



Bondholders' returns and stakeholders' interests

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Abstract

This study examines the relationship between firms' corporate social responsibility (CSR) or environmental, social and governance performance and bondholders' returns. We argue that bondholders are fixed claimants who only value firms' CSR performance in relation to firms' risks. We hypothesize that firms with CSR concerns or controversies tend to increase firms' default risk which would adversely affect bondholders' returns. We also argue that CSR investments (CSR strengths) increase the opportunity for residual claimants (i.e., shareholders) to shift the investment risk to the bondholders. Hence, CSR strengths represent higher asset substitution risk or risk-shifting. We argue that bondholders' returns and the stakeholders' interests are aligned when firms have CSR concerns or controversies but their interests are not aligned for CSR strengths since CSR strengths increase asset substitution risk for the bondholders. The alignment and misalignment between bondholders and stakeholders' interests are moderated by bond maturities and are affected by a negative shock in the credit market. Analysing a sample of 5240 bonds in a portfolio setting from 425 U.S. companies during the pre-green bond era (2001–2014), we find evidence to support our hypotheses.

Keywords Bondholder returns · CSR concerns and controversies · CSR strengths · Fixed claimants · Stakeholders

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1 Introduction

Recent Business Roundtable attended by 181 top executives of U.S. firms indicate that the main objective of the firm is going beyond the shareholders' objective (Freeman et al. 2021; Dmytryiev et al. 2021; Fitzgerald 2019). The firms' corporate social responsibility (CSR) activities, which represent corporate actions toward social good (i.e., social norms, ethics and philanthropic activities), beyond the interests of the firm and what is required by law (Carroll 1979; McWilliams and Siegel 2001), has become the front and centre of top managers' attention. In response to an increasing demand in the ESG funds in recent years, fund managers began to integrate firms' environmental, social and corporate governance (ESG) scores, which are derived from assessments of firms' CSR activities assessed by independent rating agencies (i.e., MSCI, Refinitiv, Bloomberg, etc.), into their investment selection criteria.¹ As ESG funds are growing at an unprecedented rate and maximizing the shareholder value is no longer the main objective of corporate managers, our study focuses on examining the value relevance of firms' CSR performance for one of investing groups that has received less attention, the bondholders.

While extant literature has documented that shareholders' return is positively related with firms' CSR performance (e.g., Clark et al. 2015; Edmans 2011; El Ghouli et al. 2011; Friede et al. 2015; Kempf and Osthoff 2007), we argue that bondholders have different interests with respect to firms' CSR performance than the shareholders. Literature has shown that firms' CSR performance reduces firms' risk and risk taking (Albuquerque et al. 2019; Godfrey et al. 2009; Harjoto and Laksmama 2018; Oikonomou et al. 2014; Vishwanathan et al. 2020), specifically firms' default risk (Bae et al. 2018; Hsu and Chen 2021; Jiraporn et al. 2014; Sun and Cui 2014; Xu et al. 2020). Since bondholders are more concerned about the firms' default risk, a reduction on firms' default risk from firms' CSR investments (CSR strengths) create a risk and return trade-off that simultaneously decreases the returns to bondholders. However, the bondholders' ability to collect their fixed claims also depend on the risk that occurs after they have invested in corporate bonds. Therefore, while CSR strengths could reduce firms' default risk, the bondholders are also averse to CSR strengths because any investments in CSR may increase the future residual payoffs toward the residual claimants at the expense of higher risk to the bondholders, also known as the risk-shifting or asset substitution risk (Jensen and Meckling 1976; Merton 1974; Leland 1994).

Hence, the intriguing question emerges, if all stakeholders—corporate borrowers on the behalf of their shareholders, the lenders (i.e., bondholders) and non-investing stakeholder (i.e., customers, employees, etc.)—could have aligned interests from firms' CSR investments. This may be possible despite lower bond yield at bond issuance (due to lower firms' risk from CSR investments) being immediately translated into a lower return for bondholders, because the actual realized returns to bondholders also depend on the actual risks, which are affected by firms' CSR activities, throughout the duration of bond maturities. The riskiness of corporate bonds throughout the duration of bond maturities can be

¹ Since firms' ESG scores is derived from firms' CSR activities, we use the terms ESG and CSR interchangeably (Gillan et al., 2021).

assessed based on bond price changes, resulting in regularly observable bond total returns (yields) from the bond secondary markets trading data. Using such bond returns data allows us to study whether firms' effort to align with stakeholders' interests measured by CSR ratings is beneficial for realized bondholders' returns despite its effect of lowering bond yields, which reduces companies' cost of debt and also decreases bondholders' returns.

Whereas previous research has documented the relationship between firms' CSR performance and cost of debt (Bae et al. 2018; Du et al. 2017; Ge and Liu 2015; Goss and Roberts 2011; Oikonomou et al. 2014) and trade credits (Xu et al. 2020), we are not aware of a single study that examines the direct relationship between bondholder abnormal returns and firms' CSR performance using the bond trading data.² This gap is particularly surprising since companies issued more bonds than equity financing. Global bond issuance exceeded \$15 trillion and dwarfed equity issuance by a ratio of more than ten to one in each year during the past decade.³ The US bond market, in particular, represents over 40% of the world bond markets. Despite the market turbulence during 2020 due to COVID-19, corporations have raised approximately \$2.5 trillion from the US bond market, which represents almost 50% increase in the year-over-year of new bonds issued.⁴ Hence, there is no doubt that fixed income investors, i.e., bondholders, represent more crucial capital providers for corporations than shareholders. Yet, most research studies focus on the relationship between firms' CSR performance and equity returns from the shareholders' perspective (Clark et al. 2015; Edmans 2011; El Ghouli et al. 2011; Friede et al. 2015; Kempf and Osthoff 2007; Harjoto et al. 2019).

Using a sample of 5240 corporate bonds actively traded in the secondary markets of 425 U.S. companies during the pre-green bond era (2001–2014),⁵ we find that the abnormal returns for bonds issued by companies with (no) CSR concerns or with (no) CSR controversies are significantly (positive) negative. Therefore, we find evidence for the underperformance of bondholders of firms with irresponsible behaviour that increases the firms' default risk and vice versa. In this case, the bondholders and the stakeholders' interests are aligned.

We also find the abnormal returns for bonds issued by firms with no CSR strengths are significantly positive while the abnormal returns for bonds issued by firms with CSR strengths are either insignificant or negative. These findings indicate that while CSR strengths could potentially reduce firms' default risk, the presence of CSR strengths

² There is a small group of indirect studies utilising socially responsible fixed income mutual funds as vehicle to infer a relationship between bondholder returns and CSR (Derwall & Koedijk, 2009; Henke, 2016; Leite & Cortez, 2018; Pereira et al., 2019; Salvi et al., 2020). These studies, however, inevitably mingle the performance of the fixed income portfolio manager with the returns received from high or low CSR bonds. In other words, they inform the question if the average fixed income portfolio manager has sufficient skill to achieve abnormal returns from socially responsibly marketed portfolio management strategies rather than the question if bonds of high or low CSR rated corporations are naturally (i.e. without portfolio manager influence) delivering returns that align more or less with bondholder interests, respectively.

³ See <https://www.sifma.org/resources/research/fact-book/>.

⁴ See <https://www.sifma.org/wp-content/uploads/2017/05/sifma-fact-book-2016.pdf> and <https://www.sifma.org/wp-content/uploads/2021/01/US-Research-Quarterly-Fixed-Income-Issuance-Trading-2021-01-15-SIFMA.pdf>.

⁵ Actively traded corporate bonds are bonds that are already traded in the secondary markets. They differ from the primary market where the bonds are issued for the first time. The secondary markets determine the prices of actively traded bonds based on the market supply and demand for the corresponding bonds and they are traded sufficiently often so that time varying (i.e., non-stale) prices are quoted similar to stocks in the equity markets.

increases potential of asset substitution risk or risk-shifting such that bondholders' returns are adversely affected by CSR strengths. As sensitivity analysis, we find that the abnormal returns for bonds issued by companies with no CSR strengths, no CSR concerns and no CSR controversies (all together) are significantly positive compared to negative abnormal returns for CSR concerns, CSR controversies or CSR strengths portfolios. This indicates that the bondholders' abnormal returns are higher in absence of both firms' default risk and asset substitution risk.

Furthermore, we examine the moderating effect of bond maturity and find evidence that the abnormal returns for bond portfolio with longer maturities (10+ years) with (no) CSR concern or with (no) CSR controversies or with (no) CSR strengths are not statistically significantly positive or negative. This indicates that longer bond maturity moderates the relationship between bondholder returns and CSR since bondholders who hold longer maturity bonds are less singularly concerned with firms' risks and might appreciate corporate risk taking insofar as this supports corporate longevity towards the bond maturity date. Existing literature has also demonstrated that the benefits from CSR investments (CSR strengths) are generally realized over the long run (Barnett 2007; Flammer and Kacperczyk 2016; Porter and Kramer 2006; Shiu and Yang 2017). Consequently, bondholders who hold longer maturity bonds are less concerned with the long-term nature that CSR strengths could generate to the firms' economic profits. Hence, the misalignment between bondholders' interest and stakeholders' interests with regard to CSR investments dissipates for bonds with longer maturities. Therefore, we argue that the alignment and misalignment with the stakeholders' interests are weaker for longer maturities bonds, as the long-term oriented bondholders who hold bonds with longer maturities have less clear cut as whether they represent fixed or residual claimants of the firms' economic profits.

We also examine the impact of exogenous shock in the credit market during the 2007 financial crisis and find that the abnormal returns for bonds issued by firms with no CSR strengths or no CSR strength, no CSR concerns and no CSR controversies are more significant after the 2007 financial crisis compared to the pre-2007 crisis. This implies that bondholders' aversion toward asset substitution risk has increased and therefore the misalignment between the bondholders' interests and the stakeholders' interests are stronger after the negative exogenous shock in the credit market, the 2007 financial crisis.

2 Hypothesis development

2.1 Bondholders' returns and firm risks

Extant literature recognized that bondholders represent a group of stakeholders with fixed claims of companies' economic profits. Merton (1974) indicates that in absence of the risk, a bond is priced based on fixed payments that exhibit non-stochastic (non-random) characteristics. Lehn and Poulsen (1991) state that "bondholders receive fixed claims that entitle them to the repayment of their principal at a specified maturity date and periodic coupon payments" (p. 649). Legally, bondholders value their securities based on the likelihood of receiving fixed claims and they are not in a position to direct or control the affairs of the corporation or to reap residual profits of the firm (Harvey 1991; McDaniel 1986).

Based on the contract theory (Asher et al. 2005; Williamson 1979), Barney (2018) explains that a stakeholder group is considered as a fixed claimant if it has "a fixed claim when payments for making their resources available to a firm do not vary with the actual

economic profits generated by a firm ex post" (p. 3308). Bondholders receive periodic fixed coupon payments and a lump sum principal payment at the maturity dates, the bond covenants are determined ex-ante and they do not receive ex-post residual economic profits. Therefore, bondholders fit the definition of the fixed claimants and their interests are different from the shareholders (DeBoskey et al. 2021). Furthermore, Barney (2018) also indicates that the fixed claimant stakeholder "will generally be very risk averse with regard to the strategies they would like a firm to pursue. In particular, they will typically prefer that firms pursue strategies that reduce the probability of bankruptcy" (p. 3319). This definition further confirm that the bondholders exhibit greater risk aversion than the shareholders.

Literature has documented that corporate social irresponsibility has been positively associated with increased firms' financial risk (Karpoff et al. 2017; Kölbel et al. 2017; Lange and Washburn 2012). Consistent with extant literature (Godfrey et al. 2009; Groening and Kanuri 2013; Lenz et al. 2017; Price and Sun 2017), we operationalize the firms' corporate social irresponsibility with CSR concerns or CSR controversies. Specifically, we argue that bondholders, as fixed claimants with ex-post claims are quite averse to risk, they perceive firms with CSR concerns or CSR controversies as greater risk, especially the default risk. Therefore they tend to be less inclined to invest in bonds that are issued by firms with CSR concerns or CSR controversies. CSR concerns or CSR controversies increase the current risk of bankruptcy that reduces the likelihood of bondholders receiving their future fixed claims.⁶ In this case, bondholders are averse to firms' current risk to secure their future expected fixed payoffs. Thus, greater firms' current default risk adversely affect bondholders' future expected fixed payoffs. Our first hypothesis is stated as the following:

Hypothesis 1 (H1) Bondholders' abnormal returns are lower (higher) for firms that (do not) engage in socially irresponsible actions.

Extant literature has also recognized that the bondholders tend to have a higher level of risk aversion not just toward the firms' current risks but also toward firms' future risks from firms' investments. Jensen and Meckling (1976) indicate that the differing incentives and risk tolerance between bondholders and shareholders are due to the shareholders' ability to collect firms' profit, while bondholders face high monitoring costs and have no variable upside payoffs to compensate for higher future expected bankruptcy risks. Myers (1977) further explains that shareholders have greater incentives for firms to take on risky project opportunities that potentially can produce greater profits by replacing old assets with newer ones but simultaneously increasing the future risk of bankruptcy. In other words, firms which take on riskier projects shift (i.e., distribute) risk from shareholders to

⁶ As with any study of returns in equity or fixed income and CSR, we implicitly assume in our hypothesis that the bond secondary market displays inefficiencies with regard to the information contained in the CSR data during our sample period. A firm's CSR assessments would have informed bond investors to understand the future (expected) riskiness of a bond before the mainstream market did. In other words, we implicitly assume that CSR informed bondholders (not) to invest in bonds of firms (with) without concerns or controversies, as they assume these to be (riskier) less risky than understood by the mainstream market. Once the expected risk materialises to a (higher) lower extent than expected by the mainstream market, the prices of the bonds (with) without concerns or controversies (fall) rise resulting in a (negative) positive abnormal return. Similarly with respect to CSR strengths. Evidence of such potential market inefficiencies in the secondary markets during our sample period has been documented by Kempf and Osthoff (2007) and Borgers et al. (2015).

the bondholders. This risk-shifting (asset substitution risk) increases the likelihood of large returns for shareholders and also the likelihood of expected future bankruptcy risk for the bondholders (Harris and Raviv 1991; Leland 1994). Thus, the bondholders prefer to take on less risky projects to increase the likelihood of the firm's ability to repay its future coupons and principal payment obligations.

Barney (2018) also recognizes that "fixed claimants, because they do not share in any profits generated by a firm, will generally be very risk averse with regard to the strategies they would like a firm to pursue" (p. 3319). More importantly, the residual claimant stakeholders are most likely to reap the benefits of CSR investments. Therefore, bondholders as fixed claimants, are more averse to CSR investments since such investments create greater potential asset substitution risk from the stakeholders to the bondholders.

While CSR investments (CSR strengths) could reduce the firms' current default risk (Harjoto 2017; Wang et al. 2017), there is an increase the asset substitution risk from CSR investments because such investments represent risk-shifting (asset substitution risk) from shareholders to bondholders. In this scenario, the reduction in firms' current default risk from CSR strengths is offset with an increase in the asset substitution risk from CSR strengths. Hence, the bondholders' abnormal returns could be lower if they are facing greater risk-shifting relative to the current default risk reduction from CSR strengths because their future claims are fixed. We operationalize firms' CSR investments with CSR strengths (firms have at least one CSR strength score and no CSR concerns and no CSR controversies) and argue that bondholders' abnormal returns are lower for firms with CSR strengths due to greater risk-shifting. In contrast, the risk-shifting is absent for firms with no CSR strengths, and therefore bondholders' abnormal returns are higher for firms with no CSR strengths. We form our second hypothesis as the following:

Hypothesis 2 (H2) Bondholders' abnormal returns are (higher) lower for firms that (do not) engage in CSR investments.

2.2 Bondholders' returns and bond maturities

Naturally, bondholders who hold longer maturity bonds are not only concerned with the short-term risks but also about their long-term ex-post claims. Literature has also documented that shorter maturity bonds are associated with greater information asymmetry, greater agency cost of debt and higher risk, while firms that are able to issue bonds with longer maturities generally have more steady cash flows, lower information asymmetry and more importantly it has lower agency cost of debt (Barclay and Smith 1995; Custodio et al. 2013; Huang and Zhang 2019; Huang et al. 2019; Myers 1977). Consistent with Jensen and Meckling (1976), lower agency cost of debt implies that bondholders' risk avoidance is lower.⁷ Hence, we expect the moderating effect of bond maturity on the relationship between firms' CSR (i.e., concerns or controversies or strengths) and bondholders' returns.

Taking an example of a British console bond, which has an unlimited maturity date, bondholders' risk tolerance of a console bond becomes more similar to the shareholders

⁷ Bondholders prefer to take on less risky projects to increase the likelihood of the firm's ability to repay its debts. As the firm takes on less risky projects and forgo riskier projects, the residual profits for the residual claimant stakeholder are lower. Jensen and Meckling (1976) indicate this bondholders' risk avoidance by forgoing the potential payoffs from risky investments as the agency cost of debt.

since their ultimate goal is to receive a continuous periodic coupon payment forever. If the company ceases to exist, the console bondholders will lose their long-term fixed coupon payments claim. Since company must take some risks in order to continue to exist, even though the bondholders are still considered as fixed claimants, the bondholders of bonds with longer maturities who are now more concerned about long-term ex-post claims, are less averse to firms' risks such that their interests are more aligned with the stakeholders. In other words, bondholders who hold longer maturity bonds are less singularly concerned with both firms' risks from adverse events (CSR concerns or CSR controversies) and from asset substitution (CSR strengths) and they might appreciate corporate risk taking insofar as this supports corporate longevity towards the bond maturity date.

Drawing from these existing literatures and this example of a console bond, we argue that bondholders who hold bond portfolios with longer maturities tend to have greater risk tolerance toward the firms' risk and risk-shifting. First, we argue that longer bond maturities attenuate the negative impacts of corporate social irresponsibility actions on the bondholders' abnormal returns and the positive impacts of absence in corporation social irresponsibility. Second, CSR studies have indicated that CSR investments are considered as firms' strategy to generate a sustained competitive advantage. However, the payoffs (benefits) of CSR investments carry uncertainties and can often be realized over a long period of time (Barnett 2007; Flammer and Kacperczyk 2016; Porter and Kramer 2006; Shiu and Yang 2017). Hence, we expect that bond maturity is acting as the moderating factor for the negative impact of firms' default risk in form of CSR concerns or controversies, asset substitution risk in form of CSR investments (CSR strengths) and the positive impacts from the absence of CSR concern, controversies and/or strengths on bondholders' abnormal returns. We form our third set of hypotheses as the followings:

Hypothesis 3a (H3a) The relationship between bondholders' abnormal returns and firms' engagement in socially irresponsible actions is weaker for bonds with longer maturities.

Hypothesis 3b (H3b) The relationship between bondholders' abnormal returns and firms' CSR investments is weaker for bonds with longer maturities.

2.3 Bondholders' returns and a negative shock in the credit market

A negative exogenous shock in the credit market has a significant impact on bondholders' risk aversion. Literature has shown that when bond default risk increases, bondholders' risk aversion increases as well (Kim et al. 1993; Merton 1974). Recent literature has documented that the 2007 financial crisis has brought a significant systemic increase in bond default risks (Dick-Nielsen et al. 2012; Flammer and Ioannou 2020; Flannery and Bliss 2019; Friewald et al. 2012). Dick-Nielsen et al. (2012) demonstrate that the bond spreads, defined as the difference between bond yields of a bond with average liquidity and a very liquid bond, have increased significantly during the post-2007 period. Flammer and Ioannou (2020) indicate that the 2007 financial crisis creates a systemic exogenous shift in the credit market that significantly affects firms' investments in key strategic resources. Friewald et al. (2012) show that approximately 14% of the corporate bond yield spread changes during the 2007 crisis is due to the liquidity changes in the bond markets. Flannery and Bliss (2019) indicate that new regulatory changes are needed after the 2007 crisis to curb the upward shift in the bond default risk. However, the implementations of these changes are still in progress.

Using the 2007 financial crisis as an exogenous negative shock in the credit market, we split our overall sample period into two subsamples: a subsample period of January 2001 to December 2007 and a subsample period of January 2008 to December 2014, to represent pre- and post-financial crisis periods. We argue that the bondholders' risk aversion is heightened after the exogenous negative shock of the 2007 financial crisis. More importantly, we argue that as the bondholders' risk aversion increases after the negative shock, this upward shift in the bondholders' risk aversion significantly strengthens the bondholders' negative (positive) attributions to bonds issued by firms displaying (no) CSR concerns or (no) CSR controversies that represent higher (lower) firms' risk and firms conducting investments in (no) CSR strengths that increases (decreases) the likelihood of risk-shifting. Therefore, we expect that the alignment and misalignment between the bondholders' interests and the stakeholders' interests are stronger after the 2007 crisis due to a systemic increase in bondholders' aversion toward risks. Thus, we state our fourth set of hypotheses as the following:

Hypothesis 4a (H4a) The relationship between bondholders' abnormal returns and firms' engagement in socially irresponsible actions is stronger after an exogenous negative shock in the credit market.

Hypothesis 4b (H4b) The relationship between bondholders' abnormal returns firms' CSR investments is stronger after an exogenous negative shock in the credit market.

3 Data and measurements

3.1 Sample formation

This study starts with a sample of bonds issued by the US companies that are identified in the MSCI World lists of standard, small cap, mid cap, and large cap from 1998 to 2014.⁸ We conclude our sample in 2014, as the large-scale issuance of green bonds from 2015 onwards, i.e., hundreds of corporate green bond issuances per year (Flammer 2021), is likely to have impacted bondholders' demand for "normal" bonds with good CSR ratings. Based on these lists, we commence with an initial sample of 5000 unique US companies. We exclude financial institutions or banks or real estates from the sample because banks, financial institutions and real estate are financed mostly with debt and therefore, the number of bonds and different tranches and seniority issued by companies in financial industry are substantially higher compared to other industries. Thus, their presence in the sample would drive our results and significantly decrease the cross-industrial variability (Oikonomou et al. 2014). Then we match this sample with sample of over 3000 firms in the MSCI ESG (KLD) Stats database.

Refinitiv's Datastream is used to retrieve the company's bond traded in the secondary markets. The company identifiers from the lists are used to manually search for related bonds in Refinitiv's Datastream. If a company identifier is linked to any bonds, this will

⁸ Commencing our sample selection strategy from the MSCI World ensures that all our sample firms have not only issued listed bonds but are also listed on equity markets. This is important in the context of CSR assessments to ensure that all disclosed information in a broadly equivalent manner.

show up under “related securities” link when conducting this search. Pressing this link will generate a list of all the fixed income securities available for this identifier, which could then easily be downloaded. If nothing is displayed under related securities, then the company had not issued any bonds, or they are not covered by Refinitiv’s Datastream. These lists of bonds are downloaded for all companies where available and include among other information the name, identifier, start date, history, category, type, and currency.

These lists of bonds include a wide variety of different types of bonds, such as convertibles, callable, puttable, and exchangeable, with varying maturities. This paper further investigates the differences of these types of bonds in terms of risk structure. Additional static bond data and bond ratings from S&P is retrieved from Refinitiv’s Datastream. Cases where there are different ratings being issued on the same day, for different bonds, but from the same company, we investigate to see which characteristics of the bonds determine these differences, resulting in 615 cases over the full sample period. This investigation finds that in 30% of the cases, the difference is due to differences in remaining maturity. In 20% of the cases, the differences appear to be due to amortisation differences and embedded options such as callable and puttable. For the remaining cases, the reason for the difference in bond ratings cannot be determined as it appears to be due to a variety of reasons. As a consequence of these observations, along with the findings of previous studies, this paper excludes bonds with nonstandard characteristics, such as convertibles, callable, puttable or bonds with any other embedded options, sinking funds, floating rate notes, exchangeable bonds, hybrids, warrant, and index-linked bonds (Campbell and Taksler 2003; Oikonomou et al. 2014). This resulted in a survivorship bias adjusted final sample of 5240 bonds issued by 425 unique US companies. Monthly total bond return data inclusive of distributions and market values are downloaded in USD from Refinitiv’s Datastream for the bonds for the sample period January 2001 to December 2014.⁹

3.2 CSR performance measures

To measure firms’ CSR performance of the companies in the sample, this paper uses ratings from Kinder, Lydenberg, and Domini (KLD), which is known as MSCI ESG Stats. This KLD rating has been one of the most widely used CSR ratings among investment managers and researchers (Barnett and Salomon 2012; Bird et al. 2007; Chatterji et al. 2016, 2009; Deckop et al. 2006; Flammer and Ioannou 2020; Flammer et al. 2019; Gregory et al. 2014; Hillman and Keim 2001; Kempf and Osthoff 2007; Statman and Glushkov 2009). KLD started its ratings in 1991 initially covering approximately 650 companies, which consisted mainly of S&P 500 and Domini 400 companies. By 2001, KLD expanded its coverage to approximately 1100 companies as it included companies listed in the Russell 1000 index. The coverage further expanded in 2003 to approximately 3100 companies by further including the Russell 3000 index. To assess the companies, KLD uses information both external and internal to the company which, includes anything from direct meetings with the company to newspaper articles (Flammer et al. 2019; Oikonomou et al. 2014).

⁹ Total return data is preferred relative to bond price as it takes into account capital gains and any periodic coupon payments made. Using normal bond prices could lead to an underestimation of total bond returns. The reason for starting in 2001 is that from that point KLD introduced a substantial larger coverage, by incorporating companies listed in the Russell 1000 index.

The KLD assesses companies on ESG issues for both strengths and concerns in seven separate inclusionary categories: community activities, diversity, employees' relations, environmental record, product quality, human rights, and corporate governance. The ratings are updated annually and are structured on a point-by-point basis. For example, in a year a company might have four environmental strengths and one environmental concern. With each of the seven categories, there are several sub-categories for both strengths and concerns. Apart from these seven categories, KLD also assesses companies on controversial business issues (Alcohol, Gambling, Tobacco, Firearms, Military, and Nuclear Power). These KLD exclusionary or controversies categories differs from the inclusionary categories as controversial business issues only have CSR concerns, as they primarily represent negative CSR screens (CSR controversies).

Following previous studies (e.g., Kempf and Osthoff 2007), this paper included a new sub-category as soon as it was introduced, and dismissed a sub-category as soon as it was removed by KLD and hence the analysis was always based on the latest ratings which were available to investors. This paper follows the approach by previous studies and exclude the corporate governance category. The reason for this exclusion is due to the fact that in 2002, corporate governance category was constructed by changing the name of the category "Other" without changing its sub-categories. Additionally, researchers have argued that KLD measures for corporate governance considerably differently from the general corporate governance literature (Beiner et al. 2006; Gregory et al. 2014; Kempf and Osthoff 2007; Kim et al. 2012). Therefore, we exclude corporate governance measures to construct our CSR scores.

To compare CSR performance across companies, the KLD scores across six different inclusionary categories (community, diversity, employees, environment, product, and human rights) are aggregated. Following the literature, we argue CSR concerns and strengths represent different construct (Chatterji et al. 2009; Mattingly and Berman 2006), the concerns and strengths in each inclusionary category is aggregated separately to achieve overall strengths scores and concerns scores for each category. Then, the concerns scores and strengths scores across all six categories are aggregated into CSR strengths scores and CSR concerns scores.

In line with the treatment versus the control group design in medical studies and previous CSR literature in equity markets (Kempf and Osthoff 2007; Statman and Glushkov 2009), we build treatment group as portfolios of firms with certain CSR characteristics and corresponding control groups as portfolios of firms which do not exhibit these characteristics. First, we build a portfolio of bonds from firms with CSR concerns as "CSR concerns" portfolio. Reversely, we form a portfolio of bonds from firms with no CSR concerns as "no CSR concerns" portfolio. Second, we curate a portfolio of bonds from firms with CSR strengths as "CSR strengths" portfolio and, reversely, categorize a portfolio of bonds from firms with no CSR strengths as "no CSR strengths" portfolio. Third, the controversial business issues (CSR controversies) portfolio includes bonds from companies involved in at least one controversial business defined in the KLD exclusionary categories (Alcohol, Gambling, Tobacco, Firearms, Military, and Nuclear Power). We categorize a portfolio of bonds from firms with CSR controversies as "CSR controversies" portfolio and categorize a portfolio of bonds from firms with no CSR controversies as "no CSR controversies" portfolio. We also examine the portfolio of bonds from firms with no CSR strengths, no CSR concerns and no CSR controversies as "No strengths, No concerns and No controversies"

as our sensitivity analysis portfolio to control for potential interactions between the CSR characteristics. In addition to these, the same portfolios are constructed where the bonds are split into different maturity buckets: 0–1 year (0–1y), 1–5 year (1–5y) and 5–10 year (5–10y) and more than 10 years (10+y) of remaining maturity.¹⁰

3.3 Fixed income portfolio measure

The portfolios are created and rebalanced annually. KLD ratings are reported at the end of each year. Hence, portfolios are constructed at the beginning of year t that are based on the KLD ratings reported at the end of year $t-1$. This portfolio is then held until the end of year t . Rankings are based on those companies that had bonds in that particular year. All bonds available from the same company in a particular year are first value weighted to create one time series of bonds to represent the return of each company in each year. This approach assumes bond investors rebalance the portfolio on a yearly basis. Investors include firms in the portfolio with certain CSR criteria (e.g., firms' bonds with CSR concerns only, no CSR concerns, CSR controversies, no CSR controversies, CSR strengths only, no CSR strengths and no CSR strength, no concerns and no controversies) based on value-weighted method. These time series are then used to construct value-weighted portfolios used for the main analysis in this paper based on Eq. (1):

$$r_{Pr}^{vw} = \ln \left[\sum_{i=1}^N \frac{MV_{i,t-1}}{\sum_{i=1}^N MV_{i,t-1}} r_{i,t} \right] \quad (1)$$

Equation (1) shows that the value weighted return of a portfolio in month t (r_{Pr}^{vw}) over a m -month holding period is a weighted average of the month t returns on all bonds i in the portfolio with the weights determined by the market values of the bonds at the start of the month. The natural logarithm of the summation is then taken to create the appropriate return.

The US 3-month T-bill is retrieved from Refinitiv's Datastream to represent the risk-free rate for the portfolios throughout this paper. The three-month T-bill describes thirteen weeks return but is stated annually by convention. Hence, we convert it to the precise monthly rate by arithmetically transforming the annual stated rate into a thirteen week rate, which we then geometrically adjust to a monthly length using an average year of 365.25 days to account for leap years. To ensure time additivity of our risk-free rate in line with our portfolio returns, we transform the result into a log return.¹¹

4 Methodology

This paper is applying a nine-factor model to measure the financial performance of the portfolios. This nine-factor model is an extension of the Elton et al. (1995) four-factor model which has been widely used and influential in previous bond studies (Cici and

¹⁰ The classification of remaining maturity of the bonds are rebalanced quarterly. The 5-year intervals have been used in previous studies (Oikonomou et al., 2014) and it seemed as a reasonable break. For example, looking at Barclay's bond indexes https://index.barcap.com/Benchmark_Indices/Aggregate/Bond_Indices you will see some clustering around 5 year and 10 years. This should not prove to be very important for the analysis.

¹¹ Precisely, we employ the following equation: $R_{f,t,1m} = \ln \left((1 + SR_{f,t,3m} \frac{91}{365.25})^{\frac{30.4375}{91}} \right)$

Gibson 2012; Derwall and Koedijk 2009; Henke 2016; Huij and Derwall 2008; Moneta 2015). This model consists of a market factor constructed of the excess return of a broad bond market index to take into account exposure to the broad bond market. It also includes a default factor constructed as the as the excess return on a high yield index to take into account any exposure to the high yield market. It further includes an option factor, which consists of the excess return of a mortgage index to cover any exposure to both the market for securitised debt, and bond option characteristics. It also includes an equity factor, which is constructed as the excess return of an equity index to take into account any exposure to the equity market.

We also use an enhanced version of the Elton et al. (1995) model, where five further factors are integrated into the model. First, a duration factor is integrated, constructed as the return difference between a long and short-term government bond index to cover the term structure slope that specifies the outlook of market participants with respect to changes in interest rates over time. Second, a global bond factor is introduced to the model. This factor is constructed as excess return of a global broad investment grade bond index to cover any exposure to the global bond market. In a globalised interconnected world, bonds in general are expected to have a great exposure to the global bond market as many bonds are traded globally and domestic and foreign participants trade bonds in various bond markets. The global bond index is expected to be highly correlated with the domestic bond index. This paper follows the orthogonalization approach of Elton et al. (1993) and Hoepner et al. (2011) to conduct a precise statistical correction of this problem. The cleaned global factor produced by regressing the return of the global index on the domestic index is then only capturing global specific return characteristics.¹² Third, bonds in general inherent an exchange-rate risk, which has been highlighted in the literature (Detzler 1999; Gallo et al. 1997; Polwittoon and Tawatnuntachai 2006; Solnik and McLeavey 2013). As a result, we integrate three exchange rate factors into the model to take into account the exposure to the three most tradable currencies after the USD: Euro (EUR:USD), British Pound (GBP:USD), and Japanese Yen (YEN:USD).¹³

Existing studies have shown that industry membership can have an important influence on CSR scores (Edmans 2011; Gregory et al. 2016). Therefore, we also include the nine Industry Classification Benchmark (ICB) industry classification, which is consistent with the MSCI ESG industry classifications (<https://www.msci.com/gics>). These factors are created by taking the value weighted average of bonds issued by companies in the sample of this paper belonging to the respective industry classification. These factors are expected to be highly correlated to the main market factor. Thus, we follow the orthogonalization approach of Elton et al. (1993) and Hoepner et al. (2011) to conduct a precise statistical correction of this problem. The cleaned industry factors produced by regressing the return of the industry portfolio on the market factor is then only capturing industry specific return characteristics.¹⁴

¹² The method is performed by running a regression of the global index against the domestic index. A new index is then created by the sum of the intercept and the residuals of the regression. This results in a correlation of the new orthogonalized global index and the domestic index of asymptotically zero.

¹³ These exchange rates are structured as: X USD for 1 EUR/GBP/YEN. The exchange rate factors are integrated in the model as the continuously compounded monthly return.

¹⁴ The method is performed by running a regression of each value weighted industry portfolio against the main bond market factor in the model. A new index is then created by the sum of the intercept and the residuals of the regression. This results in a correlation of the new orthogonalized global index and the domestic index of asymptotically zero.

Table 1 Descriptive statistics of across the portfolios

Portfolios	Mean return (%)	Std. dev (%)	Sharpe ratio (%)	Semi std. dev (%)	Sortino ratio (%)
CSR concerns	0.47	1.32	0.26	0.98	0.35
No CSR concerns	0.54	1.38	0.29	1.03	0.40
CSR controversies	0.47	1.46	0.23	1.09	0.31
No controversies	0.48	1.29	0.28	0.96	0.37
CSR strengths	0.47	1.32	0.26	0.98	0.34
No CSR strengths	0.55	1.36	0.31	1.01	0.41
No strengths, no concerns & no controversies	0.56	1.4	0.35	1.02	0.42

This table presents the descriptive statistics of the value weighted aggregated portfolios. Column one shows the portfolios. Column two to six displays mean excess return, standard deviation, Sharpe ratio, semi-standard deviation, and Sortino ratio respectively for each portfolio

Our nine-factor model plus nine ICB industry dummy variables (Industry Dummies) used to measure for the bond abnormal returns performance evaluation in this study is presented in Eq. (2):

$$R_{pt} - R_{ft} = \alpha_i + \beta_{1i} (Market_{mt} - R_{ft}) + \beta_{2i} Duration_t + \beta_{3i} Default_t + \beta_{4i} Option_t + \beta_{5i} Equity_t + \beta_{6i} Global_t + \beta_{7i} \text{€}_t + \beta_{8i} \text{£}_t + \beta_{9i} \text{¥}_t + \sum \beta_i Industry Dummies + \varepsilon_{it} \quad (2)$$

Bond investors employ the value-weighted portfolio bond returns minus the risk free return or US three-month T-bill ($R_{pt} - R_{ft}$) as the dependent variable in a nine-factor model and obtain the alpha (α_i), which is the intercept of the model as a measure of bondholders' abnormal returns during the entire calendar year of a rebalancing period.¹⁵ This method has been widely used in extant studies for examining abnormal returns for equity, such as Fama (1998) and Lyon et al. (1999). This process is also consistent with CSR-related studies using the calendar year time equity portfolio approach (e.g., Deng et al. 2013; Eccles et al. 2014; Edmans 2011; Kempf and Osthoff 2007). The remaining factors of the model use the US benchmark indices provided by Barclays Capital to represent the factors in the model. Barclays is one of the leading providers of fixed income indices and has a wide range of sub-indices representing US and Canadian, European, and Asian markets in addition to emerging markets and customized indices (Barclays 2016).

¹⁵ This calendar year portfolio approach differs from an event study method since we examine the value-weighted abnormal return during the entire calendar year of a rebalancing period as opposed to a short window (days) surrounding an event.

Table 2 Sample distribution across nine Industry Classification Benchmark (ICB)

ICB industry classification	Company break-down (%)	Bond breakdown (%)
Oil & gas	9.12	9.03
Basic materials	9.31	8.13
Industrials	17.32	17.60
Consumer goods	16.39	21.08
Health care	8.94	5.92
Consumer services	18.44	20.87
Telecommunications	2.42	2.45
Utilities	11.55	10.20
Technology	6.52	4.72

This table shows the nine ICB industry classifications used in this paper. Column one shows the names of the industries. Columns two and three display the company and bond breakdown within these industries from the sample used in this paper

5 Empirical results

5.1 Descriptive statistics

Table 1 reports the descriptive statistics for the value-weighted aggregated portfolios. This Table 1 includes statistics for the mean excess return (Mean return), standard deviation (Std. Dev), Sharpe ratio, semi-standard deviation (Semi Std. Dev) and Sortino ratios all our portfolios. Table 1 shows that, on average, the portfolios for 'No Concerns', 'No Controversies', 'No Strengths', and 'No Strengths, No Concerns and No Controversies' (as sensitivity analysis) display superior means of annualized excess returns (0.54%, 0.48%, 0.55%, 0.56% respectively) compared to the portfolios with CSR Concerns, with CSR controversies and with CSR strengths (0.47%, 0.47% and 0.47% respectively). More importantly, the same portfolios show stronger reward-to-risk ratios both when considering Sharpe ratios (i.e., mean excess return divided by its standard deviation) and Sortino ratios (i.e., mean excess return divided by its semi-standard deviation). Overall, the descriptive statistics yield higher mean excess returns and much stronger reward-to-risk ratios for the portfolios with bonds issued by companies with no CSR concerns, no CSR controversies, no CSR strengths, and also no CSR strengths, no CSR concerns and no CSR controversies all together.

As banks and financial institutions are excluded from the sample, our sample does not contain any firms in the financials and real estate industry classifications. The distribution of our sample across nine industries is shown in Table 2. The majority of firms and bonds in our sample belong to the consumer services, industrials and consumer goods industries. The least represented industries in the sample are telecommunications and technology.

Table 3 Regression results for bondholders' returns and risks

Portfolios	CSR concerns	No CSR concerns	CSR controversies	No CSR controversies	CSR strengths	No CSR strengths	No strengths, no concerns & no controversies
Alpha	-0.78%*** [0.0004]	2.93%*** [0.0016]	-2.57%** [0.0265]	0.90%*** [0.0046]	-0.09% [0.7508]	1.89%* [0.0939]	2.52%*** [0.0011]
Market	0.98*** [0.0000]	1.08*** [0.0000]	1.06*** [0.0000]	0.98*** [0.0000]	0.99*** [0.0000]	1.06*** [0.0000]	1.04*** [0.0000]
Duration	0.02*** [0.0010]	-0.07*** [0.0003]	0.02 [0.2663]	-0.01* [0.0583]	0.01*** [0.0006]	-0.06*** [0.0000]	-0.05*** [0.0094]
Default	0.00 [0.7363]	0.01 [0.7381]	0.02 [0.3706]	0.00 [0.6844]	0.00 [0.7064]	0.01 [0.7482]	0.02 [0.5644]
Option	0.03 [0.1507]	-0.06 [0.2752]	0.06 [0.2967]	-0.03 [0.1083]	0.04** [0.0167]	-0.11* [0.0619]	-0.12* [0.0729]
Equity	-0.01** [0.0180]	0.02** [0.0275]	0.00 [0.7584]	0.00 [0.6877]	0.00 [0.2828]	0.02 [0.1221]	0.02* [0.0705]
Global	0.00 [0.8707]	0.02 [0.8062]	-0.01 [0.8395]	0.00 [0.9725]	0.00 [0.8741]	0.05 [0.4285]	0.01 [0.9096]
€	0.00 [0.5138]	-0.03 [0.2938]	0.00 [0.9177]	0.00 [0.6819]	0.01 [0.2369]	-0.04 [0.1167]	-0.01 [0.6271]
£	0.00 [0.7742]	0.02 [0.5012]	0.00 [0.7299]	0.00 [0.6422]	0.00 [0.7452]	0.01 [0.7685]	-0.01 [0.7522]
¥	0.00 [0.6326]	-0.01 [0.5064]	0.00 [0.7670]	0.00 [0.8263]	0.00 [0.4761]	-0.02 [0.2010]	0.00 [0.7959]
Oil & gas	-0.01 [0.7602]	0.07 [0.3814]	-0.00 [0.9058]	0.00 [0.9454]	-0.03 [0.1677]	0.13* [0.0914]	0.09 [0.3246]
Basic materials	0.02 [0.5260]	-0.03 [0.6168]	0.09 [0.5770]	-0.01 [0.7481]	0.01 [0.7829]	0.05 [0.4768]	0.14** [0.0327]
Industrials	-0.11*** [0.0000]	0.41*** [0.0000]	-0.30* [0.0000]	0.11** [0.0000]	0.01 [0.0000]	0.21 [0.0000]	0.29 [0.0000]

Table 3 (continued)

Portfolios	CSR concerns	No CSR concerns	CSR controversies	No CSR controversies	CSR strengths	No CSR strengths	No strengths, no concerns & no controversies
Consumer goods	[0.0005] - 0.03	[0.0036] 0.07	[0.0879] - 0.39**	[0.0184] 0.13**	[0.8195] 0.06	[0.2202] - 0.07	[0.1727] 0.05
Health care	[0.4883] - 0.02	[0.6030] 0.05	[0.0202] 0.00	[0.0147] 0.03	[0.2346] 0.03	[0.6357] - 0.08	[0.7936] - 0.05
Consumer Serv	[0.4915] - 0.15***	[0.6113] 0.32*	[0.9699] - 0.19	[0.3292] 0.11*	[0.3826] 0.00	[0.5281] 0.11	[0.6900] 0.21
Telecom	[0.0086] - 0.04**	[0.0676] 0.10***	[0.2787] - 0.06	[0.0626] 0.02	[0.9912] - 0.01	[0.6212] 0.01	[0.3741] 0.14**
Utilities	[0.0110] - 0.04*	[0.0056] 0.11	[0.2404] - 0.26**	[0.2360] 0.08***	[0.5309] 0.00	[0.9017] 0.05	[0.0103] 0.19
Technology	[0.0853] 0.01	[0.2443] - 0.04	[0.0161] - 0.03	[0.0069] 0.01	[0.8850] 0.05	[0.6048] - 0.11	[0.1291] - 0.09
Adj R ²	[0.7445] 99.60%	[0.4302] 95.71%	[0.7718] 96.21%	[0.7234] 99.58%	[0.1053] 99.55%	[0.1509] 94.49%	[0.3083] 93.79%

This table displays the regression results for the value-weighted aggregated portfolios using the nine-factor model with US benchmarks for the sample period January 2001 to December 2014. The first row shows the portfolios analysed. The second row shows the annualized alphas. The third row shows the market betas. Fourth to eleventh rows present the slope coefficients estimated by the model for Duration, Default, Option, Equity, Global, EUR (€), GBP (£) and YEN (¥). Twelfth to twentieth rows presents the slope coefficients estimated by the model for nine different ICB industries. Negative coefficients indicate exposure to the respective opposite investment style: short-term bonds for the Duration factor, and for the other factors the conceptual opposite. The last row displays the adjusted R-square for each portfolio. The p-value is reported in parenthesis [] under the coefficient. Coefficient covariances and standard errors are corrected for heteroscedasticity and autocorrelation based on Newey and West (1987). ***, **, and * represent statistically significant at 1%, 5% and 10% levels respectively

5.2 Regression results

This section discusses the regression results. All the tables presented includes the annualised alphas of the portfolios followed by the slope coefficients of each factor in the model. The p-value is reported in a parenthesis [] underneath the estimated coefficient.

5.2.1 Bondholders' abnormal returns and firm risk

Our basic regression results of the portfolios presented in Table 3 shows that the abnormal return for a portfolio of bonds issued by companies with CSR concerns is significantly negative ($\beta = -0.78\%$ and $p\text{-value} = 0.0004$). In contrast, the abnormal return for a portfolio of bonds issued by companies with no CSR concerns is significantly positive ($\beta = 2.93\%$ and $p\text{-value} = 0.0016$). Similarly, we find a portfolio of bonds issued by firms with CSR controversies (Controversies) has significantly negative abnormal return negative ($\beta = -2.57\%$ and $p\text{-value} = 0.0265$) and a portfolio of bonds for firms with no CSR controversies (No Controversies) has significantly positive abnormal return negative ($\beta = 0.90\%$ and $p\text{-value} = 0.0046$). The magnitudes of these abnormal returns (alphas) range between -2.57% to $+2.93\%$ per annum are economically significant¹⁶ compared to the averages of excess returns presented in Table 1. Thus, we find evidence to support our first hypothesis (H1) that bondholders' abnormal returns are (higher) lower for firms that (do not) engage in any socially irresponsible actions, measured by (no) CSR concerns or (no) CSR controversies. In this case, the bondholders and the stakeholders' interests are aligned.

Table 3 also displays the regression results for portfolios of bonds issued by firms with CSR strengths and no CSR strengths. We find that the abnormal return for a portfolio of bonds issued by firms with CSR strengths is negative but not statistically significant ($\beta = -0.09\%$ and $p\text{-value} = 0.7508$). This implies that the reduction of default risk from engaging in CSR strengths is completely offset with the increase in asset substitution risk from engaging in CSR strengths. We find that a portfolio of bonds issued by firms with no CSR strengths is positive and significant ($\beta = 1.89\%$ and $p\text{-value} = 0.0939$). The magnitude of the alpha for firms with no CSR strengths (1.89% per annum) is quite significantly larger relative to the mean of bond excess returns with no CSR strengths presented in Table 1. Overall, we find some evidence to support our Hypothesis 2 (H2) that bondholders' abnormal returns are higher in absence of asset substitution risk (no CSR strengths) and the abnormal returns are insignificantly different from zero when firms engage in CSR strengths. In this case, the bondholders' and the stakeholders' interests are not aligned.

As a sensitivity analysis, we also present the regression result for a portfolio with no CSR strengths, no CSR concerns and no CSR controversies (No Strengths, No Concerns and No Controversies) in the last column of Table 3 and we find that this portfolio yields positive abnormal return ($\beta = 2.52\%$ and $p\text{-value} = 0.0011$). Thus, we find further evidence to support both H1 and H2 and conclude that bondholders' abnormal returns are higher in absence of both risks (firms' default risk and asset substitution risk).

¹⁶ The magnitudes of alphas are still economically significant even after taking into account 0.77% average bid-ask spread from Nieto's (2018) study that overlaps our sample periods (2002–2014).

Table 4 Bondholders' returns and bond maturities

Maturity	Portfolios	Alpha	Market	Duration	Default	Option	Equity	Global	Adj R ² (%)
0-1y	CSR concerns	- 0.43% *** [0.0004]	1.12*** [0.0000]	0.00 [0.7467]	0.00 [0.9902]	0.01 [0.2483]	0.00 [0.5293]	0.02 [0.1622]	96.92
0-1y	No CSR concerns	2.62% *** [0.0001]	0.27*** [0.0309]	0.00 [0.979]	0.02* [0.0981]	-0.05 [0.3919]	0.01 [0.4379]	-0.08 [0.1541]	88.18
0-1y	CSR controversies	- 0.30% *** [0.0000]	1.18*** [0.0000]	0.00 [0.6271]	0.00 [0.6303]	-0.01 [0.3922]	0.00 [0.4134]	0.02* [0.0863]	99.18
0-1y	No CSR	1.56% *** [0.0000]	0.20*** [0.0008]	0.00 [0.5803]	0.01 [0.2967]	0.00 [0.978]	0.00 [0.9514]	-0.03 [0.5035]	26.26
0-1y	Controversies	- 0.33% *** [0.0002]	1.11*** [0.0000]	0.00 [0.7812]	0.00 [0.4428]	0.01 [0.3606]	0.00 [0.5748]	0.02* [0.0572]	97.41
0-1y	CSR strengths	2.62% *** [0.0003]	0.26*** [0.0372]	0.00 [0.9834]	0.03* [0.0546]	-0.08 [0.2225]	0.01 [0.6374]	-0.08 [0.1343]	86.62
0-1y	No CSR strengths	2.63% *** [[0.0007]	0.32*** [0.0371]	0.00 [0.9407]	0.02 [0.2617]	-0.08 [0.2413]	0.02 [0.2806]	-0.08 [0.2181]	71.20
1-5y	CSR concerns	- 0.18% ** [0.0473]	0.97*** [0.0000]	0.00 [0.1986]	0.00 [0.8671]	0.01 [0.6095]	0.00 [0.8341]	-0.04 [0.4244]	98.26
1-5y	No CSR concerns	0.69% * [0.0733]	1.11*** [0.0000]	-0.02 [0.1368]	0.01 [0.6585]	-0.02 [0.6895]	0.00 [0.6827]	0.10 [0.3846]	88.12
1-5y	CSR controversies	- 0.56% * [0.0745]	1.11*** [0.0000]	0.01 [0.7205]	0.01 [0.6269]	0.07 [0.4472]	0.00 [0.7899]	-0.01 [0.9339]	88.18
1-5y	No CSR	0.14% ** [0.0476]	0.98*** [0.0000]	0.00 [0.7209]	-0.01 [0.395]	-0.01 [0.5457]	0.00 [0.8186]	0.02 [0.5172]	98.86
1-5y	Controversies	- 0.18% ** [0.0464]	1.00*** [0.0000]	0.01 [0.0376]	0.00 [0.5862]	0.02 [0.1992]	0.00 [0.9064]	0.02 [0.4438]	99.04
1-5y	CSR strengths	1.02% ** [0.0258]	1.04*** [0.0000]	-0.02* [0.0559]	0.01 [0.7488]	-0.07 [0.1708]	0.01 [0.4893]	0.02 [0.7799]	86.08

Table 4 (continued)

Maturity	Portfolios	Alpha	Market	Duration	Default	Option	Equity	Global	Adj R ² (%)
1-5y	No strengths, no concerns & no controversies	0.87% [0.0643]	1.05*** [0.0000]	-0.02 [0.2121]	0.04* [0.0829]	-0.08 [0.1703]	0.01 [0.7475]	-0.03 [0.7089]	86.54
5-10y	CSR concerns	- 0.22% ** [0.0222]	1.00*** [0.0000]	0.01 [0.1587]	0.00 [0.7377]	0.01 [0.4501]	0.00 [0.9158]	0.03 [0.2859]	99.53
5-10y	No CSR concerns	1.01% ** [0.0489]	0.96*** [0.0000]	-0.04 [0.1185]	0.01 [0.835]	-0.05 [0.5459]	0.02 [0.174]	-0.15 [0.2131]	91.69
5-10y	CSR controversies	- 0.91% *** [0.0063]	1.06*** [0.0000]	-0.02* [0.0894]	-0.03 [0.2964]	0.01 [0.9163]	0.02 [0.1179]	-0.04 [0.5589]	95.16
5-10y	No CSR	0.34% *** [0.0033]	0.99*** [0.0000]	0.00 [0.9468]	0.01 [0.3467]	-0.01 [0.491]	-0.01 [0.1723]	0.01 [0.5876]	99.39
5-10y	Controversies	- 0.19% * [0.0763]	1.00*** [0.0000]	0.01 [0.1459]	0.00 [0.8349]	0.03 [0.2885]	-0.01 [0.2266]	0.00 [0.9173]	99.49
5-10y	CSR strengths	0.99% ** [0.0216]	0.98*** [0.0000]	-0.05* [0.0367]	-0.02 [0.5611]	-0.14 [0.1142]	0.03** [0.0339]	-0.02 [0.8646]	93.30
5-10y	No CSR strengths	2.16% *** [0.0018]	0.85*** [0.0000]	-0.05 [0.1268]	0.00 [0.9926]	-0.23* [0.0177]	0.04** [0.0322]	-0.09 [0.5045]	86.78
10+y	CSR concerns	-0.09% [0.7845]	0.98*** [0.0000]	0.03 [0.1081]	0.00 [0.8357]	0.00 [0.9505]	-0.01 [0.2512]	-0.02 [0.7277]	98.32
10+y	No CSR concerns	-0.22% [0.8366]	1.03*** [0.0000]	-0.16*** [0.0096]	-0.02 [0.7101]	0.05 [0.7979]	0.01 [0.5879]	-0.21 [0.2731]	82.90
10+y	CSR controversies	-0.79% [0.1744]	0.94*** [0.0000]	0.03 [0.3798]	-0.03 [0.3087]	-0.03 [0.7591]	-0.01 [0.5205]	-0.18 [0.1308]	94.79
10+y	No CSR	0.28% [0.2050]	1.02*** [0.0000]	-0.01 [0.4011]	0.01 [0.6132]	0.01 [0.7824]	0.00 [0.3314]	0.07 [0.1772]	99.21
10+y	Controversies	-0.20% [0.4079]	1.01*** [0.0000]	0.01 [0.2504]	-0.02 [0.1811]	-0.01 [0.6886]	0.01 [0.477]	0.04 [0.2879]	99.02

Table 4 (continued)

Maturity	Portfolios	Alpha	Market	Duration	Default	Option	Equity	Global	Adj R ² (%)
10+y	No CSR strengths	- 0.14% [0.8775]	0.99*** [0.0000]	- 0.13** [0.0161]	0.00 [0.9102]	0.04 [0.8196]	0.01 [0.7558]	- 0.30** [0.0455]	87.05
10+y	No strengths, no concerns & no controversies	- 0.49% [0.6848]	1.02*** [0.0000]	- 0.15** [0.0340]	- 0.02 [0.6808]	0.03 [0.8824]	0.02 [0.3397]	- 0.28 [0.1371]	81.38

This table displays the regression results for the value-weighted aggregated portfolios broken down into different maturity ranges using the nine-factor model with US benchmarks for the sample period January 2001 to December 2014. Column one shows the bond maturity buckets. Column two shows the portfolios analysed. Column three shows the annualized alphas. Column four shows the market betas. Column five to nine presents the slope coefficients estimated by the model for Duration, Default, Option, Equity and Global. The rest of the slope coefficients are suppressed to conserve space. Negative coefficients indicate exposure to the respective opposite investment style: short-term bonds for the Duration factor; and for the other factors the conceptual opposite. The table also displays the adjusted R-square for each portfolio. The p-value is reported in parenthesis [] under the coefficient. Coefficient covariances and standard errors are corrected for heteroscedasticity and autocorrelation based on Newey and West (1987). ***, **, and * represent statistically significant at 1%, 5% and 10% levels respectively

5.2.2 Bondholders' abnormal returns and bond maturities

We examine the moderating effect of bond maturity by examining bondholders' abnormal returns across different bond maturities. We argue that bondholders with longer bond maturities are less concerned about firms' default risk and asset substitution risk since bondholders with longer maturity bonds are more concerned with the firm's ability to continuously pay coupon payments throughout the entire bond maturity. Table 4 presents the regression results for the bondholders' abnormal returns across four different maturity buckets: 0–1 year (0–1y), 1–5 year (1–5y), 5–10 year (5–10y) and more than 10 years (10+y). We find that the abnormal returns (alphas) for portfolios of bonds issued by firms with CSR concerns are negative across three different maturity buckets ($\beta = -0.43\%$ and $p\text{-value} = 0.0004$ for 0–1y; $\beta = -0.18\%$ and $p\text{-value} = 0.0473$ for 1–5y; and $\beta = -0.22\%$ and $p\text{-value} = 0.0222$ for 5–10y), except for the longest bond maturity bucket is not statistically significant ($\beta = -0.09\%$ and $p\text{-value} = 0.7845$ for 10+y). The magnitudes of the alphas (-0.18% to -0.43% per annum) are economically significant relative to the mean excess returns for firms with CSR concerns. Similarly, we find the abnormal returns (alphas) for portfolio of bonds issued by firms with CSR controversies are negative across three different maturity buckets ($\beta = -0.30\%$ and $p\text{-value} = 0.0000$ for 0–1y; $\beta = -0.56\%$ and $p\text{-value} = 0.0745$ for 1–5y; and $\beta = -0.91\%$ and $p\text{-value} = 0.0663$ for 5–10y), except for the longest bond maturities is statistically insignificant ($\beta = -0.79\%$ and $p\text{-value} = 0.1744$ for 10+y). In contrast, the alphas for bond portfolios of firms with no CSR concerns or no CSR controversies or no CSR strengths, no CSR concerns and no CSR controversies are positive and significant across three different maturity buckets (0–1y, 1–5y, and 5–10y), except for the longest bond maturity bucket (10+y) is not significant. Thus, we find evidence to support our H3a that the relationship between bondholders' abnormal returns and firms' engagements in irresponsible actions is weaker for bonds with the longest (more than 10 years) maturities. Hence, bondholders who hold bonds with more than 10 years are less concerned with the default risk from CSR concerns and controversies.

Table 4 also displays the results for firms with CSR strengths and firms with no CSR strengths and we find that portfolios of bonds issued by firms with CSR strengths have negative abnormal returns across three different maturity buckets ($\beta = -0.33\%$ and $p\text{-value} = 0.0002$ for 0–1y; $\beta = -0.18\%$ and $p\text{-value} = 0.0464$ for 1–5y; and $\beta = -0.19\%$ and $p\text{-value} = 0.0763$ for 5–10y), except for the longest bond maturities ($\beta = -0.20\%$ and $p\text{-value} = 0.4079$ for 10+y). In contrast, the abnormal returns for bond portfolios with no CSR strengths are positive across three maturity buckets ($\beta = 2.62\%$ and $p\text{-value} = 0.0003$ for 0–1y; $\beta = 1.02\%$ and $p\text{-value} = 0.0258$ for 1–5y; and $\beta = 0.99\%$ and $p\text{-value} = 0.0216$ for 5–10y), except for the longest bond maturities ($\beta = -0.14\%$ and $p\text{-value} = 0.8775$ for 10+y). Therefore, we find supporting evidence to our H3b that the relationship between bondholders' abnormal returns and firms' CSR investments (CSR strengths) is weaker for bonds with the longest maturities. Bond portfolios with no CSR strengths, no CSR concerns and no CSR controversies also have positive abnormal returns across three maturity buckets ($\beta = 2.63\%$ and $p\text{-value} = 0.0007$ for 0–1y; $\beta = 0.87\%$ and $p\text{-value} = 0.0643$ for 1–5y; and $\beta = 2.16\%$ and $p\text{-value} = 0.0018$ for 5–10y), except for the longest bond maturities ($\beta = -0.49\%$ and $p\text{-value} = 0.6848$ for 10+y). Hence, we find evidence that bondholders who hold bonds with more than 10 years maturity are less concerned with asset substitution risk from CSR strengths. Overall, we find evidence to support both H3a and H3b and indicate that bonds with longer maturity moderates the relationship between firms' CSR and bondholders' abnormal returns.

Table 5 Bondholders' returns during pre-vs-post financial crisis [Pre-financial crisis (2001 to Dec 2007)]

Portfolios	Alpha	Market	Duration	Default	Option	Equity	Global	Adj R ² (%)
CSR concerns	- 0.38% [0.2326]	1.00*** [0.0000]	0.00 [0.9220]	- 0.01 [0.3741]	0.08*** [0.0064]	- 0.01 [0.4203]	- 0.04 [0.3197]	98.84
No CSR concerns	0.74% [0.2814]	0.99*** [0.0000]	- 0.01 [0.7523]	0.03 [0.2956]	- 0.19*** [0.004]	0.02 [0.2446]	0.05 [0.5981]	95.27
CSR controversies	- 0.76% [0.2080]	1.03*** [0.0000]	0.03 [0.3414]	- 0.03* [0.0966]	0.15* [0.0610]	0.01 [0.5780]	- 0.07 [0.3758]	95.72
No CSR controversies	0.28% [0.2164]	0.98*** [0.0000]	0.00 [0.7599]	0.01 [0.1600]	- 0.05* [0.0641]	0.00 [0.5625]	0.03 [0.3488]	99.42
CSR strengths	- 0.06% [0.6854]	0.97*** [0.0000]	0.01 [0.2784]	- 0.02* [0.0974]	0.05 [0.0324]	0.00 [0.8122]	0.01 [0.8379]	99.34
No CSR strengths	0.03% [0.9321]	1.06*** [0.0000]	- 0.03 [0.2338]	0.03* [0.0675]	- 0.08* [0.0858]	0.00 [0.8797]	- 0.02 [0.6808]	97.79
No strengths, no concerns & no controversies	0.35% [0.4539]	1.09*** [0.0000]	- 0.05 [0.1015]	0.07*** [0.0071]	- 0.21*** [0.0005]	0.01 [0.2627]	- 0.01 [0.9168]	96.70

This table displays the regression results for the value-weighted additional aggregated portfolios using the nine-factor model with US benchmarks for the subsample period January 2001 to December 2007 (pre-financial crisis). Column one shows the portfolios analysed. Column two shows the annualized alphas. Column three shows the market betas. Column four to eight present the slope coefficients estimated by the model for Duration, Default, Option, Equity and Global. The rest of the slope coefficients are suppressed to conserve space. The table also displays the adjusted R-square for each portfolio at the last column. The p-value is reported in parenthesis [] under the coefficient. Coefficient covariances and standard errors are corrected for heteroscedasticity and autocorrelation based on Newey and West (1987). ***, **, and * represent statistically significant at 1%, 5% and 10% levels respectively

5.2.3 Bondholders' abnormal returns and a negative shock in the credit market

Tables 5, 6 presents the regression results for the pre-2007 financial crisis and the post-2007 financial crisis. In Table 5, we find that the bond portfolios abnormal returns (alphas) across all different measures of CSR (CSR concerns, no CSR concern, CSR controversies, no CSR controversies, CSR strengths, no CSR strengths) are all statistically insignificant ($\beta = -0.38\%$ and $p\text{-value} = 0.2326$ for CSR concerns; $\beta = 0.74\%$ and $p\text{-value} = 0.2814$ for no CSR concern; $\beta = -0.76\%$ and $p\text{-value} = 0.2080$ for CSR controversies; $\beta = 0.28\%$ and $p\text{-value} = 0.2164$ for no CSR controversies; $\beta = -0.06\%$ and $p\text{-value} = 0.6854$ for CSR strengths; and $\beta = 0.03\%$ and $p\text{-value} = 0.9321$ for no CSR strengths). We also find that the abnormal return for no strengths, no concerns and no controversies is also statistically insignificant ($\beta = 0.35\%$ and $p\text{-value} = 0.4539$).

In contrast, Table 5 that represents the post-2007 financial crisis shows that the abnormal returns (alphas) across different measures of CSR are all statistically significant. We find that the abnormal return for a portfolio of bonds issued by firms with CSR concerns after the 2007 crisis is significantly negative ($\beta = -0.20\%$ and $p\text{-value} = 0.0088$) and the abnormal return for a portfolio of bonds issued by firms with CSR controversies after the 2007 crisis is also significantly negative ($\beta = -0.83\%$ and $p\text{-value} = 0.0660$). We also find that a portfolio of bonds issued by firms with no CSR concerns after the 2007 crisis generates a positive and significant abnormal return

Table 6 Post-financial crisis (2008 to 2014)

Portfolios	Alpha	Market	Duration	Default	Option	Equity	Global	Adj R ²
CSR concerns	- 0.20%*** [0.0088]	1.00*** [0.0000]	0.01** [0.0167]	0.00 [0.6299]	0.00 [0.7258]	0.00 [0.7075]	0.01 [0.5572]	99.83%
No CSR concerns	1.12%** [0.0162]	0.99*** [0.0000]	- 0.05** [0.0200]	0.01 [0.6702]	0.07 [0.3562]	0.01 [0.5431]	- 0.05 [0.7031]	94.45%
CSR controversies	- 0.83%* [0.066]	1.10*** [0.0000]	0.03* [0.0802]	- 0.01 [0.8226]	0.12 [0.2536]	0.01 [0.7801]	0.06 [0.6023]	94.73%
No CSR contro- versies	0.25%** [0.0305]	0.97*** [0.0000]	- 0.01** [0.0133]	0.00 [0.7557]	- 0.05** [0.0745]	0.00 [0.7699]	- 0.03 [0.3486]	99.52%
CSR strengths	- 0.26%** [0.0133]	1.00*** [0.0000]	0.01** [0.0325]	0.01 [0.3316]	0.00 [0.7456]	- 0.01** [0.086]	0.00 [0.9081]	99.73%
No CSR strengths	1.54%** [0.0102]	0.99*** [0.0000]	- 0.05** [0.0180]	- 0.03 [0.3383]	0.02 [0.7813]	0.03 [0.1100]	0.02 [0.8875]	91.28%
No strengths, no concerns & no controversies	1.53%** [0.0111]	0.94*** [0.0000]	- 0.04 [0.1114]	0.00 [0.8556]	- 0.01 [0.9517]	0.03* [0.0991]	- 0.04 [0.7999]	90.49%

This table displays the regression results for the value-weighted additional aggregated portfolios using the nine-factor model with US benchmarks for the subsample period January 2008 to December 2014 (post-financial crisis). Column one shows the portfolios analysed. Column two shows the annualized alphas. Column three shows the market betas. Column four to eight present the slope coefficients estimated by the model for Duration, Default, Option, Equity and Global. The rest of the slope coefficients are suppressed to conserve space. The table also displays the adjusted R-square for each portfolio at the last column. The p-value is reported in parenthesis [] under the coefficient. Coefficient covariances and standard errors are corrected for heteroscedasticity and autocorrelation based on Newey and West (1987). ***, **, and * represent statistically significant at 1%, 5% and 10% levels respectively

($\beta = 1.12\%$ and $p\text{-value} = 0.0162$) and a portfolio of bonds issued by firms with no CSR controversies after the 2007 crisis also brings a positive abnormal return ($\beta = 0.25\%$ and $p\text{-value} = 0.0305$). Thus, we find evidence to support our H4a that the relationship between bondholders' abnormal returns and firms' engagements in irresponsible actions is stronger after an exogenous negative shock in the credit market.

We find that a portfolio of bonds issued by firms with CSR strengths after the 2007 crisis is also significantly negative ($\beta = -0.26\%$ and $p\text{-value} = 0.0133$) and a portfolio of bonds issued by firms with no CSR strengths after the 2007 crisis is significantly positive ($\beta = 1.54\%$ and $p\text{-value} = 0.0102$). Overall, we find evidence to support our H4b that the relationship between bondholders' abnormal returns firms' CSR investments is stronger after an exogenous negative shock in the credit market, which indicates that bondholders are becoming more averse to asset substitution risk after the 2007 crisis. We also find that the abnormal return for a portfolio with no strengths, no concerns and no controversies are positively and significant during the post-2007 crisis ($\beta = 1.53\%$ and $p\text{-value} = 0.0111$), supporting both H4a and H4b. Hence, we find evidence that a negative exogenous shock in credit market during the 2007 financial crisis has heightened the relationship between firms' CSR and bondholders' abnormal returns.

5.3 Robustness tests

5.3.1 Equally-weighted portfolios

The analysis in this paper so far has been conducted using value-weighted portfolios. To test if the findings stay robust in alternative portfolio construction methods, equally-weighted portfolios are constructed and analysed using Eq. 3. This equation shows that the returns of the equally-weighted portfolios are calculated as a summation of each present bond price ($P_{i1,t}$) divided by the bond price from the previous period ($P_{i1,t-1}$). The total sum is then divided by the number of bonds in the portfolio as indicated in Eq. (3). The natural logarithm is then taken to create the appropriate return.

$$R_{pt} = \ln \left[\frac{1}{N} \left(\frac{Pi1,t}{Pi1,t-1} + \frac{Pi2,t}{Pi2,t-1} + \dots + \frac{PiN,t}{PiN,t-1} \right) \right] \tag{3}$$

The untabulated results are largely in line with those results presented Tables 3, 4, 5 and 6. Overall, our findings are robust even when the portfolios are constructed and analysed using an equally-weighted method.

5.3.2 Robustness tests pre-, during- and post-financial crisis

We conduct further analyses to examine whether bondholders’ abnormal returns (alphas) are changing during three subperiods: pre-financial crisis (January 2001 to June 2007), during-financial crisis (July 2007 to March 2009) and post-financial crisis (April 2009 to December 2014). Specifically, we disaggregate the intercept (α_i) of Eq. (2) into three components, which measure the abnormal returns during the respective subperiods as shown in Eq. (4):

$$R_{pt} - R_{ft} = \alpha_i^{pre} + \alpha_i^{during} + \alpha_i^{post} + \beta_{1i} (Market_{mt} - R_{ft}) + \beta_{2i} Duration_t + \beta_{3i} Default_t + \beta_{4i} Option_t + \beta_{5i} Equity_t + \beta_{6i} Global_t + \beta_{7i} E_t + \beta_{8i} F_t + \beta_{9i} Y_t + \Sigma \beta_i Industry Dummies + \varepsilon_{it} \tag{4}$$

The results presented in Table 7 show that bondholders abnormal returns are lower during the pre-financial crisis when firms have CSR concerns and CSR controversies and vice versa, which indicates bondholders’ aversion toward the default risk from CSR concerns and CSR controversies. We also find evidence that bondholders’ abnormal return is higher during the pre-crisis when firms do not have CSR strength, CSR concerns and CSR controversies.

We find that bondholders’ abnormal returns are very significantly lower during the financial crisis for firms with CSR concerns and CSR controversies and vice versa. This implies that during the financial crisis, the bondholders are at most concerns with the imminent default risk from CSR concerns and CSR controversies. We find bondholders’ abnormal returns are lower during the post-financial crisis for firms with CSR concerns and CSR controversies and vice versa but the magnitudes of alphas are lower compared to the alpha during the financial crisis. Furthermore, we find that bondholders’ abnormal returns are higher for firms with no CSR strengths and no CSR strengths, no CSR concerns and no controversies during post-financial crisis. This indicates that bondholders are

Table 7 Robustness tests for bondholders' return pre, during, and post financial crisis

	Pre-financial crisis Jan 2001–Jun 2007		During-financial crisis Jul 2007–Mar 2009		Post-financial crisis Apr 2009–Dec 2014		Control variables	Industry Dummies	Adj. R2 (%)
	Alpha		Alpha		Alpha				
CSR	- 0.87%*** [0.0003]		- 1.31%*** [0.0008]		- 0.67%*** [0.0009]		Yes	Yes	99.61
Concerns									
No CSR	2.69%*** [0.0037]		4.80%*** [0.0023]		2.95%*** [0.0009]		Yes	Yes	95.80
Concerns									
CSR	- 3.02%*** [0.0162]		- 2.99%* [0.0949]		- 2.16%*** [0.0458]		Yes	Yes	96.21
Controversies									
No CSR	0.98%*** [0.0035]		1.07%*** [0.0239]		0.81%*** [0.0091]		Yes	Yes	99.58
Concerns									
CSR	- 0.12% [0.6150]		- 0.02% [0.9716]		- 0.07% [0.8119]		Yes	Yes	99.54
Strengths									
No CSR	1.36% [0.1826]		1.87% [0.3079]		2.31%* [0.0611]		Yes	Yes	94.48
Strengths									
No strengths, &	2.34%* [0.0807]		3.78% [0.1254]		2.55%* [0.0669]		Yes	Yes	93.77
No concerns & No controversies									

This table displays the regression results for the value-weighted additional aggregated portfolios using the nine-factor model with US benchmarks with three dummy variables (pre, during and post financial crisis) and no intercept for the entire sample period January 2001 to December 2014. Column one shows the portfolios analysed. Column two shows the annualized alphas for pre-financial crisis (January 2001 to June 2007). Column three shows the annualized alphas for during-financial crisis (July 2007 to March 2009). Column four presents the annualized alphas for post-financial crisis (April 2009 to December 2014). The slope coefficients for Market, Duration, Default, Option, Equity, Global and nine difference ICB industries dummy variables are suppressed to conserve space. The table also displays the adjusted R-square for each portfolio at the last column. The p-value is reported in parenthesis [] under the coefficient. Coefficient covariances and standard errors are corrected for heteroscedasticity and autocorrelation based on Newey and West (1987). ***, **, * and * represent statistically significant at 1%, 5% and 10% levels respectively

becoming more concerns about the asset substitution risk during the post-financial crisis. The results during post-financial crisis are also consistent with our baseline results reported in Table 3. Overall, we find further evidence that the bondholders' aversion toward risk is affected with the exogenous shock from the global financial crisis. Therefore, the alignment and misalignment between bondholders' and stakeholders' interests are affected by the shock in the credit market.

6 Conclusions

Literature on the financial performance effects of CSR focus primarily on the relationship between firms' corporate social responsibility (CSR) performance and equity (stock) portfolio returns (Derwall et al. 2005; Kempf and Osthoff 2007; Statman and Glushkov 2009). Since bondholders are generally more concerned about the firm's risk than the shareholders and the fact that CSR influences firms' risk exposures, a greater understanding of the value relevance of CSR performance from the bondholders' perspective is important, especially since corporations have raised more capital through bond financing over equity financing during the last decade at a ratio of more than ten to one.¹⁷

Our study extends the literature in several way. First, we argue that bondholders as one important stakeholders who hold the fixed claims with the ex-ante fixed (i.e., pre-agreed) claims on firms' economic profits are concerned with firms' risks. Therefore, the value relevance of CSR contexts, i.e., CSR concerns, CSR controversies and CSR strengths, depend on how bondholders' perceive CSR contexts in relation with the default risk and asset substitution risk. Second, we pose the seemingly overlooked research question: in which CSR contexts are bondholders' interests, measured by bondholders' abnormal returns, and stakeholders' interests aligned? Likewise, we ask: in which CSR contexts do their interests diverge? Third, we also examine the moderating effect of bond maturity and the impact of exogenous negative shock in credit market on the alignment and misalignment between bondholders' interests and the stakeholders' interests. To the best of our knowledge, this is the first study that empirically examines the direct relationship between the bond secondary market returns and CSR performance (i.e., without approximating the relationship via SRI bond funds) in the US context. The secondary market bond trading data allows us to test a number of bond portfolio strategies and scenarios without the confounding effects of the fund managers' skills, mutual fund expense ratios and funds' SRI screening criteria (Borgers et al. 2015; El Ghouli and Karoui 2017; Schroeder 2007).

Our study also brings important understanding that the value relevance of CSR performance for bondholders as the fixed claimants is different from those residual claimants such as the shareholders (Derwall et al. 2005; Kempf and Osthoff 2007; Statman and Glushkov 2009). Since bonds are assessed on the bondholders' perceptions of risk, bondholders' interests are aligned with stakeholders' interests when they both are facing greater default risk from firms' socially irresponsible actions. However, their interests are not aligned when bondholders are facing greater asset-substitution risk from CSR strengths that creates an opportunity for non-bondholders stakeholders to extract greater residual profits while shifting greater risks to the bondholders.

¹⁷ See <https://www.sifma.org/resources/research/fact-book/>.

Our study has some limitations. First, our study does not examine the varying impacts of bonds' characteristics beyond the maturities such as convertibility, callability, putability, and exchangeability on the alignment and misalignment with the stakeholders' interests due to the complexity of gathering such data in a structured format from standard databases. Second, due to data limitations, our study is unable to unpack the bonds' abnormal returns across different tranches and seniorities, especially for financial firms. A future study can also analyse the mezzanine bondholders' returns of subordinate debt and firms' CSR, which we expect somewhat more like shareholders. Third, future study could examine the relationship between bond returns from the credit default swaps (CDS) market and CSR. Fourth, future study could explore the impact of interim trading and transaction costs related with rebalancing the bond portfolio on the relationship between bond abnormal returns and firms' CSR.

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