Laboratoire
de Recherche
en Gestion
& Economie

Working Paper

2017-04

Do Shareholders Value Bond Offerings?

A Meta-Analysis

Paul-Olivier Klein

March 2017

Université de Strasbourg
Pôle Européen de Gestion et d'Economie
61 avenue de la Forêt Noire
67085 Strasbourg Cedex
http://large.em-strasbourg.eu/

IFS
Institut de Finance
de Strasbourg

Do Shareholders Value Bond Offerings?
A Meta-Analysis

This version: March 2017

Paul-Olivier Klein
University of Strasbourg[1]
Email: paul-olivier.klein@unistra.fr
orcid.org/0000-0003-2403-5980

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]Université de Strasbourg, Institut d'Etudes Politiques, 47, avenue de la Forêt-Noire – 67082 Strasbourg Cedex, France.

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[1]. 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 of observations in order to be used in the meta-analysis. This requirement removes one paper from the sample[2].

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. 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*[3].

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 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:

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

$t_i$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*:

$$Weighted\ CAR_i = MainCAR_i \times \frac{n_i}{N} \quad (2)$$

With n_i the number of observations in the i^{th} 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):

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

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[4]. 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.

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:

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

$\overline{CAR}_i$ 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[5].

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 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
Shareholder 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

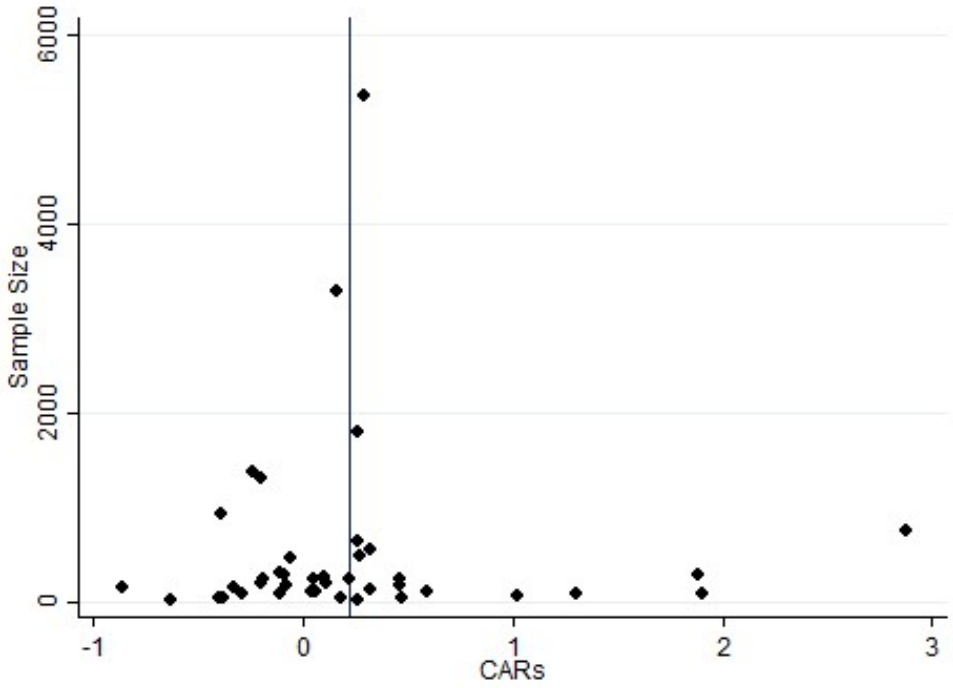
Table 5
Multi-Regression Analysis

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.



References

Alam, Nafis, M. Kabir Hassan, and Mohammad Aminul Haque, 2013, Are Islamic Bonds Different From Conventional Bonds? International Evidence from Capital Market Tests, *Borsa Istanbul Review* 13, 22–29.

Allouche, José, and Patrice Laroche, 2005, A Meta-Analytical Investigation of the Relationship Between Corporate Social and Financial Performance, *Revue de Gestion des Ressources Humaines*, 18.

Ashhari, Zariyawati Mohd, Loo Sin Chun, and Annuar Md Nassir, 2009, Conventional Vs Islamic Bonds Announcements: The Effects on Shareholders' Wealth, *International Journal of Business and Management* 4, p105.

Barber, Brad M., and John D. Lyon, 1997, Detecting Long-Run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics, *Journal of Financial Economics* 43, 341–372.

Bayless, Mark, and Susan Chaplinsky, 1991, Expectations of Security Type and The Information Content of Debt and Equity Offers, *Journal of Financial Intermediation* 1, 195–214.

Bilinski, Pawel, and Abdulkadir Mohamed, 2015, The Signaling Effect of Durations Between Equity and Debt Issues, *Financial Markets, Institutions & Instruments* 24, 159–190.

Boehmer, Ekkehart, Jim Masumeci, and Annette B. Poulsen, 1991, Event-study Methodology Under Conditions of Event-Induced Variance, *Journal of Financial Economics* 30, 253–272.

Brown, Stephen J., and Jerold B. Warner, 1980, Measuring Security Price Performance, *Journal of Financial Economics* 8, 205–258.

Brown, Stephen J., and Jerold B. Warner, 1985, Using Daily Stock Returns: The Case of Event Studies, *Journal of Financial Economics* 14, 3–31.

Cai, Kelly, and Heiwai Lee, 2013, Stock Price Reactions to Debt Initial Public Offering Announcements, *Journal of Applied Business Research* 29, 69–78.

Çelik, Serdar, Gül Demirtaş, and Mats Isaksson, 2015, Corporate Bonds, Bondholders and Corporate Governance, OECD, Paris.

Chang, Shao-Chi, Sheng-Syan Chen, Ailing Hsing, and Chia Wei Huang, 2006, Investment Opportunities, Free Cash Flow, and Stock Valuation Effects of Secured Debt Offerings, *Review of Quantitative Finance and Accounting* 28, 123–145.

Chin, Sze Kim, and Nur Adiana Hiau Abdullah, 2013, Announcements Effect of Corporate Bond Issuance and Its Determinants, *Contemporary Economics* 7, 5–17.

Cooper, Harris M., 1989, Integrating Research: A Guide for Literature Reviews, Second Edition, *Sage Publications*.

Dann, Larry Y., and Wayne H. Mikkelson, 1984, Convertible Debt Issuance, Capital Structure Change and Financing-Related Information: Some New Evidence, *Journal of Financial Economics* 13, 157–186.

Datta, Sudip, Mai Iskandar-Datta, and Ajay Patel, 2000, Some Evidence on the Uniqueness of Initial Public Debt Offerings, *The Journal of Finance* 55, 715–743.

Diamond, D. W., 1991, Debt Maturity Structure and Liquidity Risk, *The Quarterly Journal of Economics* 106, 709–737.

Dietrich, J. Richard, 1984, Effects of Early Bond Refundings: An Empirical Investigation of Security Returns, *Journal of Accounting and Economics* 6, 67–96.

Doucouliagos, Hristos, and T. D. Stanley, 2009, Publication Selection Bias in Minimum-Wage Research? A Meta-Regression Analysis, *British Journal of Industrial Relations* 47, 406–428.

Eckbo, B. Espen, 1986, Valuation Effects of Corporate Debt Offerings, *Journal of Financial Economics* 15, 119–151.

Eckbo, B. Espen, Ronald W. Masulis, and Øyvind Norli, 2007, Security Offerings, *Handbook of Corporate Finance: Empirical corporate finance* (Elsevier).

Edirisinghe, Udani Chathurika, and P. D. Nimal, 2015, Stock Price Reaction to Announcements of Right Issues and Debenture Issues: Evidence from Colombo Stock Exchange, *International Journal of Business and Social Research* 5, 67–76.

Egger, Matthias, George Davey Smith, Martin Schneider, and Christoph Minder, 1997, Bias in Meta-Analysis Detected by a Simple Graphical Test, *British Medical Journal* 315, 629–634.

Fama, Eugene F., Lawrence Fisher, Michael Jensen, and Richard Roll, 1969, The Adjustment of Stock Prices to New Information, *International economic review* 10, 1–21.

Fungacova, Zuzana, Christophe J. Godlewski, and Laurent Weill, 2015, Does the Type of Debt Matter? Stock Market Perception in Europe, Laboratoire de Recherche en Gestion et Economie (LaRGE), Université de Strasbourg.

Gilson, Stuart C., and Jerold B. Warner, 1998, Private Versus Public Debt: Evidence From Firms That Replace Bank Loans With Junk Bonds. SSRN Scholarly PaperSSRN Scholarly Paper.

Godlewski, Christophe J., Rima Turk-Ariss, and Laurent Weill, 2013, Sukuk vs. Conventional Bonds: A Stock Market Perspective, *Journal of Comparative Economics* 41, 745–761.

Gruber, Martin J., and Jerold B. Warner, 1977, Bankruptcy Costs: Some Evidence, *The Journal of Finance* 32, 337–347.

Hansen, Robert S., and Claire Crutchley, 1990, Corporate Earnings and Financings: An Empirical Analysis, *The Journal of Business* 63, 347–371.

Harvey, Campbell R., Karl V. Lins, and Andrew H. Roper, 2004, The Effect of Capital Structure When Expected Agency Costs are Extreme, *Journal of Financial Economics* 74, 3–30.

Hedges, Larry V., and Jack L. Vevea, 1998, Fixed- and Random-Effects Models in Meta-Analysis, *Psychological Methods* 3, 486–504.

Howton, Shawn D., Shelly W. Howton, and Steven B. Perfect, 1998, The Market Reaction to Straight Debt Issues: The Effects of Free Cash Flow, *Journal of Financial Research* 21, 219–228.

Jaffee, Dwight, and Joseph Stiglitz, 1989, Credit Rationing, *The Macmillan Press*.

James, Christopher, 1987, Some Evidence on the Uniqueness of Bank Loans, *Journal of Financial Economics* 19, 217–235.

Jensen, Michael C., 1986, Agency Costs of Free Cash Flow, Corporate Finance and Takeovers, *The American Economic Review*, 323–329.

Jensen, Michael C., and William H. Meckling, 1976, Theory of the Firm: Managerial Behavior, Agency costs and Ownership Structure, *Journal of Financial Economics* 3, 305–360.

Johnson, Shane A., 1995, Dividend Payout and the Valuation Effects of Bond Announcements, *Journal of Financial and Quantitative Analysis* 30, 407–423.

Johnson, Simon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2000, Tunneling, *The American Economic Review* 90, 22–27.

Johnson, W. Bruce, 1988, Debt Refunding and Shareholder Wealth: The Price Effects of Debt-for-Debt Exchange Offer Announcements, *Financial Review* 23, 1–23.

Jung, Kooyul, Yong-Cheol Kim, and René Stulz, 1996, Timing, Investment Opportunities, Managerial Discretion, and the Security Issue Decision, *Journal of Financial Economics* 42, 159–186.

Jung, Mookwon, 2009, Long-Term Equity and Operating Performances following Straight and Convertible Debt Issuance in the U.S, *Asia-Pacific Journal of Financial Studies* 38, 337–374.

Kane, Alex, Alan J. Marcus, and Robert L. McDonald, 1985, Debt Policy and the Rate of Return Premium to Leverage, *The Journal of Financial and Quantitative Analysis* 20, 479–499.

Kim, Yong Cheol, and RenéM. Stulz, 1988, The Eurobond Market and Corporate Financial Policy, *Journal of Financial Economics* 22, 189–205.

Klein, Paul-Olivier, and Laurent Weill, 2015, Is it Worth Issuing Bonds in China? Evidence from Stock Market Reactions, *Bank of Finland Discussion Paper*, Helsinki, Finland.

Klein, Paul-Olivier, Laurent Weill, and Christophe J. Godlewski, 2015, How Sukuk Shapes Firm Performance, Laboratoire de Recherche en Gestion et Economie (LaRGE), Université de Strasbourg.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 2000, Investor Protection and Corporate Governance, *Journal of Financial Economics* 58, 3–27.

MacKinlay, A. Craig, 1997, Event Studies in Economics and Finance, *Journal of Economic Literature*, 13–39.

Mikkelson, Wayne H., and M. Megan Partch, 1986, Valuation Effects of Security Offerings and the Issuance Process, *Journal of Financial Economics* 15, 31–60.

Miller, Darius P., and John J. Puthenpurackal, 2005, Security Fungibility and the Cost of Capital: Evidence from Global Bonds, *The Journal of Financial and Quantitative Analysis* 40, 849–872.

Miller, Merton H., and Kevin Rock, 1985, Dividend Policy under Asymmetric Information, *The Journal of Finance* 40, 1031–1051.

Modigliani, Franco, and Merton H. Miller, 1958, The Cost of Capital, Corporation Finance and the Theory of Investment, *The American economic review*, 261–297.

Modigliani, Franco, and Merton H. Miller, 1963, Corporate Income Taxes and the Cost of Capital: A Correction, *The American Economic Review* 53, 433–443.

Moerland, Pieter W., 1995, Alternative Disciplinary Mechanisms in Different Corporate Systems, *Journal of Economic Behavior & Organization* 26, 17–34.

Myers, Stewart C., 1977, Determinants of Corporate Borrowing, *Journal of Financial Economics* 5, 147–175.

Myers, Stewart C., 1984, The Capital Structure Puzzle, *The Journal of Finance* 39, 574–592.

Myers, Stewart C., and Nicholas S. Majluf, 1984, Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have, *Journal of Financial Economics* 13, 187–221.

Patell, James M., 1976, Corporate Forecasts of Earnings Per Share and Stock Price Behavior: Empirical Test, *Journal of Accounting Research* 14, 246–276.

Rahim, Norhuda Abdul, Alan Goodacre, and Chris Veld, 2014, Wealth Effects of Convertible-Bond and Warrant-Bond Offerings: a Meta-Analysis, *The European Journal of Finance* 20, 380–398.

Shyam-Sunder, Lakshmi, 1991, The Stock Price Effect of Risky versus Safe Debt, *Journal of Financial and Quantitative Analysis* 26, 549–558.

Stanley, T. D., 2008, Meta-Regression Methods for Detecting and Estimating Empirical Effects in the Presence of Publication Selection, *Oxford Bulletin of Economics and Statistics* 70, 103–127.

Stanley, T.d., Hristos Doucouliagos, Margaret Giles, Jost H. Heckemeyer, Robert J. Johnston, Patrice Laroche, Jon P. Nelson, Martin Paldam, Jacques Poot, Geoff Pugh, Randall S. Rosenberger, and Katja Rost, 2013, Meta-Analysis of Economics Research Reporting Guidelines, *Journal of Economic Surveys* 27, 390–394.

Stein, Jeremy C., 1992, Convertible Bonds as Backdoor Equity Financing, *Journal of Financial Economics* 32, 3–21.

Veld, Chris, and Yulia V. Veld-Merkoulova, 2009, Value Creation Through Spin-Offs: A Review of the Empirical Evidence, *International Journal of Management Reviews* 11, 407–420.

Wang, Kun, and Greg Shailer, 2015, Ownership Concentration and Firm Performance in Emerging Markets: A Meta-analysis, *Journal of Economic Surveys* 29, 199–229.

Notes

[1] 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”.

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

[3] 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

[4] 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.

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

Working Papers

Laboratoire de Recherche en Gestion & Economie

http://ideas.repec.org/s/lar/wpaper.html

Université de Strasbourg
Pôle Européen de Gestion et d'Economie
61 avenue de la Forêt Noire
67085 Strasbourg Cedex

http://large.em-strasbourg.eu/