724.78
Private firms						
Sales	156	8,108.13***	3,456.25***	15,160.570	254.26	104,962.30
Total assets	156	11,102.04***	6,243.09***	16,279.410	485.26	109,911.50
Market-to-Book	154	2.73***	2.33***	1.707	0.69	11.85
Debt to Assets	156	34.23***	31.96***	12.975	9.90	75.86
Current Ratio	156	2.07***	1.64***	1.439	0.40	8.45
Ebitda to Assets (%)	156	7.28	6.77	4.158	-3.82	21.83
Management Stake (%)	145	12.33***	1.15***	17.705	0.00	69.31
Government Share (%)	156	1.17***	0***	1.870	0.00	9.78
Herfindahl Ownership	156	1,085.94***	920.36***	841.182	0.00	5,386.91
Top Shareholder (%)	145	28.86	27.22	12.517	4.14	73.38

Table 4
Cumulative Abnormal Returns

This table presents cumulative abnormal returns (CARs) over six windows around the issue announcement date (t=0). We give CAR values for the entire sample and then break them down into subdivisions. Significance is investigated with a Student t-test with the cross sectional t-statistic (θ^{CS}) and Boehmer, Masumeci, and Poulsen's (BMP) statistic (θ^{BMP}). We use a sign test to test the significance of median and report its p-value. ***, **, and * report the 1%, 5%, and 10% thresholds of significance.

	N	$\overline{CAR}$	Negative CAR (%)	θ^{CS}	T>|θ^{CS}|	θ^{BMP}	T>|θ^{BMP}|	P Sign test
Full Sample								
[0,0]	481	0.049	55.30	0.61	0.54	0.9	0.37	0.02**
[-1,1]	481	0.270	47.40	1.89*	0.06	2.52**	0.01	0.27
[-2,2]	481	0.331	50.73	1.8*	0.07	2.08**	0.04	0.78
[-1,2]	481	0.311	51.77	1.94*	0.05	2.31**	0.02	0.47
[-2,1]	481	0.290	48.86	1.72*	0.09	2.2**	0.03	0.65
[-5,5]	481	0.492	49.90	1.79*	0.07	2.36**	0.02	1
SOE								
[0,0]	319	0.084	54.95	0.86	0.39	0.97	0.33	0.09*
[-1,1]	319	0.280	45.45	1.64	0.10	2.09**	0.04	0.12
[-2,2]	319	0.351	50.47	1.56	0.12	1.61	0.11	0.91
[-1,2]	319	0.378	50.16	1.95*	0.05	2.06**	0.04	1
[-2,1]	319	0.252	46.39	1.23	0.22	1.58	0.12	0.22
[-5,5]	319	0.654	47.34	2.13**	0.03	2.45**	0.01	0.37
Central SOE								
[0,0]	108	0.161	50.93	1	0.32	1.6	0.11	0.92
[-1,1]	108	0.608	42.59	1.95*	0.05	2.2**	0.03	0.15
[-2,2]	108	0.641	49.07	1.74*	0.08	1.81*	0.07	0.92
[-1,2]	108	0.743	47.22	2.24**	0.03	2.24**	0.03	0.63
[-2,1]	108	0.507	44.44	1.46	0.15	1.77*	0.08	0.29
[-5,5]	108	1.177	44.44	1.95*	0.05	2.21**	0.03	0.29
Local SOE								
[0,0]	211	0.044	57.07	0.36	0.72	-0.01	0.99	0.05*
[-1,1]	211	0.112	46.92	0.55	0.58	0.77	0.44	0.41
[-2,2]	211	0.202	51.18	0.71	0.48	0.56	0.58	0.78
[-1,2]	211	0.192	51.66	0.8	0.42	0.74	0.46	0.68
[-2,1]	211	0.122	47.39	0.48	0.63	0.54	0.59	0.49
[-5,5]	211	0.386	48.82	1.12	0.27	1.28	0.20	0.78
Private firms								
[0,0]	162	-0.019	55.97	-0.14	0.89	0.14	0.89	0.15
[-1,1]	162	0.251	51.23	0.96	0.34	1.4	0.16	0.81
[-2,2]	162	0.292	51.23	0.92	0.36	1.35	0.18	0.81
[-1,2]	162	0.179	54.94	0.63	0.53	1.05	0.30	0.24
[-2,1]	162	0.364	53.70	1.21	0.23	1.62	0.11	0.39
[-5,5]	162	0.174	54.94	0.32	0.75	0.69	0.49	0.24

Table 5
Local and Central SOEs

The table presents statistics of central and local SOEs issues and issuers. The variables are the same as in tables 2 and 3. We test the mean and median differences between central and local SOEs with a Student t-test and a non-parametric equality-of-median test respectively. ***, **, and * report the 1%, 5%, and 10% thresholds of significance.

	N	Mean	Median	Std. dev.	Minimum	Maximum
Panel A: Issues						
Central SOEs						
Amount issued (M)	108	3,363.98***	2,450***	4,060.316	200	20,000
Issue Price	108	100	100	0	100	100
Coupon	108	5.15***	5.11***	0.885	0	7.99
Maturity (years)	108	5.67**	5	2.108	3.00	12.92
Debt Payment	108	0.68	1	0.470	0	1
Working Capital Funding	108	0.73	1	0.445	0	1
Restrictive Covenant	94	0.74	1	0.438	0	1
Local SOEs						
Amount issued (M)	211	1,217.63***	840***	1,212.301	90	9500
Issue price	211	100	100	0	100	100
Coupon	211	5.8***	5.7***	0.743	3.6	7.9
Maturity (years)	211	5.17**	5	1.671	2	10
Debt Payment	211	0.66	1	0.474	0	1
Working Capital Funding	211	0.73	1	0.443	0	1
Restrictive Covenant	183	0.8	1	0.403	0	1
Panel B: Issuers						
Central SOEs						
Sales	95	195,400.1***	47,942.92***	485,261.3	554.22	2,786,045
Total assets	95	211,005.1***	62,992.38***	401,011.7	2,823.34	2,342,110
Market-to-Book	94	1.47***	1.24***	0.797	0.51	4.31
Debt to Assets	95	39.04	39.85	16.922	5.37	75.63
Current Ratio	95	1.08*	1.1	0.578	0.21	2.71
Ebitda to Assets (%)	95	7.14	6.59**	4.104	-5.54	18.33
Management Stake (%)	48	0.38	0	1.725	0.00	10.87
Government Share (%)	36	40.79**	40.9	13.706	15.66	87.89
Herfindahl Ownership	48	1,463.19	1,263.89	1,305.874	15.95	7,724.78
Local SOEs						
Sales	181	16,188.19***	7509.73***	22,896.400	256.98	110,138.50
Total assets	181	25,062.56***	13,809.17***	27,353.640	1319.70	166,898.00
Market-to-Book	181	1.88***	1.57***	1.262	0.37	10.16
Debt to Assets	181	39.5	39.97	13.340	7.83	71.85
Current Ratio	181	1.23*	1.13	0.689	0.25	4.68
Ebitda to Assets (%)	180	7.58	7.22**	4.411	-6.00	22.33
Management Stake (%)	127	0.56	0	2.769	0.00	25.83
Government Share (%)	106	35.29**	34.98	10.706	15.73	62.53
Herfindahl Ownership	127	1,264.78	1,180.88	837.614	0.12	3,909.87

Table 6
Regression of cumulative abnormal returns on state ownership

The table presents the regression of CAR [-1,1] on issuance and issuer variables. Variances are clustered at the issuance level, with the t-statistic is reported in parentheses, and the F-statistic in brackets. ***, **, and * report the 1%, 5%, and 10% thresholds of significance.

	CAR[-1,1]				
SOE	-0.0268				-0.646
	(-0.07)				(-0.81)
Central SOE		0.720*			1.164**
		(1.75)			(2.31)
Government Stake			-0.00475	0.00531	0.0117
			(-0.47)	(0.43)	(0.53)
Government Stake²				-0.000490**	-0.000579**
				(-2.24)	(-2.56)
Private × Government Stake					-0.280
					(-0.95)
Private × Government Stake²					0.0432
					(1.13)
Amount Issued (log)	-0.122	-0.141	-0.0146	0.00764	0.0335
	(-0.52)	(-0.61)	(-0.05)	(0.03)	(0.12)
Maturity (log)	0.488	0.429	-0.133	-0.188	-0.226
	(0.91)	(0.80)	(-0.20)	(-0.28)	(-0.33)
Coupon (%)	-0.136	-0.0652	-0.109	-0.0978	-0.105
	(-0.82)	(-0.39)	(-0.53)	(-0.48)	(-0.51)
Sales (log)	-0.0555	-0.117	-0.251	-0.264	-0.343*
	(-0.40)	(-0.84)	(-1.50)	(-1.62)	(-1.97)
Market-to-Book	-0.0939	-0.0866	-0.200	-0.198	-0.170
	(-0.87)	(-0.85)	(-1.60)	(-1.61)	(-1.27)
Ebitda-to-Assets (%)	0.0347	0.0398	0.0825*	0.0704	0.0712
	(0.97)	(1.11)	(1.80)	(1.59)	(1.61)
Debt-to-Assets	-0.00887	-0.00902	-0.00668	-0.00841	-0.00388
	(-0.75)	(-0.77)	(-0.45)	(-0.57)	(-0.26)
Current Ratio	0.0418	0.0479	0.0788	0.0864	0.0495
	(0.25)	(0.30)	(0.43)	(0.48)	(0.27)
Constant	1.853	1.990	3.353	3.425	4.000
	(0.96)	(1.06)	(1.39)	(1.43)	(1.64)
N	477	477	318	318	318
Number of issuers (clusters)	344	344	246	246	246
R^2	0.00901	0.0155	0.0251	0.0335	0.0473

Table 7
Regression of cumulative abnormal returns on top shareholder

The table presents the regression of CAR [-1,1] on ownership variables. The key variable is *Top Shareholder*. Hence, the sample only includes private firms. Variances are clustered at the issuance level, with the t-statistic is reported in parentheses, and the F-statistic in brackets. ***, **, and * report the 1%, 5%, and 10% thresholds of significance.

	CAR[-1,1]		
Top Shareholder	-0.117*	-0.0990	0.174
	(-1.74)	(-1.31)	(0.99)
Top Shareholder^2		-0.000711	-0.00949*
		(-0.41)	(-1.86)
Top Shareholder^3			0.0000864*
			(1.84)
Herfindahl Ownership	0.00143	0.00186	0.00161
	(1.35)	(1.13)	(0.95)
Amount Issued (log)	-0.208	-0.179	-0.171
	(-0.39)	(-0.33)	(-0.32)
Maturity (log)	1.108	1.109	0.717
	(0.85)	(0.85)	(0.55)
Coupon (%)	-0.0585	-0.0535	-0.132
	(-0.18)	(-0.16)	(-0.39)
Sales (log)	-0.133	-0.143	-0.221
	(-0.42)	(-0.45)	(-0.72)
Market-to-Book	-0.164	-0.173	-0.170
	(-1.09)	(-1.16)	(-1.12)
Ebitda-to-Assets (%)	0.0530	0.0522	0.0556
	(0.80)	(0.79)	(0.85)
Debt-to-Assets	-0.0195	-0.0203	-0.0207
	(-0.82)	(-0.85)	(-0.87)
Current Ratio	0.107	0.0932	0.0652
	(0.54)	(0.48)	(0.34)
Constant	3.627	3.255	2.808
	(0.83)	(0.73)	(0.65)
N	149	149	149
Number of issuers (clusters)	128	128	128
R^2	0.0515	0.0525	0.0662

Table 8
Regression of cumulative abnormal returns on management ownership

The table presents the regression of CAR [-1,1] on management ownership. Variances are clustered at the issuance level, with the t-statistic is reported in parentheses, and the F-statistic in brackets. ***, ** and, * report the 1%, 5%, and 10% thresholds of significance.

	CAR[-1,1]		
Management Stake	0.00925	-0.0191	0.259**
	(0.44)	(-0.30)	(2.58)
Management Stake²		0.000599	-0.0139***
		(0.41)	(-3.32)
Management Stake³			0.000169***
			(3.72)
Amount Issued (log)	-0.0383	-0.0401	-0.0149
	(-0.14)	(-0.15)	(-0.06)
Maturity (log)	-0.196	-0.188	-0.273
	(-0.33)	(-0.32)	(-0.47)
Coupon (%)	-0.142	-0.125	-0.187
	(-0.76)	(-0.66)	(-1.02)
Sales (log)	-0.159	-0.157	-0.177
	(-0.98)	(-0.97)	(-1.16)
Market-to-Book	-0.182	-0.182	-0.191
	(-1.43)	(-1.43)	(-1.50)
Ebitda-to-Assets (%)	0.0649	0.0628	0.0767*
	(1.52)	(1.50)	(1.82)
Debt-to-Assets	-0.00112	-0.00199	0.00320
	(-0.08)	(-0.14)	(0.24)
Current Ratio	0.0987	0.105	0.109
	(0.53)	(0.57)	(0.61)
Constant	2.802	2.758	2.842
	(1.21)	(1.21)	(1.27)
N	349	349	349
Number of issuers (clusters)	258	258	258
R^2	0.0163	0.0177	0.0489

Table 9
Cumulative abnormal returns with sector indexes

The table presents cumulated abnormal returns (CARs) over 6 windows around the announce date (t=0). The market model is calibrated with sector indexes. Each firm stock return is regressed on the corresponding CSI sector index. Sectors are matched with Morgan Stanley's GICS classification. Significance is investigated through Student t-test with the cross sectional t-stat and Boehmer, Masumeci, and Poulsen's (BMP) statistic. We use a sign test to test the significance of median and report its p-value. ***, **, and * report the 1%, 5%, and 10% thresholds of significance.

	N	$\overline{CAR}$	Negative CAR (%)	θ^{CS}	T>$\lvert\theta^{CS}\rvert$	θ^{BMP}	T>$\lvert\theta^{BMP}\rvert$	P Sign test
Full Sample								
[0,0]	481	0.075	53.81	0.97	0.33	1.3	0.20	0.11
[-1,1]	481	0.299	51.56	2.16**	0.03	2.9***	0.00	0.52
[-2,2]	481	0.397	49.48	2.24**	0.03	2.51**	0.01	0.86
[-1,2]	481	0.361	50.31	2.31**	0.02	2.69***	0.01	0.93
[-2,1]	481	0.334	50.73	2.05**	0.04	2.59***	0.01	0.78
[-5,5]	481	0.538	48.02	2.01**	0.05	2.57**	0.01	0.41
SOE								
[0,0]	319	0.139	51.44	1.48	0.14	1.62	0.11	0.65
[-1,1]	319	0.382	48.90	2.43**	0.02	2.76***	0.01	0.74
[-2,2]	319	0.488	47.65	2.29**	0.02	2.2**	0.03	0.43
[-1,2]	319	0.508	47.02	2.79***	0.01	2.67***	0.01	0.31
[-2,1]	319	0.363	49.53	1.9*	0.06	2.17**	0.03	0.91
[-5,5]	319	0.795	46.39	2.68***	0.01	2.9***	0.00	0.22
Central SOE								
[0,0]	108	0.202	48.15	1.4	0.16	1.88*	0.06	0.77
[-1,1]	108	0.729	44.44	2.67***	0.01	2.81***	0.01	0.29
[-2,2]	108	0.814	39.81	2.42**	0.02	2.42**	0.02	0.04**
[-1,2]	108	0.901	43.52	3***	0.00	2.8***	0.01	0.21
[-2,1]	108	0.642	46.30	2.04**	0.04	2.38**	0.02	0.5
[-5,5]	108	1.248	42.59	2.22**	0.03	2.6**	0.01	0.15
Local SOE								
[0,0]	211	0.106	53.17	0.88	0.38	0.63	0.53	0.4
[-1,1]	211	0.205	51.18	1.07	0.29	1.13	0.26	0.78
[-2,2]	211	0.321	51.66	1.18	0.24	0.82	0.41	0.68
[-1,2]	211	0.306	48.82	1.34	0.18	1.08	0.28	0.78
[-2,1]	211	0.220	51.18	0.92	0.36	0.8	0.42	0.78
[-5,5]	211	0.563	48.34	1.63	0.10	1.55	0.12	0.68
Private firms								
[0,0]	162	-0.051	58.49	-0.38	0.71	-0.12	0.90	0.04**
[-1,1]	162	0.134	56.79	0.5	0.62	1.11	0.27	0.1*
[-2,2]	162	0.216	53.09	0.68	0.50	1.23	0.22	0.48
[-1,2]	162	0.072	56.79	0.24	0.81	0.85	0.40	0.1*
[-2,1]	162	0.278	53.09	0.9	0.37	1.42	0.16	0.48
[-5,5]	162	0.033	51.23	0.06	0.95	0.49	0.62	0.81

Table 10
Regression of cumulative abnormal returns with sector indexes

The table presents the regression of CAR[-1,1] calculated with sector indexes. Variances are clustered at the issuance level. The t-statistic is reported in parentheses, the F-statistic in brackets.

	CAR[-1,1]		
Central SOE	1.262**		
	(2.32)		
Government Stake	0.00306		
	(0.25)		
Government Stake²	-0.000524**		
	(-2.27)		
Top Shareholder		0.146	
		(0.77)	
Top Shareholder^2		-0.00803	
		(-1.49)	
Top Shareholder^3		0.0000785	
		(1.63)	
Herfindahl Ownership		0.00100	
		(0.66)	
Management Stake			0.255**
			(2.53)
Management Stake²			-0.0136***
			(-3.14)
Management Stake^3			0.000166***
			(3.50)
Amount Issued (log)	-0.0988	-0.325	-0.0891
	(-0.37)	(-0.66)	(-0.36)
Maturity (log)	0.00919	1.389	0.159
	(0.01)	(1.03)	(0.27)
Coupon (%)	-0.0479	-0.0662	-0.201
	(-0.22)	(-0.18)	(-1.03)
Sales (log)	-0.207	0.00797	-0.125
	(-1.17)	(0.03)	(-0.84)
Market-to-Book	-0.260**	-0.294*	-0.270**
	(-2.08)	(-1.75)	(-2.17)
Ebitda-to-Assets (%)	0.0808*	0.0572	0.0919**
	(1.70)	(0.80)	(2.16)
Debt-to-Assets	-0.00346	-0.0319	0.00860
	(-0.22)	(-1.30)	(0.64)
Current Ratio	0.101	0.0710	0.103
	(0.44)	(0.28)	(0.47)
Constant	2.818	1.370	2.187
	(1.14)	(0.30)	(0.92)
N	318	149	349
Number of issuers (clusters)	246	128	258
R^2	0.0425	0.0758	0.0516

Appendix
Description of the variables

Variable	Description	Source
Amount issued	Bond amount issued, in million renminbi (RMB).	Bloomberg Terminal
Coupon	Coupon of the bond, in percentage	Bloomberg Terminal
Current Ratio	Current assets reported to current liabilities of the company.	Bloomberg Terminal
Debt Payment	Dummy variable equals to one if the proceeds of the bonds are used for debt payment and zero otherwise.	Bloomberg Terminal
Debt to Assets	Total (short-term and long-term) debt of the company on its total assets. In percentage.	Bloomberg Terminal
Ebitda-to-Total-Assets	Earnings before interest, taxes, depreciation and amortization of the company on its total assets. In percentage.	Bloomberg Terminal
Government Stake	Percentage of shares holds by the state.	Bloomberg Terminal
Herfindahl Ownership	Sum of the squares of the percentages of shares hold by the 1st to the 20th shareholder of the company (from 0 to 10,000)	Bloomberg Terminal
Issue Price	Price of the bond issued, in percentage.	Bloomberg Terminal
Management Stake	Percentage of shares holds by the management of the firm.	Bloomberg Terminal
Market-to-Book	Stock value of the firm reported to the book value of its assets.	Bloomberg Terminal
Maturity	Original maturity of the bond, in years.	Bloomberg Terminal
Restrictive Covenant	Dummy variable equals to one if the issue include a covenant which limits the actions of the shareholders and zero otherwise.	Bloomberg Terminal
Sales	Total value of the sales of the company, in million RMB.	Bloomberg Terminal
Top Shareholder	Percentage of shares holds by the first shareholder of the firm.	Bloomberg Terminal
Total Assets	Total value of the assets of the company, in million RMB.	Bloomberg Terminal
Working Capital Funding	Dummy variable equals to one if the proceeds of the bonds are used to fund working capital and zero otherwise.	Bloomberg Terminal
SOE	Dummy variable equals to one if the firm is classified as a state-owned enterprise in the *CSI SOEs* index; equals to zero otherwise.	CSI Indexes
Central SOE	Dummy variable equals to one if the firm is classified as a central state-owned enterprise in the *CSI State-Owned* index; equals to zero otherwise.	CSI Indexes
Local SOE	Dummy variable equals to one if the firm is classified as a local state-owned enterprise in the *CSI L SOEs* index; equals to zero otherwise.	CSI Indexes
Private	Dummy variable equals to one if the firm is classified as a privately-owned enterprise in the *CSI POEs* index; equals to zero otherwise.	CSI Indexes

Chapter Four

Religiosity vs. Well-Being Effect on Investors' Behaviour

Abstract

Does religiosity impact the trading of securities in financial markets? We separate two channels that could affect investor behavior, disentangling a religiosity effect from a well-being effect. Our original identification strategy compares the stock market reaction to *sukuk* and bond issuance during the holy month of Ramadan, allowing for a differentiated stock market reaction to the religious component of a trade. Using the event study methodology, we measure abnormal returns for a sample of 2,140 issuances by 133 issuers in Malaysia over the period 2000-2013. While we find evidence for both channels, *sukuk* issuance during Ramadan is valued more positively than bond issuance by stock market investors. Further, the positive reaction to *sukuk* issuance during Ramadan only rewards firms which issue *sukuk* exclusively. Our findings support the view that religiosity influences the behavior of investors, suggesting that this factor should be taken into account in the analysis of financial markets.

JEL Codes: G14, P51.
Keywords: Behavioral finance, Religion, Islamic Finance, Ramadan effect.

1. Introduction[13]

Religion has long been considered an important factor shaping economic institutions (Stulz and Williamson, 2003), market outcomes (Kumar, Page and Spalt, 2011) and people's economic behavior (Guiso, Sapienza, and Zingales, 2003). Recent work also shows that religiosity exerts an impact on financial conduct, e.g., through the role of moral incentives in the repayment of contractual loans (Baele, Farooq, and Ongena (2014) and short-term facilities (Bursztyn et al., 2015).

The role of religiosity in financial markets—where the majority of traders are professional investors—is more uncertain. The literature suggests that investors are subject to psychological biases when making investment decisions (Daniel, Hirshleifer, and Teoh, 2002; Barberis and Thaler, 2003) and that trading experience reduces but does not eliminate behavioral biases in financial markets (Feng and Seasholes, 2005). However, religious bias in financial markets has not been investigated yet, due to the lack of information on trades that are motivated by religious beliefs and the difficulty to isolate them from other investments.

Our aim in this paper is to determine whether religiosity impacts the trading of securities in financial markets. In countries with both a conventional and an Islamic financial market, listed companies have the choice of issuing conventional bonds or *sukuk* to meet their large-scale financing needs. *Sukuk* are alternative modes of financing to conventional bonds that are compliant with the Islamic legal code. The religious content of *sukuk* makes them rather unique financial instruments to examine how religiosity influences the behavior of stock market investors.

To isolate a potential religious bias of investors in stock markets, we follow a twofold identification strategy. First, we compare the stock market reaction to *sukuk* issuance during and outside the holy month of Ramadan. This month is characterized by fasting, reading the Qur'an in its entirety, engaging in spirituality by intensifying prayers, and making donations to the needy. Further, the fast-breaking meal at the end of each day often takes place with a large number of family members and as such involves many interactions with fellow believers. Against this background, the month of Ramadan can influence individual views and beliefs by favoring religiosity, including financial decisions. Since Islam has specific prescriptions for financial ethics, Ramadan may thus foster religiosity which, in turn, leads investors to place more value on Islamic instruments.

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[13] This chapter has been written with Rima Turk and Laurent Weill and published in the *Journal of Economic Behavior & Organization, Volume 138, June 2017, Pages 50–62.*

However, Ramadan can also favor a different reaction from investors due to a well-being effect. This month of fasting can be associated with holidays and thereby generating a positive sentiment around its occurrence. Furthermore, the well-being of individuals may be enhanced during Ramadan because of a daily routine that includes pre-dawn and fast-breaking meals, which are social events combining family and friends (Campante and Yanagizawa-Drott, 2013).

Hence, our identification strategy should isolate the religious aspect of the Ramadan period from its "well-being" component. To that end, we compare the stock market reaction to *sukuk* and conventional bond issuance, which are two distinct financial instruments (Cakir and Raei, 2007; Godlewski, Turk-Ariss, and Weill, 2013), during Ramadan. The rationale is that the *difference* in the market reaction to *sukuk* and bonds issuance during the Ramadan can be attributed to the religious component of the *sukuk* instrument, after all relevant financial factors are taken into account. Hence, our identification strategy allows us to isolate the religious from the well-being factors affecting the trade.

To investigate the market impact of religiosity, we use an event study methodology using the Malaysian capital market as empirical fieldwork. Malaysia has by far the largest market for *sukuk*, gathering 86.8% of the industry size worldwide (KFUPM, 2016), the majority of which is issued by listed companies.[14] Moreover, Malaysia has the second deepest bond market in emerging countries relative to its GDP (Tendulkar, 2015). We examine the market reaction to *sukuk* and bond issuance between 2000 and 2013 by measuring the associated abnormal stock returns of the issuing companies, both during and outside Ramadan. Our main contribution is to isolate the religious component of traders' behavior. Through our identification strategy, we are able to provide evidence for a sizeable impact of religiosity on the stock market.

Our work has important implications for investors by providing information on the influence of religiosity on the behavior of market participants. It also examines the weight of religious aspects in Islamic finance and the ensuing fact that firms may strategically use financial instruments to select investors from a religious angle. Last, it informs on the ability of management to time the market when it comes to fixed income issuance, as the literature has shown that calendar effects can play a significant role in the firm's value.

[14] Based on our computations with Bloomberg data, 60% of corporate sukuk during the period of the study were issued by listed companies.

The remainder of the paper is organized as follows. The next section provides background to our research question. Section 3 discusses the dataset and the methodology. Section 4 contains the results. Section 5 concludes.

2. Background

Our study is at the intersection of two strands of literature: behavioral biases on financial markets and Islamic finance. We therefore review papers that have addressed both topics.

2.1. From Behavioral to Religious Biases

Behavioral finance postulates that people's beliefs challenge the efficiency of financial markets. There is a debate in the literature over the extent to which financial agents act in an irrational way. Building on persistent patterns in stock returns, Daniel, Hirshleifer, and Subrahmanyam (1998) and Daniel, Hirshleifer, and Subrahmanyam (2001) propose a model that accounts for market inefficiencies stemming from behavioral biases. Opposing this approach, Fama (1998) emphasizes the role of misinterpretations, data-mining, and model errors in the results backing market inefficiency. Subsequent papers fall short of explaining the roots of persistent over or underpricing. For instance, Kothari, Lewellen, and Warner (2006) find evidence supporting market efficiency, whereas Zhang (2006), Kumar (2009) support behavioural biases.

To overcome this deadlock, the literature progressively used more precise proxies for behavioural biases. Coval and Shumway (2005) investigate the behaviour of traders on the Chicago Board of Trade with trading-level data and report that traders recording losses in the morning take higher risk in the afternoon. Feng and Seasholes (2005) also find evidence of a disposition effect, i.e. the reluctance of investor to realize losses and the propensity to realize gains, a result that is however challenged by Ben-David and Hirshleifer (2012). Bailey, Kumar, and Ng (2011) document that funds investors suffer from important biases and can be described as "Gambler, Smart, Overconfident, Narrow Framer, and Mature".

Overall, the literature documents evidence of behavioural biases in financial markets. Looking for the roots of these biases, the role of culture and ultimately religion are often put forward. However, proxies for the religiosity of investors are usually not directly observable. For instance, Kumar, Page, and Spalt (2011) investigate the impact of religion on investors' behaviour through geography, using the share of Catholics and Protestants in the US states.

They do find that investors from states with relatively more Catholics invest more in lottery-type stocks and use more stock-options. However, their approach suffers from identification issues with a controversial geographical proxy, and the fact that religious and cultural effects can hardly be disentangled.

More recent papers address these issues using the framework of Islamic finance. Baele, Farooq, and Ongena (2014) link the religious prescriptions of Islamic finance with the rate of loan defaults in Pakistan. Comparing Islamic and conventional loans and using more precise geographical proxies, such as the political vote and the number of Islamic schools in neighbourhoods, they observe that religiosity reduces the default rate. Bursztyn et al. (2015) also conduct a field experiment on Islamic credit cards and show that religious incentives in the reminder of payments exert a strong impact on the refunding rate on short-term facilities.

Whereas there is nascent evidence in the literature of a religious bias in the repayment of retail loans, the role of religiosity on traders' behaviour is so far entangled with the influence of well-being. Several papers examined the returns of stock markets during Ramadan.

Seyyed, Abraham, and Al-Hajji (2005) study the volatility of stock returns in the Saudi Arabian stock market during 1985-2000 and find that market volatility is lower during Ramadan. Bialkowski, Etebari and Wiesniewski (2012) investigate stock returns during Ramadan for 14 countries with a predominant Muslim population over the period 1989-2007. They observe higher stock returns and reduced volatility during Ramadan in comparison with the rest of the year for their whole sample. The country-by-country analysis shows that 11 out of 14 countries have higher returns during Ramadan, including Malaysia. Bialkowski et al. (2013) also find that the performance of institutional fund managers in Turkey is substantially higher during Ramadan than in other months.

Turk-Ariss, Rezvanian, and Mehdian (2011) extend the analysis by testing for a month-of-the year and day-of-the-week effect on stock market returns in Gulf Cooperation Council countries over the period 1994-2008. In addition to Ramadan, they also consider the possible influence of months of the Gregorian calendar on stock returns. Moreover, they test for a Friday-type effect by considering potential anomalies for Wednesday in these countries, because Wednesday is the last day before the weekend on the main market of the region, the Saudi Arabian stock market. As a consequence, a Wednesday effect is not related to Islamic calendar anomalies but rather to investor optimism at the end of the work week. They find support for a Wednesday effect, which is less pronounced during the month of Ramadan. They also observe lower volatility of stock market returns during Ramadan.

Al-Khazali (2014) analyzes the Ramadan effect for the stock returns of 15 Muslim countries using a stochastic dominance approach over the period 1995-2012. He documents a positive Ramadan effect on stock returns in most countries, although its magnitude has been diminished with the financial crisis.

Halari et al. (2015) examine Islamic monthly anomalies on the Pakistani stock market, finding greater stock returns during four months including Ramadan but which are nonetheless not significant for most firms. However, they also document significantly lower stock volatility during two months including Ramadan, concluding that Ramadan is the best month for an investor to make a risk-adjusted profit.

Hence, the literature concurs that returns on stock markets are different during the month of Ramadan. However, these anomalies cannot necessarily be linked to religion but may derive from the well-being of investors, similar to the findings for Western countries where calendar anomalies are well-documented and which have nothing to deal with religiosity.[15] Henceforth, we offer an identification strategy to extract any religious component in the stock market using both the Ramadan period as well as financial instruments in Islamic and conventional finance.

2.2. Islamic Finance and Sukuk

Islamic finance can be defined as finance that conforms to Islamic law (*sharia*), which imposes several requirements on financial contracts. The main precept is the prohibition of interest in all financial transactions which, however, does not imply that capital is not rewarded. Rather, interest is replaced by profit-and-loss sharing, where both parties in a financial transaction share the returns from an investment. Another aspect of Islamic finance is the prohibition of activities considered as sinful by *sharia*, including investment in alcohol, pork, cigarettes, military, and entertainment (Kammer et al., 2015; Hussain, Shahmoradi, and Turk-Ariss, 2015).

There has been a strong expansion of Islamic financial activities in the recent years. According to TheCityUK (2015), Islamic financial assets have reached $2.2 trillion end 2015, and have tripled since 2007. While the vast majority (80%) of these assets is accounted for by Islamic banks, *sukuk* represent about 15%. *Sukuk* are alternative modes of financing to conventional bonds that are compliant with *sharia*. They are investment certificates issued by sovereigns and corporations that combine similarities and differences with conventional bonds.

[15] For instance, January and end-of-the-week effects. See Gultekin and Gultekin (1983), Jaffe and Westerfield (1985) and Ariel (1987) for seminal references.

Like bonds, *sukuk* have a maturity date and their holders expect to receive a regular stream of income including capital refunding at the end of the investment horizon. These similarities can explain why some scholars consider that *sukuk* are not different instruments than conventional bonds (e.g., Miller, Challoner and Atta, 2007, and Wilson, 2008).

Unlike bonds, however, the value of *sukuk* may be either based on the creditworthiness of the issuer or rely solely on the value of the underlying project. *Sukuk* certificates correspond ownership rights in tangible assets, usufruct, or services of revenue-generating issuers, with the underlying asset being *shari'a*-compliant. In a typical *sukuk* structure, a special purpose vehicle (SPV) buys the assets underlying the firm's investment project by raising funds from investors who receive ownership certificates. These certificates entitle the holders a regular stream of cash-flows and capital redemption at maturity. The project is managed by the issuer who can buy the underlying assets back. The aim of this structure is to transfer ownership of the underlying assets to the investors, thereby rendering the *sukuk* in conformity with the sharia.

Sukuk can be structured as debt-based instruments or partnership contracts. Debt-based instruments such as *ijara* (rental/lease agreement) and *murabaha* (cost-plus sale) do not contain stricto sensu interest but they pay a predetermined rate of return to investors. *Musharaka* and *mudaraba* are partnership contracts in which the provider of funds and the issuing company share profits based on pre-agreed ratios. Losses are commensurate to the contribution to the partnership in the case of the *musharaka* and otherwise entirely supported by the investors in the case of the *mudaraba*.

The large expansion of *sukuk* in the last decade raises questions about the impact of *sukuk* issuance for the issuing firm. In particular, the influence of *sukuk* financing on firm valuation is important to appraise the expansion of this nascent type of financing, as a more positive stock market reaction to *sukuk* issuance favors the choice of this financing instrument relative to bonds. Two studies provide evidence on the comparative stock market reaction to the announcements of both *sukuk* and conventional bonds.

Godlewski, Turk-Ariss, and Weill (2013) find that, in Malaysia, the stock market is neutral to the announcement of conventional bonds but investors react negatively to the announcement of *sukuk*, notwithstanding excess demand from Islamic financial institutions that makes it easier to sell these instruments. The negative implications of *sukuk* issues are attributed to possible adverse selection considerations, as borrowers with the lowest return expectations may favor the issuance of profit-and-loss sharing *sukuk* structures over conventional interest-based bonds.

Using a sample of *sukuk* issues across eight countries, Godlewski, Turk-Ariss, and Weill (2016) take the analysis a step further by examining whether the *sukuk* type and characteristics of *shari'a* scholars (advisors who certify *shari'a* compliance of *sukuk*) influence the stock market reaction to issuances. They find that both the choice of *sukuk* structure and scholars hired for its certification influence the stock market reaction to issuances.

Thus, existing papers provide evidence of a different stock market reaction to *sukuk* and bond issuance, as well as a role for *sukuk* characteristics. This conclusion opens the possibility that *sukuk* and bond issuances are impacted differently by some features. It therefore appears of interest to investigate whether the religiosity of investors can exert a role in the reaction to *sukuk* issuance.

3. Empirical Strategy

3.1. Data

We use data on bonds and *sukuk* issued by listed companies in Malaysia between 2000 and 2013. Malaysia was successful in developing both bond and *sukuk* markets, with the *sukuk* outstanding amount representing 54% of the total bonds outstanding in 2015.[16] It is important to stress that the *sukuk* market in Malaysia is characterized by an overwhelming amount of debt-based *sukuk*: *murabaha* and *ijara sukuk* account respectively for 66% and 7% of total *sukuk* in 2015, whereas the shares of *musharaka* and *wakala sukuk* are 12% and 10%, respectively. The remaining 5% is a combination of different contracts.

We retrieve data come from the Bloomberg Professional Server, considering only public straight debt issuances and removing hybrid securities. We obtain a preliminary sample of 5,706 issuances, of which 3,000 are *sukuk* issuances. Our final sample size is determined by data availability and methodology considerations. First, we only keep issuances for which the issuer has minimum financial records, dropping issuers who lack information on total assets, book value of debt, sales, and earnings for the year of the issuance. For the market analysis, we need stock pricing over 171 days before and 21 days after security issuance, so that we remove issuers without enough stock market data. To prevent any overlapping between events, we also remove issuances from the same issuer that occur within 10 working

[16] Information provided by the Securities Commission website: http://www.sc.com.my/data-statistics/islamic-capital-market-statistics. Last view 17/05/2016.

days. Last, since we need to distinguish clearly between bond and *sukuk* issuances as part of our identification strategy, we remove issuances by the same firm of both types of securities that occur on the same day.

Our final sample includes 2,140 issuances by 133 corporate issuers. More precisely, 83 listed Malaysian firms issued *sukuk* and 79 issued bonds, with some firms issuing both types of securities. We identify issuances occurring during the month of Ramadan, by collecting the dates of Ramadan in Malaysia since 2000, relying on Malaysian official records.[17]

Table 1 describes the sample distribution across the Ramadan period, years, and sectors of economic activity. We observe 96 bond issues and 111 *sukuk* issues during Ramadan, compared with 935 bond issues and 998 *sukuk* issues, respectively, for the full sample. Hence, the proportion of issues during Ramadan is proportional to the length of this period for bonds (40 days out of 365), whereas there is proportionally slightly more issues of *sukuk* during Ramadan than during the rest of the year.

The number of issuances has steadily increased since the year 2000, but this trend was reversed with the global financial crisis, and the market has not returned to the pre-crisis level of issuances reached in 2007. The majority of securities issuances are by companies in the industrial sector followed by banks, but firms engaged in the consumer segment are also significant players in the market.

Table 2 reports descriptive statistics for the characteristics of issuances and issuers. We keep all debt maturities in our sample, resulting in an important dispersion in the sample. We observe that there are significant differences between bonds and *sukuk*, suggesting that these two instruments may be different. Bond issuances are larger, on average, than *sukuk* issuances and they pay slightly lower coupon rate over a shorter maturity period. However, there is no statistical difference in the size of both types of issuers who appear to be of similar size. Bond issuers have more leverage and higher profitability than *sukuk* issuers. In the multivariate analysis, we take into account the different features of issuers and issues.

3.2. Methodology

To investigate the impact of Ramadan on *sukuk*, we perform an event study on the stock market reaction around *sukuk* and bond issuance. We adopt the standard event study methodology as described by MacKinlay (1997) to compute abnormal returns (AR) around the issue date.

[17] The identification of the Ramadan period rests on the lunar calendar and it starts by approximately 10 days earlier each year (http://www.islam.gov.my/en/node/26745).

We first estimate expected returns from a market model, such as:

$$R_{n,t} = \alpha_i + \beta_n . R_{m,t} + \varepsilon_{n,t} \quad (1)$$

$R_{n,t}$ is the daily return of the share price of the company n the day t, and is computed as $R_{n,t} = \frac{P_{n,t} - P_{n,t-1}}{P_{n,t-1}}$, where $P_{n,t}$ is the closing price. $R_{m,t}$ is the market return and $\varepsilon_{n,t}$ is the abnormal return over the estimation period, with $E[\varepsilon_{n,t}] = 0$ and $Var[\varepsilon_{n,t}] = \sigma_i^2$.

We collect data on four main indices which may be used to calculate market returns in Malaysia.[18] We choose the index with the highest R^2, namely the FTSE Bursa Malaysia Emas Index (FBMEMAS), which is a weighted index of large and mid-cap companies.

We use an estimation period of -171 days to -21 working days before the *sukuk* or bond issuance to prevent any impact or contamination from the current issuance. This also allows us to systematically compute expected returns outside the Ramadan period (which lasts 29 days on average).

Next, we compute abnormal returns as follows:

$$AR_{n,t} = R_{n,t} - E\left[R_{n,t}\right] \quad (2)$$

Where the expected return $E[R_{n,t}]$ is calculated from the market model in the main analysis as:

$$E\left[R_{n,t}\right] = \widehat{\alpha_n} + \widehat{\beta_n} . R_{m,t} \quad (3)$$

We allow the market to anticipate the event and to take one more day to fully integrate its impact. Hence, we consider the day before and after the event too, corresponding to a [-1,1] window.

We then compute Cumulative Abnormal Returns (*CAR*s) as:

$$CAR_n(\tau_1, \tau_2) = \sum_{t=\tau_1}^{\tau_2} AR_{n,t} \quad (4)$$

With $\tau_1$the first day of the window and $\tau_2$the last day. We also calculate the average *CAR* across companies as:

$$\overline{CAR}(\tau_1, \tau_2) = \frac{1}{N} \sum_{n=1}^{N} CAR_n(\tau_1, \tau_2) \quad (5)$$

To assess the significance of *AR*s and *CAR*s we perform three complementary tests. First, we conduct a cross-sectional t-test (t^{CS}) which considers only the variance within the event windows:

$$t^{CS}_{(\tau_1,\tau_2)} = \frac{\overline{CAR}(\tau_1,\tau_2)}{\sqrt{[\frac{1}{N-1}\sum_{i=1}^{N}(\overline{CAR}_i(\tau_1,\tau_2) - \overline{CAR}(\tau_1,\tau_2))]^2}} \quad (6)$$

[18] Namely, the MSCI Malaysia Index (MSDLMAF), the FTSE Bursa Malaysia Top 100 Index (FBM100), the FTSE Bursa Malaysia KLCI Index (FBMKLCI) and the FTSE Bursa Malaysia Emas Index (FBMEMAS). A popular index is also the FTSE Bursa Malaysia Emas Sharia Index (FBMS) including *shar'ia*-compliant firms only. However we do not consider this last index since we want a religious-neutral index for both *sukuk* and bond issuers.

The cross-sectional statistic is most suited to investigate calendar anomalies. Notably, Bialkowski et al. (2012) use it to find that volatility is lower during Ramadan. The reason is that the cross-sectional t-test takes into account a potential change in the variance of returns between the estimation and the observation period.

As an alternative statistic, we compute the Boehmer, Masumeci, and Poulsen (1991) statistic (t^{BMP}), which considers the variance of stock returns both outside and within the observation period. To this end, we first calculate the variance of *AR*s over the estimation period ($\sigma^2_{i,\varepsilon^e}$). Then, each *CAR* is standardized by the variance of the estimation period, resulting in standardized cumulative abnormal returns (*SCAR*) as follows:

$$SCAR_i(\tau_1,\tau_2) = \frac{CAR_i(\tau_1,\tau_2)}{\sqrt{(\tau_2-\tau_1+1).\sigma^2_{i,\varepsilon^e}}} \quad (7)$$

Next, the t^{BMP} statistic is obtained by dividing the cross-sectional average *SCAR* by its cross-sectional standard deviation during the event period:

$$t^{BMP}_{(\tau_1,\tau_2)} = \frac{\frac{1}{N}\sum_{i=1}^{N} SCAR_i(\tau_1,\tau_2)}{\sqrt{[\frac{1}{N-1}\sum_{i=1}^{N}(SCAR_i(\tau_1,\tau_2)-\frac{1}{N}\sum_{i=1}^{N} SCAR_i(\tau_1,\tau_2))]^2}} \quad (8)$$

Last, CARs are often characterized by an important dispersion with extreme reactions. We perform a sign test over the percentage of negative CARs to be sure that those reactions do not drive our findings.

In a second part, we aim to isolate the impact of Ramadan on stock market reaction to issuances. We perform OLS regressions using CARs over the [-1,1] event window as the dependent variable. Our key explanatory variable is *Ramadan*, which is a dummy variable set to one if the issue takes place during Ramadan and zero otherwise. We also interact this variable with the dummy variable *Sukuk,* which is equal to one if the issuance is a *Sukuk* and zero otherwise. Hence, we are able to isolate the effects of Ramadan on the stock market reaction.

We capture the religiosity effect in regressions that include *Sukuk*, *Ramadan*, *and Sukuk×Ramadan* as right-hand side variables. The coefficient on *Sukuk* depicts the general differential stock market reaction to *sukuk* issuance relative to bond issuance. A significant coefficient for *Ramadan* would imply that this month has an influence of the stock market reaction following issuances of bonds only. Indeed, if *Sukuk* is equal to 1, the effect of issuing a *Sukuk* during Ramadan is depicted by the interaction term *Sukuk×Ramadan.* If the issue is a bond, the interaction term is equal to zero and the variable *Ramadan* illustrates the effect of issuing a bond during Ramadan. Last, the interaction *Sukuk×Ramadan* corresponds to the specific stock market reaction following *sukuk* issuance relative to bond issuance during

Ramadan. In other words the coefficient on *Sukuk×Ramadan* considers the impact of the religiosity of investors on the *sukuk*, which is the key dimension that we investigate in this paper. The total impact of issuing a *sukuk during* Ramadan on the stock market is the sum of the coefficients on *Sukuk, Ramadan,* and for *Sukuk×Ramadan.*

To control for other determinants of CARs, we also include issuance and issuer characteristics. We select two issuance characteristics: the amount of issuance in USD measured in log (*Amount*), and the maturity of the issuance in years (*Maturity*). We also consider five issuer characteristics: issuer size defined by the log of sales (*Size*), *Market-to-Book*, *Leverage* as the ratio of total debt to total assets, *Current Ratio* as the ratio of current assets to current liabilities, and *Profitability* measured as the ratio of earnings before interest and taxes (Ebitda) to total assets. We include year fixed effects and industry fixed effects.

4. Results

We first display the univariate results, followed by the multivariate estimations. We then provide additional investigation by considering separately unique and multiple issuers before concluding with robustness checks.

4.1. Abnormal Returns during Ramadan

Table 3 displays univariate results. We report summary statistics on *CAR*s around security issuances of *sukuk* and bonds, also distinguishing among issuances taking place during or outside Ramadan.

We first point out the absence of a Ramadan effect as a whole for all security issuances. Our univariate results do not provide evidence for a significantly different stock market reaction to security issuance during the month of Ramadan relative to other months of the year.

We also find that *sukuk* issuance generates a negative stock market reaction that is significant using the cross-sectional statistic when the issuance takes place outside Ramadan. However, the market reaction is insignificant when the issuance occurs during Ramadan. This first result is of interest because it tends to show a Ramadan effect for *sukuk*. This calendar effect may have several explanations at this point. First, issues during Ramadan may be of higher quality for shareholders. This argument calls for a multivariate analysis controlling for the characteristics of issues and issuers. Second, a Ramadan effect may also stem from behavioral biases. This period may be more pleasant for shareholders because it corresponds

to a period of celebration, with numerous public holidays and social interactions. Alternatively, a greater religiosity during that month may contribute to improve the perception of issuers using financial instruments that are compliant with *sharia*. So far, we cannot disentangle these effects and need to dig deeper in our investigations.

Next, we observe that CARs following bond issuance are significantly negative for issuances taking place during Ramadan, while they are not significant for issuances outside Ramadan. This significance observed using the cross-sectional statistic may yield three explanations. It could be that issues are of poorer quality during Ramadan, which is a period with fewer trading days. Alternatively, this period may be more stressful for shareholders, as people may be more irascible, have frequent headaches, and suffer from sleep deprivation due to night rest interruption for a snack before dawn when the fasting begins (Leiper and Molla, 2003). Last, greater religiosity during that month may contribute to deteriorating the perception of issuers of financial instruments that are noncompliant with *sharia.*

Therefore, the univariate analysis shows evidence of a Ramadan effect for bond and *sukuk* issuances in opposite directions. The stock market reaction deteriorates for bond issuance, but it improves following *sukuk* issuance as the occurrence of Ramadan cancels the negative impact of *sukuk* issuance during other months. The fact that the effect of Ramadan is opposite for bonds and *sukuk* adds some weight to the religious interpretation of financial market reaction. A priori, there is no *financial* reason explaining why managers choose to issue bond of poor quality and *sukuk* of high quality during Ramadan. Similarly, there is no reason explaining a difference in the well-being effect between the two securities during Ramadan. So far, these findings suggest that religiosity during Ramadan bears an influence that leads investors to favour *sukuk* issues and dismiss bond issues. We explore this hypothesis further in a multivariate analysis framework.

4.2. Multivariate Estimations

Table 4 reports multivariate results for the Ramadan effect. We perform several regressions of CARs. We first include the single effect of *Sukuk* without considering the Ramadan period, controlling for a set of variables (Column 1). We then investigate the Ramadan effect as a whole by including *Ramadan* and the same control variables (Column 2). The remaining estimations consider together the three dummy variables *Sukuk*, *Ramadan*, and *Sukuk*×*Ramadan* to provide information on a Ramadan effect for *sukuk* issuance, and testing for three different specifications to examine how the set of control variables can influence the results. Column 3 includes no control variable, column 4 considers only issuance variables, and column 5 has all issuance and issuer controls.

In the first column, we find no significant coefficient for *Sukuk*, meaning that no significant difference in stock market reaction is observed following *sukuk* issuance relative to bond issuance. This result differs from the conclusion of a negative stock market reaction found by Godlewski, Turk-Ariss and Weill (2013), which could be explained by the use of more recent data in our sample going until 2013 while theirs stopped in 2009. The development of *sukuk* markets may have influenced their perception by stock market investors.

When testing for the presence of a Ramadan effect for all security issuances in column 2, we do not find a significant coefficient for *Ramadan* either. Hence we confirm the univariate results of the absence of a Ramadan effect for security issuances in general.

We then turn to the key part of the estimations by analyzing the Ramadan effect for *sukuk* issuances in the last three columns of the table. We observe that the coefficient on Ramadan is negative and significant when considering the effect of *sukuk*. At the same time, the coefficient on the interaction term *Sukuk×Ramadan* is positive and significant.

As we include the dummy variable for *sukuk* issuance and the interaction term between *sukuk* issuance and Ramadan issuance, the coefficient for *Ramadan* informs on the impact of a bond issuance during Ramadan. Hence, the negative coefficient for *Ramadan* means that bond issuance during the month of Ramadan generates a negative stock market reaction relative to bond issuances taking place during the rest of the year.

The positive and significant coefficient for *Sukuk×Ramadan* informs on the difference in the market reaction to bond and *sukuk* issued during Ramadan. We find that *sukuk* issuance during Ramadan is valued more positively than bond issuance by stock market investors. Since we control for issue and issuer characteristics and consider the overall *sukuk* effect with the dummy variable *Sukuk*, the difference between bond and *sukuk* during Ramadan can be affected to the sole effect of religiosity on investor reaction during that period.

This result is a key finding because it shows that some part of traders' behavior is determined by religious considerations. The religious component of the shareholders' reaction (*Sukuk×Ramadan*) is also significant from an economic standpoint, since it represents an abnormal return of 1.6%, which is substantial for the issuing firm. Using the mean capitalization of companies issuing *sukuk* during Ramadan, the religious component of the trade represents USD 9.876 million of stock value in abnormal return due to religiosity. In a similar fashion, issuing *sukuk* during Ramadan instead of outside Ramadan would generate an

additional USD 11.576 million of stock value.[19] Therefore, not only has religiosity an impact on traders' behavior, but its impact is also economically significant.

What is the overall impact of issuing *sukuk* during Ramadan? The *F*-test of the sum of the coefficients for *Sukuk, Ramadan* and *Sukuk×Ramadan* is not significant. In other words, to issue *sukuk* during Ramadan does not have a significant impact on stock market reaction. *Sukuk* seem to benefit from shareholders' religiosity, which outweighs the negative effect observed for bonds during Ramadan. This is confirmed by the sum of the coefficients on *Ramadan* and *Sukuk×Ramadan,* which is positive and significant: adding only the religious part of the reaction to the general reaction to *sukuk* issues yields a positive reaction.

How to explain this negative effect for bonds issues occurring during Ramadan? The coefficient *Ramadan* only represents the reaction to bonds during Ramadan and does not compare this effect with *sukuk* issues. Hence, two competitive hypotheses arise as this effect may be attributed to both a well-being effect and a religious effect. First, shareholders may be stressed by the Ramadan period, reducing their well-being and leading to a negative reaction. Second, shareholders may sanction firms which choose to issue bonds, i.e. to use a security which contradicts with the *sharia* during a holy period. Since we cannot disentangle this religious and well-being effect for bonds, we allow for the possibility that the two effects exert a role on shareholders' reaction.

In a nutshell, bonds and *sukuk* generate a different reaction during Ramadan. Shareholders react negatively to bonds during Ramadan, whereas they do not have any reaction to *sukuk* in general. As for the significant difference in reaction between bond and *sukuk* during the Ramadan, it can be attributed to shareholders' religiosity. Traders value the religious component of *sukuk* with a sizeable abnormal return, but they may punish bond issuers for the issuance of interest-based securities.

4.3. Unique vs. Multiple Issuers

When considering potential reward from issuing religion-based securities and punishment from dealing with interest-based debt securities, it is of interest to explore what happens to firms that issue solely *sukuk* or bonds compared with those that tap both markets. In line with the reward/punishment interpretation, the reaction of stock market investors can be influenced by the usual behavior of issuers. The reward should be higher for firms that commit to the *sukuk* market solely. Conversely, firms that usually tap both markets may be not impacted by the religiosity of shareholders. The reason is that the expectations of

[19] For comparison, Malaysia had a market capitalization of roughly USD 500bn in 2013 (World Bank Data Base) http://data.worldbank.org/indicator/CM.MKT.LCAP.CD/countries.

investors are not the same for both situations. Investors expect a *sukuk*-only issuing firm to commit to the *sukuk* market and they may reward it for its commitment, unlike for firms that usually tap both markets. To investigate this hypothesis, we distinguish between unique issuers, or firms that have only issued one type of securities until the concerned issue, and multiple issuers, i.e. firms that have issued both types of securities in the past.

Table 5 displays the estimations considering separately single issuers and multiple issuers. For each category of issuers, we provide results with three alternative sets of explanatory variables: the three key variables (*Sukuk*, *Ramadan*, *Sukuk×Ramadan*) only, the three key variables and the issuance variables, and the three key variables alongside all control variables.

The most striking result is that our main findings of a significantly negative coefficient for *Ramadan* and a significantly positive coefficient for *Sukuk×Ramadan* are maintained for single issuers only. Namely, both these variables are not significant for multiple issuers. In other words, our key finding that bonds and *sukuk* generate a different reaction during Ramadan only stands for single issuers.

Shareholders react positively to *sukuk* issuance during Ramadan only if the issuer has loyally issued solely *sukuk* in the past. Hence, this abnormal return can be directly seen as a reward for firms' commitment to *sukuk* issuances. In contrast, the estimations show that no specific market reaction occurs for multiple issuers during the month of Ramadan. This result comforts the idea that investors of firms that do not select only one market but tap indifferently both the *sukuk* and bond markets do not take into account the religious part of the security.

4.4. Robustness Checks

We check the robustness of our results in different tests reported in Table 6, considering the full set of explanatory variables for all tests.

First, we use an alternative event window for cumulative abnormal returns. We redo our estimations by considering one day before the event and the day of the event solely. This corresponds to the [-1,0] event window instead of the [-1,1] event window in the main estimations. We observe that the interaction term *Sukuk×Ramadan* is still positive and significant. However *Ramadan* is no longer significant. Hence, we still observe a significant difference between bond and *sukuk* during Ramadan, with a positive impact from *sukuk* and no significant influence from bonds.

Second, we use a modified model instead of the market model. Since our sample is characterized by numerous issuances from few firms, the market model can be misspecified if

the estimation period includes too many events (Brown and Warner, 1985). In this case, the expected return is equal to the market return. We find that *Ramadan* is not significant and that the interaction term *Sukuk*×*Ramadan* is no longer significant albeit remaining positive.

Third, we use an alternative market index to compute stock market returns. We replace the FBMEMAS by the FBM100, which is the market index with the highest R^2 after the FBEMAS among the four main indices for which we collected data. Our main findings are maintained. We observe a significantly negative coefficient for *Ramadan* and a significantly positive coefficient for *Sukuk*×*Ramadan*. Hence the results confirm a negative influence of Ramadan for bond issuances and a positive one for *sukuk* issuances on stock markets.

Fourth, we analyze the potential role of the financial crisis on the results. Al-Khazali (2014) observed that the religiosity effect diminished during the financial crisis. Therefore we can question whether the results are influenced by the occurrence of the crisis. To this end, we add a dummy variable *Crisis* equal to one if the year of the issuance is 2008 or 2009 and zero otherwise, and an interaction term *Sukuk*×*Ramadan*×*Crisis* to isolate a potential specific religiosity effect during the crisis. With this alternative specification, our main results still hold with a significantly negative coefficient for *Ramadan* and a significantly positive coefficient for *Sukuk*×*Ramadan*. At the same time, we observe that the interaction term *Sukuk*×*Ramadan*×*Crisis* is not significant. As a result, we conclude that the financial crisis had no impact on the results.

5. Conclusion

This paper investigates whether a religious bias may affect trades on a stock market. We develop an identification strategy that isolates the potential religious component of a trade, examining how the month of Ramadan can affect the stock market reaction following the issuance of *sukuk* relative to conventional bonds. We use an event study methodology for the largest corporate *sukuk* market in the world in Malaysia, which is also active in conventional bond issuance.

Ramadan provides a framework of prime interest to investigate the behavior of traders because it fosters religiosity with the greater incentives for spirituality during that month. It can consequently exert an influence on the perception of *sukuk* which are in line with Islamic precepts. However, the Ramadan period may also exert a role on investors' well-being, as it corresponds to a period of festivity. We isolate the religious component during Ramadan by comparing the stock market reaction to *sukuk* issues to the reaction to conventional bonds issues.

We find support for an impact of religiosity on stock returns. Univariate results show that cumulative abnormal returns are not significant when a *sukuk* issuance takes place during Ramadan, while they are negative when issuance occurs during the rest of the year. Hence, there is a positive effect of the month of Ramadan on stock returns following a *sukuk* issue. This result is of particular interest as the abnormal returns during the month of Ramadan are negative for bond issues.

Multivariate results show that Ramadan exerts a positive stock market reaction for *sukuk* relative to bonds. The difference of reaction between both securities during the month of Ramadan can then be attributed to the religious component of *sukuk*. In contrast, bond issues during Ramadan are followed by a negative stock reaction. This reaction can either be attributed to a negative well-being effect or a punishment for firms issuing an interest-based security during a holy period.

To check if the reaction following *sukuk* or bond issues during Ramadan corresponds to reward or punishment, we conduct further investigation based on the past behavior of the issuing firm. We compare firms which commit to issuing one type of security with firms which issue both instruments, *sukuk* and bonds. We find that investors react positively to *sukuk* issuance during Ramadan only if the issuer has loyally issued only *sukuk* in the past. If the issuer usually taps both markets, there is no religious bias in the reaction of traders to the *sukuk* issue.

Our findings support the view that religiosity can influence the behavior of investors. This result confirms that psychological biases affect the value of financial securities. Moreover, our identification strategy does not rely on a proxy of religion but directly assesses the religious component of a trade. Second, we also show that one major difference between *sukuk* and bonds lies in the religious nature of these instruments in the eyes of the investors. As a consequence, managers may be able to strategically choose to issue *sukuk* or conventional bonds to attract a class of investors. Last, we also show that managers should carefully select the timing of security issuance, as it has a substantial impact on firm value. Depending if they anticipate a reward process from investors or not, they could select the month of Ramadan to issue *sukuk* or stick to other months to issue bonds.

This paper opens avenues for further research. It represents a first investigation on how calendar anomalies can influence stock market reaction following security issuance. Future work could examine the effect of Islamic religious events for other countries, as well as other calendar anomalies like day-of-the-week or month-of-the-year effect in the Gregorian calendar for security issuances.

Table 1
Sample Distribution of Issues across Period, Years, and Industries

The table gives the composition of the sample by day, year, and industry. The sample is composed of 133 issuers with 83 firms having issued *Sukuk* and 79 firms having issued bonds (some firms issue both securities).

	Bond Issues	Sukuk Issues
Period		
During Ramadan	96	111
Outside of Ramadan	935	998
Years		
2000	12	3
2001	16	4
2002	7	5
2003	10	12
2004	86	92
2005	110	131
2006	134	213
2007	161	215
2008	132	186
2009	116	80
2010	107	56
2011	65	63
2012	36	34
2013	39	15
Industries		
Basic Materials	74	87
Communications	44	22
Consumer, Cyclical	184	169
Consumer, Non-cyclical	135	249
Diversified	47	7
Energy	5	4
Financial	233	180
Industrial	274	379
Utilities	35	12
Total	1031	1109

Table 2
Descriptive Statistics by Security Type and by Issuer

The table presents issuances and issuers' characteristics, distinguishing bond and *sukuk* issuances. All variables are in million USD with the exception of maturity (months), issue price (%), coupon (%) and financial ratios (%). The stars denote the significance of t-test difference (mean) and Kruskall-Wallis median test between bond and *sukuk* (*p<0.1, **p<0.05, ***p<0.01).

	N	Mean	Median	Std. Dev.	Minimum	Maximum
Issuances						
Bond Issues						
Amount	1031	28.1**	10.5***	111	0.3	2200
Issue price	418	98.3***	99.1***	6.9	13.9	100
Coupon	1031	0.6	0	1.8	0.0	9
Maturity	1031	0.8*	0.2*	1.9	0.0	18
Sukuk Issues						
Amount	1109	20.3**	7***	56.9	0.5	854
Issue price	588	99.2***	99.5***	1.3	74.3	102
Coupon	1109	0.7	0	1.9	0.0	9
Maturity	1109	1*	1.5*	2.3	0.0	22
Issuers						
Bond Issuers						
Size	223	687	170.6	1261.2	2.3	6499
Market-to-Book	223	1.4	0.9	2.4	-0.2	28
Leverage	223	36.5**	34	13.4	0.5	72
Current ratio	223	1.7	1.3**	1.3	0.0	12
Profitability	223	9.1*	8	7.2	-12.1	46
Sukuk Issuers						
Size	256	815.2	186.9	1808.8	4.1	15319
Market-to-Book	256	1.3	0.9	1.0	-0.1	7
Leverage	256	33.9**	32.2	13.2	1.6	80
Current ratio	256	1.9	1.5**	1.4	0.2	12
Profitability	256	8.1*	7.8	5.4	-18.0	25

Table 3
Cumulative Abnormal Returns

The table presents cumulative abnormal returns (CARs) around issuance announcement by issuance type. CARs are presented in percentage points. We use a market model with an estimation period lasting from -171 to -21 days before the issuance. We report cross-sectional *t* (t_{CS}) and Boehmer, Masumeci, and Poulsen (1991)'s *t* (t_{BMP}). For the percentage of negative observations, we perform a sign test. Stars denote significance (*p<0.1, **p<0.05, ***p<0.01).

	N	CAR	t_{CS}	T>| t_{CS} |	t_{BMP}	T>| t_{BMP} |	Negative (%)
Window [-1,1]							
Full Sample	2140	-0.19	-1.84*	0.07	-0.38	0.71	54.22***
During Ramadan	207	-0.37	-0.88	0.38	-0.68	0.5	56.99*
Outside of Ramadan	1933	-0.18	-1.63	0.1	-0.23	0.82	53.93***
Sukuk	1109	-0.22	-1.59	0.11	-0.56	0.57	56.2***
Sukuk Ramadan	111	0.23	0.41	0.69	0.01	0.99	62.04**
Sukuk Not Ramadan	998	-0.27	-1.93*	0.05	-0.58	0.56	55.54***
Bond	1031	-0.16	-1.03	0.3	0.13	0.9	52.02
Bond Ramadan	96	-1.07	-1.72*	0.09	-1.17	0.25	50.59
Bond Not Ramadan	935	-0.07	-0.43	0.66	0.41	0.68	52.16

Table 4
Main Estimations

The table presents the regression results where cumulative abnormal returns is the dependent variable. The key explanatory variables are *Sukuk* (which takes the value one if the issuance is a *sukuk*), *Ramadan* (equal to one if the issuance is during Ramadan), and their interaction *Sukuk*Ramadan*. The regression also includes issuance and issuer characteristics. Dummy variables for sectors and years are included but not reported. The variances are clustered at the issuer level. T-values are in parentheses and stars denote the significance (*p<0.1, **p<0.05, ***p<0.01).

	(1)	(2)	(3)	(4)	(5)
Sukuk	-0.015		-0.122	-0.095	-0.163
	(-0.06)		(-0.59)	(-0.46)	(-0.72)
Ramadan		-0.199	-1.062*	-1.076*	-1.061*
		(-0.51)	(-1.80)	(-1.84)	(-1.80)
Sukuk×Ramadan			1.601**	1.618**	1.606**
			(2.17)	(2.21)	(2.20)
Amount	-0.023	-0.022		0.045	-0.014
	(-0.20)	(-0.20)		(0.44)	(-0.13)
Maturity	-0.049	-0.050		-0.054	-0.053
	(-1.49)	(-1.48)		(-1.60)	(-1.60)
Size	0.171	0.171			0.169
	(1.63)	(1.64)			(1.61)
Market-to-Book	0.006	0.005			0.002
	(0.11)	(0.08)			(0.03)
Leverage	-0.010	-0.010			-0.010
	(-0.75)	(-0.75)			(-0.75)
Current ratio	0.192***	0.191***			0.192***
	(3.87)	(3.72)			(3.89)
Profitability	0.047	0.047			0.047
	(1.43)	(1.49)			(1.44)
Constant	-1.600	-1.534	-0.992	-1.324	-1.552
	(-0.68)	(-0.63)	(-0.69)	(-0.55)	(-0.64)
Sukuk+Ramadan+Ramadan×Sukuk			0.416	0.447	0.381
F			0.781	0.899	0.624
Ramadan+Ramadan×Sukuk			0.539	0.542	0.545
F			1.527	1.546	1.584
Sukuk+Ramadan×Sukuk			1.479*	1.523**	1.442*
F			3.649	3.958	3.905
N	2140	2140	2140	2140	2140
N of issuers (clusters)	133	133	133	133	133
R^2	0.0140	0.0141	0.00843	0.00881	0.0164
F	4.804***	4.392***	2.004***	2.087***	4.268***

Table 5
Unique and Multiple Issuers

The table presents the regression results where cumulative abnormal returns is the dependent variable. The sample is divided between unique issuers (firms which have only issued one type of security in the five previous years) and multiple issuers. Dummy variables for sectors and years are included but not reported. The variances are clustered at the issuer level. T-values are in parentheses and stars denote the significance (*p<0.1, **p<0.05, ***p<0.01).

	Unique Issuers			*Multiple Issuers*		
	(1)	(2)	(3)	(1)	(2)	(3)
Sukuk	-0.035	-0.027	0.027	-1.157	-1.005	-0.987
	(-0.15)	(-0.12)	(0.11)	(-1.19)	(-1.11)	(-1.03)
Ramadan	-1.604**	-1.596**	-1.623**	-0.173	-0.332	-0.260
	(-2.15)	(-2.16)	(-2.14)	(-0.15)	(-0.30)	(-0.21)
Sukuk×Ramadan	2.065*	2.052*	2.087*	1.342	1.479	1.404
	(1.87)	(1.87)	(1.88)	(1.05)	(1.16)	(1.05)
Amount		-0.064	-0.141		0.340	0.359
		(-0.60)	(-1.29)		(1.10)	(1.17)
Maturity		0.004	0.005		-0.107	-0.145
		(0.08)	(0.08)		(-0.79)	(-0.94)
Size			0.201*			0.359
			(1.91)			(0.95)
Market-to-Book			0.030			-0.319
			(0.52)			(-1.34)
Leverage			-0.011			0.0175
			(-0.69)			(0.69)
Current ratio			0.202**			0.107
			(2.52)			(0.89)
Profitability			0.075**			-0.033
			(2.02)			(-0.56)
Constant	-0.488	0.615	-1.369	-1.642	-7.677	-9.959
	(-0.84)	(0.33)	(-0.74)	(-1.20)	(-1.30)	(-1.67)
Sukuk+Ramadan+Ramadan×Sukuk	0.426	0.429	0.491	0.0114	0.143	0.157
F	0.248	0.252	0.309	0.001	0.0215	0.0261
Ramadan+Ramadan×Sukuk	0.461	0.456	0.464	1.169**	1.147*	1.144**
F	0.325	0.316	0.336	4.233	4.073	4.298
Sukuk+Ramadan×Sukuk	2.030*	2.025*	2.114*	0.184	0.475	0.417
F	3.031	3.037	3.366	0.150	0.528	0.319
N	1426	1426	1426	467	467	467
N of issuers (clusters)	105	105	105	33	33	33
R^2	0.0140	0.0142	0.0272	0.0399	0.0428	0.0482

Table 6
Robustness Checks

The table presents four robustness regressions for the Ramadan specification. Column 1 uses an alternative window, [-1,0]. Column 2 presents an alternative computation of expected returns, using a modified model (*CAR Modified)*, with a [-1,1] window. Column 3 uses an alternative index to compute CAR, FBM100 (*CAR FBM100*). Last, column 4 tests the influence of the crisis period with a dummy variable *Crisis* equal to one if the year is 2008 or 2009 and zero otherwise. Dummy variables for sectors and years are included but not reported. The variances are clustered at the issuer level. T-values are in parentheses and stars denote the significance (*p<0.1, **p<0.05, ***p<0.01).

	(1)	(2)	(3)	(4)
	CAR[-1,0]	CAR Modified	CAR FBM100	Crisis
Sukuk	-0.197	-0.313	-0.154	-0.163
	(-0.82)	(-1.63)	(-0.67)	(-0.72)
Ramadan	-0.954	-0.693	-1.085*	-1.061*
	(-1.54)	(-1.54)	(-1.84)	(-1.80)
Sukuk×Ramadan	1.467*	0.903	1.592**	1.614**
	(1.88)	(1.60)	(2.17)	(2.17)
Crisis				-0.204
				(-0.16)
Sukuk×Ramadan×Crisis				-0.0485
				(-0.05)
Amount	-0.072	0.112	-0.020	-0.0142
	(-0.80)	(1.61)	(-0.19)	(-0.13)
Maturity	-0.0346	0.002	-0.052	-0.0525
	(-1.13)	(0.04)	(-1.60)	(-1.60)
Size	0.126	0.061	0.172	0.169
	(1.35)	(0.59)	(1.63)	(1.62)
Market-to-Book	0.040	0.009	0.002	0.00175
	(0.66)	(0.21)	(0.03)	(0.03)
Leverage	-0.0140	0.007	-0.009	-0.00994
	(-1.15)	(0.87)	(-0.71)	(-0.75)
Current ratio	0.125***	0.084**	0.189***	0.192***
	(2.96)	(2.02)	(3.83)	(3.88)
Profitability	0.055**	0.011	0.048	0.0470
	(2.04)	(0.51)	(1.48)	(1.44)
Constant	-1.029	-3.475*	-1.736	-1.548
	(-0.43)	(-1.80)	(-0.71)	(-0.64)
N	2140	2140	2140	2140
N of issuers (clusters)	133	133	133	133
R^2	0.0102	0.0193	0.0166	0.0200
F	4.388***	3.133***	4.206***	4.438***

Conclusion

This dissertation has studied the corporate bond market. It has investigated the motives leading firms to issue bonds and the impact of this issue on the firm value. The focus of the dissertation was on the role of corporate governance and on specific issues in emerging countries. This work has shed light on the recent expansion of the corporate bond markets over the last decade. It has tackled questions on the role of legal environment, information asymmetries and agency problems. It has taken into account the specific features of developing economies and provided new evidence on these rapidly expanding markets.

Chapter one has shown the importance of the legal environment on the bond market. Creditors' information turns out to be a catalyst of bond market development. Offering investors a public registry of borrowers' standings substantially supports firms' access to the bond market, helping companies issuing bonds and reducing their liquidity risk. However, the results also show that a better legal environment primarily benefits to firms that already exhibit good governance standards. Additional measures may be necessary to affect all the firms in the same extent.

Chapter two intends to settle a disagreement in the literature regarding the impacts of a bond issue on the firm value. Conducting a meta-analysis on previous published works, it has provided an estimate of the value a bond entails for shareholders. This work has also underlined the reasons explaining diverging results in the literature. It provides methodological recommendations for future work and opens new avenues for research.

Chapter three has investigated the Chinese corporate bond market. We have shown the importance of state ownership and management ownership on the value created by a bond offering. State ownership turns to have a positive impact on the firm value when the firm access the bond market. Management ownership has a nonlinear impact, reflecting the alignment of management's interest with shareholders' interests in the use of the bond's proceeds. This paper emphasizes the primary role of ownership in Chinese companies. More generally, it highlights the role of specific governance issues in emerging countries and the importance to take them into account.

Chapter four has provided an illustration of the role of behavioural biases on the firm value. Using an innovative identification strategy, it has isolated a religious component in investors' trading. These results reinforce the literature on behavioural biases in finance. It also demonstrates that financial value could be hard to define and essentially stems from the investors' convictions.

Following this dissertation, there remains substantial avenues for future research. Further research on the role of legal environment at the firm-level would deserve a particular attention since this dissertation documents different effects across firms from a same country. Investigations on the Chinese bond market's specific features are still nascent and additional work is needed to fully understand the role of the state on the market. Last, this work mainly focuses on the corporate bond market and follows the literature by excluding the financial industry. Investigating why banks issued bond and what are the impacts on their activity (*e.g.* credit allocation, liquidity creation) constitutes a promising avenue for future research.

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Résumé de la Thèse en Français

Le marché obligataire émergea à la fin du 16ème siècle au Pays-Bas. Historiquement, il contribua au financement du commerce avec les Indes (Gelderblom and Jonker (2006)). Ainsi, la compagnie danoise des Indes de l'Est émis son premier financement obligataire en 1604 pour assurer l'établissement de la route des Indes. Les pays européens voisins intégrèrent progressivement l'innovation néerlandaise, qui leur permit notamment de réduire leurs taux d'intérêts (Homer (1975)). Au fur et à mesure des années, ce type de financement devint de plus en plus important pour les entreprises à fort besoin de capitaux. Des obligations furent ainsi émises pour financer de grands projets d'infrastructures tels les chemins de fer (Kindleberger (2005)). Malgré des épisodes tumultueux (Giesecke et al. (2011)) le marché obligataire poursuit son développement et contribua au développement financier des pays (Kuran (2012)).

Durant la dernière décennie, le marché obligataire s'est considérablement développé[20]. Il est devenu une source de financement majeur pour les entreprises. En 2013, le marché obligataire des entreprises a atteint 49 trillions de dollars, soit environ trois sa taille au début des années 2000. Ainsi, les obligations sont devenues de plus en plus important dans le financement des économies. Dans les pays développement, le financement obligataire privé représente en moyenne 169% du PIB. De plus en plus d'entreprises comptent ainsi sur l'émission d'obligation pour financer leurs investissements. L'activité du marché s'est considérablement accrue. En 2013, 3,2 trillions de dollars de nouvelles obligations ont été émises. Ce chiffre est à mettre en perspective avec les 0,9 trillions de dollars de nouvelles obligations en 2000. Une telle expansion fait qu'aujourd'hui un quarter du financement des entreprises dans le monde est assuré par des émissions obligataires.

Ce constat doit cependant être nuancé, en distinguant la situation des pays développées et des pays émergents. Alors que les pays développés affichent des marchés obligataires matures, le constat est plus contrasté au sein des pays émergents. Tout d'abord, la profondeur du marché obligataire, c'est-à-dire sa part rapporté au PIB, est bien moindre. En moyenne, le marché obligataire représente seulement 24% du PIB en 2013. Néanmoins, les pays émergents sont également le moteur du développement obligataire actuel. Ils sont aujourd'hui

[20] Les statistiques qui suivent proviennent des rapports de l'OICV-IOSCO « *Corporate Bond Markets: A Global Perspective* » (Tendulkar et Hancock (2014)) et « *Corporate Bond Markets: An Emerging Perspective* » (Tendulkar (2015)).

les principaux contributeurs à la croissance du marché. Entre 2000 et 2013, 37 nouveaux pays émergents ont développé un marché des obligations. Et alors que les économies émergentes ne comptabilisaient que 5% des émissions mondiales en 2000, elles représentent 30% du marché. Le rythme de développement des marchés obligataires privés dans les pays émergent est ainsi soutenu. La taille du marché a triplé en 10 ans, atteignant 6,9 trillions de dollar en 2014.

Néanmoins, les situations sont particulièrement différentes entre pays émergents. Les trois plus grands marchés, c'est-à-dire la Chine, la Corée du Sud et le Brésil, totalisent 70% du marché obligataire privé au sein des pays émergents. Parmi ce groupe de tête, la Chine constitue de loin le plus grand marché. En 2014, le marché obligataire des entreprises chinoises se chiffrait à 2,7 trillions de dollars. À titre de comparaison, cela représente trois fois la taille du second marché obligataire émergent (la Corée du Sud). C'est aussi plus que la taille combiné des marchés des 9 pays suivants.

Ces chiffres mettent en exergue le rôle majeur que les marchés obligataires jouent dorénavant dans le financement obligataire des entreprises. Ils soulignent également leur importance grandissante dans les pays émergents. De plus en plus d'entreprises choisissent le financement obligataire pour assurer leur financement par endettement. Cette situation n'est pas anodine et fait résonner deux questions chez le chercheur. Ces deux questions constituent le cœur de cette thèse : **pourquoi les entreprises choisissent-elles d'utiliser le financement obligataire et quels sont les impacts de ce choix sur leur valeur ?**

Répondre à ces questions requiert de mettre en perspective la littérature présente jusqu'alors. La toute première approche de la finance d'entreprise a été de souligner l'inanité d'un quelconque choix de financement pour la valeur de la firme. Ce principe fondateur a été mis en avant et démontré par Modigliani et Miller (1958). Ils développèrent un modèle où il n'existe pas de raison pour la firme de préférer la dette au financement par capitaux propres, puisque la valeur de l'entreprise n'est pas déterminée par sa structure de financement mais par ses investissements. Cependant, il ne faudrait se tromper sur la portée que les auteurs donnent à leur modèle. Ainsi qu'ils le soulignent, leur contribution principale est de fournir un cadre théorique simple soumis à des hypothèses, dans le seul but d'expliquer pourquoi ce cadre ne tient pas dans la réalité et ainsi pourquoi les entreprises ont effectivement des préférences de financement. En remettant en cause les hypothèses sous-jacentes à leur modèle, les auteurs démontrèrent ainsi dans le même article le rôle de la déductibilité fiscale des intérêts et la préférence pour la dette que cette situation engendre. Dès cet article, ils évoquèrent également

l'hypothèse fondamentale de convergence des intérêts du mangement et des propriétaires de la firme[21]. Remettre en cause leurs hypothèses n'équivaut pas tant à remettre en cause leur modèle qu'à identifier les raisons faisant que les firmes dévient de la théorie dans la pratique financière.

Dès lors, une importante littérature s'engouffra dans cette approche et souligna les raisons sous-tendant les préférences de financement des entreprises. Cette littérature remis en cause les hypothèses du modèle de Modigliani et Miller (1958) au travers de deux principaux axes : les asymétries d'information et les problèmes d'agence.

Des asymétries d'information surviennent lorsque certains agents sont mieux informés que leurs contreparties. Dans son article fondateur, Akerlof (1970) montre comme les asymétries d'information affectent un marché. En présence d'asymétries d'informations, les vendeurs d'un produit de bonne qualité finissent par quitter le marché où seuls des produits de mauvaises qualité demeurent. Ce raisonnement a été étendu au cas du mode de financement de l'entreprise par Myers et Majluf (1984). Leur travail démontre la façon dont les asymétries d'information accroissent le coût du capital. Le mode de financement qui inclut le plus d'asymétries d'information est le plus couteux pour l'entreprise. En suivant cette approche, ils établissent un ordre de préférence (*pecking order*) dans les choix de financement d'une entreprise. Ils poursuivent en cela une approche qui les précède mais n'avait pas été démontré formellement par Donaldson (1969).

Selon cet ordre de préférence, la firme sélectionne d'abord le mode de financement comprenant le moins d'asymétries d'information. Une fois ce mode de financement épuisé, elle s'oriente progressivement vers les modes de financement comprenant de plus en plus d'asymétries d'information. La raison tient à ce que la firme paye un premium informationnel qui accroît le coût du capital (Stein (1992)). Au final, leur ordre de préférence prédit une utilisation première des fonds propres, puis du financement par emprunt pour finir par du financement externe en capitaux propres.

Un aspect central de l'ordre de préférence de Myers et Majluf est qu'il ne pose pas l'hypothèse d'un quelconque problème d'agence au sein de la firme. Au contraire, le modèle postule explicitement que les intérêts des investisseurs et du management sont alignés. Par conséquent, les prédictions découlant de cette approche sont entièrement basées sur des

[21] Modigliani et Miller (1958) soulignent ainsi que les profits sont regardés comme des dividendes dans leur modèle, assimilant la maximisation de l'un à la maximisation de l'autre. Cette hypothèse, comme ils le soulignent, « *est valable tant que le management est supposé agir dans le meilleur intérêt des détenteurs de capitaux propres* » (p. 266, traduction du rédacteur).

considérations informationnelles. Myers (1984) le résume ainsi dans son papier sur le « Mystère de la structure du capital » (*Capital Structure Puzzle*) :

> « *J'ai choisi de ne pas considérer les modèles qui coupent le cordon ombilical reliant les actes du management aux intérêts des actionnaires*[22]*.* »

À côté des asymétries d'information, la littérature s'est précisément focalisé sur la divergence d'intérêts entre le management et les investisseurs afin d'expliquer la structure du capitale des entreprise. Si Berle et Means (1932) évoquent déjà les problèmes d'agences que font naître les formes modernes des entreprises, le développement de la littérature s'accélère avec le papier fondateur de Jensen et Meckling (1976). Des intérêts divergents entre les investisseurs (tant les créanciers que les actionnaires) et le management génèrent des coûts d'agence qui réduisent la valeur de l'entreprise. Jensen et Meckling (1976) divisent ces coûts d'agence en trois composants des coûts d'agence : les coûts de contrôle, les coûts de contrainte et les coûts résiduels. La littérature identifient l'apparition de ces coûts sous de nombreuses formes : du surinvestissement (Stulz (1990)), du sous-investissement (Berkovitch et Kim (1990)), un endettement excessif (Myers (1977)), la construction d'empires financiers (Jensen (1986)), l'expropriation des actionnaires (Faccio, Lang et Young (2001)) et les gratifications du management (Yermack (2006)).

L'existence de coûts d'agence est à la base de la théorie du compromis (*tradeoff theory*). La structure du capitale d'une entreprise est fonction des coûts d'agence et d'autres imperfections de marchés telles la déductibilité fiscale des intérêts (Modigliani et Miller (1963)), les coûts de faillite (Gruber et Warner (1977)), la fiscalité des investisseurs (DeAngelo et Masulis (1980)) et jusqu'au rôle du bien-être des employés (Verwijmeren et Derwall (2010)). La théorie du compromis suit un raisonnement marginaliste tel que la firme émet de la dette jusqu'au point où le bénéfice marginal de l'endettement est surpassé par ses coûts.

Au-delà des asymétries d'information et des coûts d'agence, la littérature souligne l'importance des habitudes du management. Miller (1977) propose par exemple une hypothèse de « mutation neutre » : le management s'habitue à un certain mode de financement et sont réticents à changer leurs habitudes. Dans cette perspective, tenter d'expliquer la structure du capital de la firme à l'aide d'un raisonnement financier importe peu, d'autant plus que l'hypothèse de neutralité du mode financement sur la valeur de l'entreprise est maintenue. Cette idée a été reprise et accommodée plus récemment par Welch

[22] Myers (1984), p.576. Traduction du rédacteur.

(2004) qui souligne l'importance d'une « inertie du management ». Chiffres à l'appui, il montre que 40% de la variation du levier des firmes américaines entre 1962 et 2000 est due aux variations boursières. Enfin, à l'inverse, des théories proposent une vision proactive du mangement. Celui-ci exploiterait le marché et vendrait des capitaux propres lorsque la firme est surévaluée, profitant alors des asymétries d'information auxquelles sont exposés les investisseurs externes (Taggart (1977)).

La littérature empirique a progressivement confronté ces hypothèses à la réalité, sans toutefois parvenir à un consensus. D'une part, Flannery et Rangan (2006), Frank et Goyal (2009) ainsi que Zhou et al. (2016) ont fourni des éléments soutenant la vision d'un endettement cible avec une vitesse d'ajustement, c'est-à-dire confortant la théorie du compromis. À l'inverse, Shyam-Sunder et Myers (1999), de Haan et Hinloopen (2003) et de Jong, Verbeek et Verwijmeren (2011) apportent des éléments soutenant l'existence d'un ordre de préférence dans la structure du capital. Et alors que des études défendent l'idée d'une structure du capital stable à travers le temps (tels Lemmon, Roberts et Zender (2008) et Graham, Leary et Roberts (2015)), ce qui soutient notamment la théorie de la mutation neutre, De Angelo et Roll (2015) mettent en exergue la variation de la structure du capital des entreprises dans le temps. Enfin, des études fournissent des éléments soutenant tant la présence (Loughran et Ritter (1997), Baker et Wurgler (2002)) que l'absence (Leary et Roberts (2005), Hovakimian (2006)) d'une exploitation des asymétries d'information du marché par le management.

Ainsi, bien loin d'être concluante, la littérature empirique tente toujours d'expliquer la structure du capital des firmes ainsi que les niveaux d'utilisation de la dette par les entreprises. Quant à l'utilisation des obligations, les résultats demeurent encore plus évasifs. Une importante littérature explique les caractéristiques des obligations émises par les entreprises, comme leur taux (par exemple, Campbell et Taskler (2003), Helwege, Huang et Wang (2014)), leur maturité (Guedes et Opler (1996), Norden, Roosenboom et Wang (2016), Badoer et James (2016)) et leur liquidité (Chen, Lesmond et Wei (2007), He et Milbradt (2014)). Cependant, peu d'études étudient les raisons poussant les entreprises à émettre des obligations en premier lieu.

Un pan de la littérature compare l'utilisation de la dette bancaire à celles des obligations, dans le but d'expliquer les raisons de ce choix. Sitglitz et Weiss (1981) soulignent le rôle des intermédiaires financiers dans la réduction des asymétries d'information sur le marché de la dette. De son côté, Diamond (1984) met en avant le rôle bénéfique de surveillance de l'activité de l'entreprise par les banques par rapport au marché obligataire.

Bien que cet activité de contrôle soit couteuse pour la firme de par un renchérissement de son coût d'emprunt, Fama (1985) montre qu'il permet à la firme d'accéder à l'endettement en réduisant les asymétries d'information et en offrant des conditions de renégociation plus souples que sur le marché obligataire.

Bolton et Freixas (2000) proposent un modèle complet permettant d'expliquer entre le choix des capitaux propres, de la dette et des obligations en présence d'informations asymétriques. Le choix de la dette bancaire provient essentiellement de la plus grande flexibilité offert par les banques et de leur capacité à réduire les asymétries d'information. À l'inverse, les obligations permettent d'éviter les coûts d'intermédiation bancaires. Par conséquent, la dette bancaire est particulièrement utile aux firmes de taille plus modeste, moins diversifiées et plus risquées et n'ayant pas de réputation établie auprès des investisseurs. Les obligations bénéficient elles aux firmes de taille important, qui peuvent amortir les coûts fixes d'une émission et ont déjà une réputation de crédit établie. Petersen et Rajan (1994), Cantillo et Wright (2000) ainsi qu'Altunbas, Kara et Marques-Ibanez (2010) offrent des résultats empiriques confirmant la validité de ces théories.

Cette thèse poursuit ce travail sur le marché obligataire. Elle approfondit les raisons expliquant le choix des obligations par les entreprises ainsi que les conséquences que cela représente pour leur valeur. Une partie de cette étude se focalise sur les marchés émergents qui présentent des enjeux de gouvernance qui leur sont propres (Young et al. (2008)) tout en étant encore peu analysés par la littérature.

Le premier chapitre permet de déterminer le rôle des droits et de l'information des créanciers sur le marché obligataire. À l'aide d'une base de données conséquente couvrant les émissions obligataires dans 38 pays, ce travail isole le rôle du cadre légal offert aux créanciers sur la probabilité qu'une firme a d'émettre une obligation, le montant émis et la maturité employée. Cette approche permet de distinguer le rôle des coûts d'agence et des asymétries d'informations, tout en prenant en compte le rôle des caractéristiques de l'entreprise. Le second chapitre se focalise quant à lui sur une thématique prenant de plus en plus d'ampleur dans les pays émergents. Il propose de comparer les facteurs déterminants dans l'émission d'une obligation avec ceux poussant des entreprises à émettre un type alternatif de dette de marché, les *sukuk*. Les *sukuk* sont des instruments proposés par la finance islamique et principalement émis en Malaisie, où ils représentent la moitié du marché obligataire[23]. Ce

[23] Le marché obligataire malaisien est loin d'être anecdotique. En 2013, la Malaisie avait le second marché obligataire le plus profond parmi les pays émergents (Tendulkar (2015)).

chapitre inverse la perspective conventionnel sur le marché obligataire en expliquant pourquoi certaines firmes lui préfèrent le marché des *sukuk*.

Le second chapitre se base sur la vaste littérature analysant la réaction actionnariale à une émission obligataire. Utilisant la méthodologie de la méta-analyse, il offre une réponse concluante quant à la valeur les actionnaires confèrent à l'émission d'une obligation. Il permet également de réconcilier des résultats jusqu'alors divergents.

Le troisième chapitre se concentre sur les enjeux propres au marché obligataire Chinois. Celui-ci constitue de loin le plus important au sein des pays émergents, mais également le premier dans le monde en termes d'arrangements privés (Celik, Demirtas et Isaksson (2015)). Ce chapitre étudie l'impact des enjeux de gouvernance chinois sur la valeur apportée par une émission obligataire. Il met en exergue le rôle de la propriété étatique, de la détention du capital par le mangement et de la concentration de l'actionnariat. Ces trois aspects sont particulièrement importants en Chine mais sont également partagés par d'autres pays émergents (Young et al. (2008)).

Enfin, le quatrième chapitre propose une illustration originale du rôle que peuvent avoir des facteurs comportementaux sur la valeur de l'entreprise. À l'aide de la différence de valeur que les actionnaires confèrent à l'émission d'une obligation standard et d'un *sukuk* durant le Ramadan, ce chapitre isole un composant religion dans la réaction des actionnaires. Loin d'être négligeable, cet aspect religieux est substantiel et peut être attribué à la religiosité de l'investisseur. Ce chapitre met ainsi en lumière à la fois des caractéristiques spécifiques à certains pays émergents mais permet également d'illustrer les difficultés que peut connaître la définition du concept de valeur en finance.

Premier Chapitre – De l'impact de l'environnement légal sur les émissions obligataires des entreprises

Quels sont les impacts des droits et de l'information des créanciers sur le marché obligataire privé ? Une entreprise accède-t-elle plus facilement le marché obligataire lorsque les droits des créanciers sont forts et lorsqu'ils ont une meilleure connaissance de la situation financière de la firme et de son endettement ? Est-ce que des créanciers faiblement protégés prêtent malgré tout de la monnaie sur le marché obligataire lorsqu'ils connaissent les risques qu'ils encourent ? Ces questions sont fondamentales pour le développement du marché obligataire. Y répondre peut expliquer pourquoi les obligations sont plus utilisées dans certains pays et quel environnement légal il est opportun de créer afin de favoriser le développement du marché.

La littérature reliant loi et finance met en exergue les impacts de la protection des investisseurs sur les marchés financiers (La Porta et al. (1997))., sur la concentration de l'actionnariat (La Porta et al. (1998)), sur la protection des parties prenantes (Johnson et al. (2000), La Porta et al. (2000)) et plus récemment sur la valeur de la firme (McLean, Zhang et Zhao (2012)) et la structure du capital (Fan, Titman et Twite (2012)). Cependant, aucun papier n'a étudié l'impact de la protection des investisseurs sur le marché obligataire en soi. Gu et Kowalewski (2016) propose une première ébauche visant à relier marché financier et protection des créanciers. Ils étudient ainsi la façon dont les droits des investisseurs impactent la taille relative du marché obligataire et du marché action. Néanmoins, ils se limitent à analyser l'impact sur la taille relative des deux marchés et réalisent leur analyse au niveau du pays et non de la firme.

Le but poursuivi par ce chapitre est d'estimer l'impact des droits des créanciers et de leur information sur la probabilité qu'à une entreprise à émettre un bond, ainsi que sur le montant émis et la maturité utilisée. L'analyse est fondée sur deux hypothèses. Tout d'abord, des droits des créanciers plus élevés rend le management moins susceptible de s'engager dans des activités néfaste pour la valeur de l'entreprise. Par cela, la firme peut avoir un accès facilité au marché obligataire et accroître le montant de ses émissions. De meilleurs droits des créanciers peuvent également affecter la maturité émise sur le marché. Cela, soit en réduisant le premium de liquidité et en favorisant ainsi l'émission de maturités longues (Aghion, Bolton et Tirole (2004)), soit en réduisant le risque de liquidité et en favorisant ainsi des maturités de court-terme (Diamond (1991)).

Ensuite, une meilleure information des créanciers peut également faciliter l'accès au marché ainsi qu'accroître les montants émis. Lorsque les créditeurs sont mieux informés de la qualité de l'emprunteur, ils peuvent plus adéquatement ajuster leurs prix afin de refléter son risque. Par conséquent, une meilleure information des créanciers peut permettre de réduire le rationnement du crédit sur le marché obligataire. L'information peut également influencer la maturité des obligations émises. Des créditeurs mieux informés peuvent s'engager à moindre coût dans des emprunts de long-terme en réduisant les incertitudes entourant l'emprunteur (Barclay et Smith (1995)). En même temps, une meilleure information révèle également la qualité des emprunteurs. Cela peut davantage contraindre les emprunteurs de mauvaise qualité à emprunter à court-terme tout en confortant les émetteurs de bonne qualité dans leur utilisation de maturités courtes (Diamond (1991)).

L'analyse est entreprise au niveau de la firme. Pour ce faire, les données concernant les émissions obligataires de 38 pays ayant eu lieu entre 2002 et 2006 sont réunies, atteignant

un total de plus de 17000 émissions. Cela permet d'obtenir des informations précises tant sur les émissions que sur les émetteurs. L'objectif est d'éviter d'utiliser des données aggrégées au niveau dans l'analyse du lien entre le marché obligataire et la protection des créanciers. L'utilisant d'agrégats nationaux est une pratique courante dans la littérature sur la loi et la finance. Holderness (2016) souligne les nombreux problèmes que soulève leur utilisation. Le plus important est d'ordre méthodologique. Les agrégats nationaux suppriment la variance au sein du pays et peuvent engendrer un biais d'agrégation, qui confère un poids disproportionné aux pays ayant de petits marchés de capitaux. Holderness (2016) démontre que de nombreux résultats standards de la littérature s'évanouissent lorsque ce biais est pris en compte (ce problème avait paradoxalement déjà été mentionné par l'article fondateur de La Porta et al. (1997)). Ce chapitre se tient à l'écart d'un tel biais en basant les résultats sur une analyse au niveau de la firme.

L'utilisation d'une approche au niveau de la firme permet également de prendre en compte la variance au sein d'un pays. À nouveau, Holderness (2016) soulève l'aspect paradoxal de l'utilisation d'agrégats nationaux pour expliquer un impact au niveau de la firme et non du pays. En posant le niveau d'analyse au niveau de l'entreprise résout ce problème. Cette approche permet non seulement de contrôler des caractéristiques de l'émetteur mais plus encore de déterminer si l'effet de la protection et de l'information des créanciers est similaire entre les firmes d'un même pays. Cela permet notamment d'examiner si des firmes présentant des niveaux différents d'asymétries d'information et de problèmes d'agence sont impactés similairement par l'environnement légal. Pour cela, deux effets distincts sont identifiés. Tout d'abord, de meilleurs droits des créanciers peuvent bénéficier le plus aux firmes ayant des difficultés à accéder au marché obligataire. En réduisant les risques d'aléa moral du management et en favorisant une information plus transparente, ces firmes peuvent alors accéder plus aisément au marché obligataire. En ce sens, de meilleurs standards pour les créanciers *égalisent* les différences entre les firmes. À l'opposé, une meilleure information et protection des créanciers peut être susceptible d'avantager les firmes ayant déjà un faible niveau de coûts d'agence et déjà fermement établies sur le marché obligataire. Par exemple, cela peut renforcer l'effet de réputation (Hale et Santo (2008)). Dans ce cas, l'environnement légal *renforce* les différences entre les firmes d'un même pays.

Ce chapitre fournit trois résultats principaux. Premièrement, lorsqu'ils sont considérés séparément, à la fois la protection des créations et leur information ont un impact positif sur l'accès au marché obligataire et le montant émis. Quant à la maturité, des créanciers mieux informés réduisent la maturité des titres émis. Ce résultat est conforme aux hypothèses de

Diamond (1991) : lorsque les créanciers connaissent la qualité des emprunteurs, ils sont réticents à prêter à long-terme à des émetteurs de moindre qualité. En même temps, les émetteurs de meilleure qualité savent qu'ils pourront se refinancer sans peine par la suite et préfèrent utiliser des emprunts de court-terme.

Si tant la protection que l'information des créanciers importent lorsqu'ils sont considérés séparément, seule l'information des créditeurs maintient son influence lorsqu'ils sont considérés simultanément. Il s'avère que des créditeurs informés importent davantage que des créditeurs protégés. Lorsque les créanciers connaissent les risques auxquels ils s'exposent, et peuvent donc leur donner un prix, ils sont également plus aptes à prêter sur le marché obligataire. De plus, ce résultat vaut également lorsque l'origine légal et le niveau de gouvernance sont considérés. Cela est donc particulièrement encourageant pour les pays en développement. Même avec des niveaux de corruption plus élevés et une protection des créanciers plus faibles, ces pays peuvent promouvoir le développement du marché obligataire en améliorant l'information des créanciers. Des progrès substantiels peuvent être établis dans cette direction puisque seulement 38% des pays de l'échantillon offrent un registre public de l'endettement.

Enfin, ce chapitre montre que les firmes au sein d'un pays ne sont pas pareillement affectées par l'environnement légal. Ils s'avèrent que les firmes ayant de plus faibles niveaux de coûts d'agence et d'asymétries d'information et étant déjà bien établies sur le marché obligataires sont aussi celles qui bénéficient le plus de la protection et l'information des créanciers. Cela suggère le besoin de mesures additionnelles afin de favoriser l'accès au marché obligataire de firmes ayant des niveaux élevées d'asymétries d'information et de coûts d'agence. Ce résultat souligne également l'importance de considérer les caractéristiques financières au niveau de l'entreprise dans la littérature sur la loi et la finance.

Deuxième Chapitre – De la valeur d'une émission obligataire : une méta-analyse.

Ce second chapitre propose de répondre à la question de l'impact d'une émission obligataire sur la valeur de l'entreprise, en considérant le point de vue des actionnaires. Cette question a déjà été largement traitée par la littérature. Dann et Mikkelson (1984) offrent la première étude sur le sujet et seront suivis par 28 autres recherches de ce type. Cette inflation du nombre d'études s'explique par des résultats loin d'être concluants. Certains papiers documentent un effet négatif (p. ex. Eckbo (1986), Datta, Iskandar-Datta, et Patel (2000)), d'autres un effet positif (Kim et Stulz (1988), Miller et Puthenpurackal (2005)) et d'autres encore une absence de réaction (Mikkelson et Partch (1986), Jung (2009)). Par conséquent, la

littérature n'apporte pas une réponse consensuelle sur la valeur qu'à une émission obligataire pour l'actionnariat.

Cette question est d'autant plus délicate à répondre que la littérature théorique de finance d'entreprise fournit des raisons sous-tendant tant un impact négatif qu'un impact positif. Parvenir à émettre sur le marché obligataire peut être valorisant pour les actionnaires. Tout d'abord, une émission obligataire réduit les asymétries d'information. Spence (1976) souline le rôle de signal que joue une obligation, puisque le management se doit de détenir un projet d'investissement de qualité pour s'engager à payer des coupons régulier et mettre, si ce n'est pas le cas, leur position en péril. Ensuite, une émission obligataire permet d'aligner les intérêts du management avec ceux des actionnaires. Le management se retrouve en effet contraint de maximiser la valeur de l'entreprise pour éviter une faillit qui lui serait douloureuse. De plus, une émission obligataire peut réduire l'argent disponible dans les mains des actionnaires de par le payement des coupons. Cet argent disponible pourrait autrement être détourné par le management (Jensen (1986)). Enfin, émettre une obligation c'est aussi réduire son exposition à l'impôt grâce à la déductibilité fiscale des intérêts (Modigliani et Miller (1963)).

Pourtant, à l'inverse, émettre une obligation peut également avoir un impact néfaste pour les actionnaires. Une émission obligataire peut en effet signaler un manque de financement (Miller et Rock (1985)). Elle peut également renforcer l'enracinement du management si les recettes de l'émission ne sont pas dédiées à un projet spécifique (Jensen (1986)). Enfin, une émission obligataire peut résulter en une augmentation excessive du levier et accroître les coûts de faillite (Gruber et Warner (1977)).

Ces prédictions théoriques en sens opposé expliquent en parti que la littérature ne parvient pas à obtenir des résultats concluants sur cette question. Etablir une tendance est alors d'autant plus compliqué que ces études utilisent des méthodologies différentes, étudient des pays différents et s'appuient sur des échantillons de taille variable. Par conséquent, il est malaisé de comparer ces études entre elles sans prendre en compte ces différences. Dans ce chapitre, j'utilise la technique de la méta-analyse. Je calcule tout d'abord un effet global afin de fournir une réponse à la question de la valeur d'une émission obligataire pour les actionnaires. En outre, j'étudie les raisons expliquant les divergences dans les résultats précédents. De cette façon, cette méta-analyse permet également de proposer des recommandations méthodologiques et d'ouvrir de nouvelles voies à la recherche.

Le résultat principal qu'apporte ce chapitre est celui d'une réaction positive des actionnaires à une émission obligataire. Toutefois, si ce résultat est robuste à la prise en

considération de la précision des études, il dépend également de certains choix méthodologiques. Grâce à une analyse de régression multiple, deux facteurs principaux influençant les résultats sont identifiés : le choix de la date de l'évènement et la longueur de la fenêtre d'observation. De plus, la significativité des résultats est affectée par le nettoyage de l'échantillon et le type de statistique employée.

Ainsi, ce papier fournit une réponse précise sur les résultats de la littérature antérieure. Il propose également des recommandations pour la recherche future, telle l'utilisation de tests de robustesse et de statistiques différentes.

Troisième Chapitre – Des émissions obligataires en Chine : le rôle de la propriété.

Ce chapitre étudie les conséquences d'une émission obligataire en Chine. Deux raisons expliquent le choix de la Chine. Premièrement le pays constitue de loin le marché obligataire le plus développé au sein des pays émergents. Dans le même temps, la littérature sur les obligations chinoises demeure maigre. Ensuite le pays expose des enjeux de gouvernance spécifiques (Xu et Wang (1999), Morck et Yeung (2014)). Des niveaux élevés de propriété étatiques ainsi qu'une concentration de l'actionnariat sont susceptibles d'avoir un effet sur la valeur générée par une émission obligataire. Cette question a un intérêt d'autant plus grand que ces spécificités sont également partagés par d'autres pays émergents (Young et al. (2008)). Ce chapitre explore ainsi les conséquences des structures de propriété toutes particulières des entreprises chinoises sur la valeur apportée par une émission obligataire.

L'un des particularismes clé des entreprises chinoises est la propriété par l'Etat. L'Etat, que ce soit au niveau local ou central, est fréquemment l'actionnaire principal. Tian et Estrin (2008) estiment que l'Etat est l'actionnaire principale dans 43,9% des compagnies chinoises au début des années 2000. Pourtant, Peng, Wei et Yang (2011) notent que ces chiffres prennent en compte la seule propriété directe. Lorsque la propriété pyramidale est considérée, ce sont 80% des entreprises chinoises cotées qui s'avèrent être détenues par l'Etat.

La propriété étatique peut jouer un rôle éminent lors d'une émission obligataire. D'un côté, les investisseurs peuvent craindre un investissement inadéquat des montants émis par l'Etat. Plusieurs papiers soulignent le rôle des objectifs politiques, le manque d'incitations et les interférences politiques qui peuvent affecter le management dans ces choix de financement et aboutir à des investissements peu rentables (p. ex. Shirley et Walsh (2001), Wang et Judge (2010)). Cependant, la propriété étatique peut également être bénéfique lors d'une émission obligataire. Les firmes détenues par l'Etat ont en effet un accès privilégié à un marché obligataire particulier, celui des obligations d'entreprise (*enterprise bonds*). Ces obligations

leur permettent d'entreprendre des projets d'envergure nationale, soutenus par l'Etat. Ces émissions engagent des montants plus conséquents, sont plus liquides, et sont surtout garanties par l'Etat (Reuters (2015)). Par conséquent, elles constituent une source de financement moins onéreuse et moins risquée pour l'entreprise.

Le second élément marquant des entreprises chinoises est la concentration de l'actionnariat. Allen, Qian et Qian (2005) insistent sur le rôle de la famille et des conglomérats dans la propriété privée chinoise, le plus souvent au travers de structure de propriétés pyramidales (Xiao et Zhao (2014)). Une plus grande concentration de l'actionnariat peut accroitre la valeur de l'entreprise en assurant un meilleur contrôle du management dans son utilisation des recettes de l'émission. Cependant, une très forte concentration ouvre également la voie à l'expropriation des actionnaires minoritaires (Shleifer et Vishny (1997)). Cette situation peut survenir tout particulièrement en Chine où les standards de gouvernance demeurent faibles (Allen, Qian et Qian (2005)). Les actionnaires majoritaires ont alors davantage de pouvoir pour extraire les bénéfices d'une émission obligataire, réduisant par là-même la valeur de l'entreprise (Johnson et al. (2000), Faccio, Lang et Young (2009)).

Enfin, les entreprises chinoises sont caractérisées par un degré élevée de détention du capital par le management, le propriétaire principal étant bien souvent le gérant et mettant en place des membres de sa famille ou de son cercle proche à des positions clés (Chen et al. (2011)). D'une certaine façon, la propriété de l'entreprise par son management peut permettre la résolution de conflits d'agence entre le détenteur et le gestionnaire de l'entreprise, qui ne forment alors plus qu'une seule et même personne (Jensen et Meckling (1976)). Cependant, de la même façon que pour la concentration de l'actionnariat, le management peut alors être tenté d'extraire de la valeur de l'entreprise, d'autant plus qu'il occupe les positions lui permettant de le faire aisément. Dans ce cas, le management peut extraire les recettes d'une émission obligataire et appauvrir l'entreprise.

S'appuyant sur la réaction des actionnaires à une émission obligataire, ce chapitre fournit trois résultats majeurs. Tout d'abord, une émission obligataire est favorablement accueillie par les actionnaires en Chine. Cela souligne le rôle de signal que représente l'accès au marché obligataire. Ce rôle semble particulièrement sensible en Chine où l'accès au marché obligataire est réservé à une portion congrue d'entreprises, qui montrent leur habilité à entretenir des liens étroits avec l'administration. La propriété s'avère être un facteur clé dans la valeur créée par une émission obligataire. La propriété étatique assure une survalorisation de l'émission en comparaison avec les entreprises privées.

La propriété par le management joue également un rôle dans la valeur apportée par une émission obligataire, mais son influence s'avère être non linéaire. La propriété par le management accroît tout d'abord la valeur qu'une émission obligataire apporte à l'entreprise. En-dessous d'un certain niveau de propriété managériale (5%), celle-ci permettre d'aligner les intérêts du management avec ceux des actionnaires. Cependant, au-dessus de ce seuil et jusqu'à à un niveau plafond (44%), la propriété de l'entreprise parle management a un impact négatif sur la valeur qu'une obligation apporte aux actionnaires. Au sein de cet intervalle, les intérêts du management semblent ne pas être alignés avec ceux des actionnaires. Tout au contraire, les actionnaires semblent alors suspecter le management d'extraire les recettes de l'émission à leur dépends. À nouveau, dans le cas d'une propriété managériale très élevée (supérieure à 44%), la réaction de l'actionnariat redevient positive. Dans ce cas, les intérêts des actionnaires et du management sont à nouveau alignés, le management ne se volerait en sorte qu'à lui-même, et une émission obligataire contribue à accroître la valeur de l'entreprise.

En somme, ce chapitre propose une réponse à l'impact que peut avoir une émission obligataire en Chine. Il montre que les enjeux de gouvernance propre à ce pays ont un impact sur la valeur qu'une obligation apporte à l'entreprise. Ce travail encourage des recherches futures sur le marché obligataire et met en exergue l'importance qu'il y a à considérer les particularités des pays émergents et leur impact potentiel sur les marchés financiers.

Quatrième Chapitre – De la distinction d'un effet bien-être et d'un effet religieux dans le comportement des investisseurs.

Ce dernier chapitre s'attache à l'étude d'une question originale, celle d'une influence potentielle de la religion sur le comportement des investisseurs financiers. Le marché croissant des *sukuk* en Malaisie est fondé sur l'aspect religieux de ces titres. La question fondamentale que cette situation génère est donc de savoir si les investisseurs sont effectivement sensibles à la religiosité des *sukuk*, et plus généralement si la religion peut influencer le comportement des acteurs des marchés financiers. Le rôle de la religion a été démontré au sein des institutions économiques (par exemple, Stulz et Williamson (2003)), des marchés (Kumar, Page et Spalt (2011)) et du comportement des agents (Guiso, Spaienza et Zingales (2003)). Cependant, son rôle sur les investisseurs financiers est plus incertain, la majorité d'entre eux étant des professionnels de la finance. Bien que les investisseurs professionnels puissent également être sujets à des biais psychologiques (p. ex. Barberis et Thaler (2003), le manque d'information sur ces investisseurs (tel que leur religiosité) ne

permet pas d'identifier l'existence d'un biais religieux. Ce chapitre vise à combler ce manque dans la littérature à l'aide d'une stratégie d'identification originale.

Pour isoler un potentiel biais religieux des investisseurs, cette étude poursuit une stratégie d'identification en deux étapes. Premièrement, elle se concentre sur une période particulière, celle du mois du Ramadan en Malaisie. Le choix de la Malaisie provient de son marché obligataire et de *sukuk* développé. Le mois du Ramadan est susceptible d'accroître le sentiment religieux par rapport au reste de l'année. Cependant, il accroit également le bien-être des agents qui profitent de davantage de jours de congés et de fêtes. Pour distinguer et effet bien-être de l'effet religieux, l'analyse compare la valeur que les investisseurs confèrent aux *sukuk* et aux obligations conventionnelles durant ce mois. La logique sous-jacente est que la *différence* dans cette valorisation *durant* le mois de Ramadan, et comparé au reste de l'année, peut être attribuable à la religiosité des investisseurs (une fois que les facteurs financiers et économiques des émissions sont pris en compte). Ainsi, il est possible de fournier une mesure concrète de la religiosité des investisseurs.

Les résultats sont concluants. La réaction des investisseurs à une émission de *sukuk* durant le ramadan est significativement plus élevée que celle suivant une émission obligataire. En outre, cette valeur attribuée à la composante religieuse du *sukuk* n'est pas négligeable. Elle représente un rendement anormal de 1,6% comparé à une obligation. En prenant la capitalisation moyenne au sein de l'échantillon, cela représente une valeur boursière supplémentaire de l'ordre de près de 10 millions de dollars, au seul titre de l'aspect religieux. L'entreprise peut ainsi tirer profit de la religiosité de ses investisseurs en exploitant cet aspect calendaire : émettre un *sukuk* durant le Ramadan plutôt que durant le reste de l'année permet de produire une capitalisation boursière supplémentaire de 11,5 millions de dollars.

Ce travail est approfondi en considérant un potentiel mécanisme de récompense-sanction de la part des investisseurs. Un management opportuniste peut-il réellement riter profit de la religiosité des investisseurs en choisissant d'émettre un *sukuk* plutôt qu'une obligation durant le ramadan ? Pour répondre à cette question, qui est aussi celle de la crédulité des investisseurs, le comportement passé de la firme est pris en compte en comparant les firmes n'émettant que des *sukuk* avec celles émettant les deux types de dette. L'idée sous-tendant cette approche est que les entreprises n'émettant que des *sukuk*, que ce soit durant le Ramadan ou non, s'engagent sur le marché des *sukuk* et ne les émettent pas de manière opportuniste durant le Ramadan. Il s'avère en effet que les investisseurs récompensent cet engagement à suivre des principes religieux. L'aspect religieux d'une

émission de *sukuk* ne vaut que pour les firmes n'émettant que des *sukuk* et ignorant le marché obligataire conventionnel.

Au final, ce chapitre permet de fournir des éléments corroborant l'existence d'un biais religieux dans le comportement des investisseurs. Au lieu d'utiliser des proxys religieux, il analyse directement le comportement des investisseurs faisant face à une situation religieuse. Cette étude apporte également des éléments nouveaux sur la finance islamique. Une différence importante entre les titres qui lui sont rattachés et les obligations classiques réside effectivement dans leur aspect religieux. En outre, il est possible pour un émetteur de tirer profit de cet aspect, aussi longtemps qu'il fait montre d'un certain engagement auprès des investisseurs.

Pour conclure, cette thèse a fourni une étude du marché obligataire des entreprises. Elle a analysé les ressorts incitant les firmes à émettre des obligations et les conséquences que cela représente pour leur value. Ce travail s'est concentré sur les éléments de gouvernance et sur les enjeux spécifiques ayant cours dans les pays émergents. Il a permis de mieux expliquer le développement récent du marché obligataire sur la dernière décennie. Les chapitres ont notamment permis de répondre à des questions sur le rôle de l'environnement légal, des asymétries d'information et des problèmes d'agences. En prenant en compte les spécificités des marchés obligataires au sein des pays émergents, cette thèse a affiné la compréhension de leur fonctionnement.

Tout d'abord, le premier chapitre a démontré le rôle que joue l'environnement légal sur le marché obligataire. L'information des créditeurs s'est avéré être un véritable catalyseur du développement obligataire. Fournir un registre public des crédits contribue fortement à l'accès des entreprises au marché des obligations et permet de réduire leur risque de liquidité. Cependant, ces résultats montrent également qu'une amélioration de l'environnement légal bénéficie avant tout aux firmes disposant déjà d'une bonne gouvernance. Des mesures additionnelles peuvent donc s'avérer nécessaires pour que toutes les firmes bénéficient dans la même mesure de la protection et l'information des créanciers.

Le second chapitre de cette thèse a proposé une réponse aux résultats divergents de la littérature quant à la valeur qu'apporte une émission obligataire. À l'aide d'une méta-analyse se basant sur les travaux précédemment publiés, cette étude a fourni une estimation globale de la valeur que les actionnaires accordent à une obligation. Ce travail met également en lumière les raisons expliquant des résultats jusqu'alors divergents au sein de la littérature. Il peut ainsi offrir des recommandations pour les travaux futurs et ouvrir de nouvelles voies de recherche.

Le troisième chapitre s'est intéressé au marché chinois des obligations émises par des entreprises. Il a souligné l'importance de la propriété étatique et managériale sur la valeur apportée par une émission obligataire. La détention de l'émetteur par l'Etat s'avère avoir un effet positif sur la valeur des capitaux propres. Pour la propriété de l'entreprise par le management, cet effet n'est pas linéaire et reflète avant tout l'alignement des intérêts du management avec ceux des actionnaires dans l'utilisation des recettes de l'émission. Cette étude met ainsi en exergue le rôle central de la propriété pour les entreprises chinoises. De façon plus générale, elle souligne également les enjeux spécifiques de gouvernance au sein des pays émergents, et l'importance qu'il y a à les prendre en compte.

Le quatrième et dernier chapitre offre une illustration du rôle des biais comportementaux sur la valeur de l'entreprise. S'appuyant sur une stratégie d'identification innovante, il a permis d'isoler un composant religieux dans le comportement des investisseurs. Cette étude renforce donc la littérature sur les biais comportementaux en finance. Elle souligne également la difficulté qu'il peut y avoir à définir les limites de la valeur et que celle-ci découle essentiellement des convictions des investisseurs.

À la suite de cette thèse, de nombreuses voies de recherche demeurent ouvertes et restent à défricher. Des travaux futurs sur le rôle de l'environnement légal utilisant une approche au niveau de la firme méritent une attention particulière. Les recherches sur les particularités du marché obligataire chinois demeurent naissantes et des travaux supplémentaires sont requis pour mieux comprendre le rôle de l'Etat sur ce marché. Enfin, conformément à la littérature, ce travail s'est concentré sur le marché obligataire des entreprises non financières. Etudier les raisons amenant les banques à émettre des obligations et les conséquences que cela a sur leur activité (par exemple sur leur allocation de crédit, leur création de liquidité) constituerait des axes de recherche prometteurs.

Table of Contents

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Essays on the Corporate Bond Markets

Résumé

Cette thèse étudie le financement obligataire des entreprises. Les résultats soulignent le rôle de l'environnement légal et de la gouvernance. Le premier chapitre démontre le rôle de la protection et l'information des créanciers sur le marché obligataire. Il identifie un impact non homogène entre les firmes. Le second chapitre analyse l'impact d'une émission obligataire sur la valeur d'une entreprise à l'aide d'une méta-analyse. Il souligne les facteurs expliquant des résultats jusqu'alors divergents dans la littérature. Le troisième chapitre se focalise sur le marché des émissions obligataires des entreprises chinoises et met en exergue le rôle de la propriété étatique et managérial sur la valeur créée par une émission obligataire. Enfin, le quatrième chapitre isole un biais religieux des investisseurs professionnels, et contribue à la littérature comportementale s'intéressant à la valeur de l'entreprise.

Mots clés : Marchés obligataires – Environnement légal – Pays émergents.

Résumé en anglais

This dissertation studies the corporate bond market. Results emphasize the role of legal environment and governance. The first chapter demonstrates the role of creditors' protection and information on the corporate bond market. It identifies a non-homogenous impact across firms. The second chapter uses a meta-analysis to scrutinize the effect of a bond offering on the firm's value. It stresses the reasons underlying diverging results in the literature so far. The third chapter focuses on the Chinese corporate bond market and highlights the role of state and management ownership on the value created by a bond offering. The fourth chapter isolates a religious bias from professional investors and contributes to the literature on the impact of behavioural biases on the firm's value.

Keywords: Corporate Bond Markets – Legal Environment – Emerging Countries.