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Media-based Climate Risks and International Corporate Bond Market

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Abstract

We examine the impact of the media-based climate risks, grouped into physical and transition risk categories, on the international corporate bond market in the period from 2012 to 2022. We analyze the following aspects: (i) market development (developed versus emerging markets); (ii) credit quality (investment grade versus high yield bonds), (iii) industry (climate-sensitive versus non-sensitive industries), and (iv) maturity (short versus long term bonds). We find that transition risk is reflected in the global corporate bond market, but not in the emerging corporate bond market segment. Furthermore, transition risk has a material impact only on the investment grade bonds in the global corporate bond market. The industry analysis reveals that there are no consistent significant differences between climate-sensitive and climate-insensitive industries. Maturity analysis indicates that transition risk is reflected in global corporate bond market returns for both short and long terms, but this effect is less pronounced in emerging markets. Physical risk is not systematically reflected in international corporate bond returns. The subsample analysis shows higher importance of transition climate risk following the Paris Agreement in December 2015.

JEL classification: G10, G15

Keywords: Climate risk, Corporate bonds, Debt, Emerging markets, Physical risk, Transition risk

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** The views expressed in this paper are not necessarily shared by Robeco.

1. Introduction

Our study provides new evidence on the impact of the climate risks on the international corporate bond market. Motivation comes from the fact that climate change and climate risk are recognized as significant and complex challenges for economies, financial stability, and global financial markets (Dietz et al., 2016; Battiston et al., 2017; Giglio et al., 2021; Reinders et al., 2023). The global importance of climate change agenda has recently generated extensive literature on climate finance examining the effects of climate risk on investments (Krueger et al., 2020; Agoraki et al., 2024), firm performance (Pankratz et al., 2023), equity markets (Bolton and Kacperczyk, 2021; Giese et al., 2021; Bolton and Kacperczyk, 2023; Faccini et al., 2023), real estate markets (Baldauf et al., 2020; Murfin and Spiegel, 2020; Giglio et al., 2021), CDS markets (Kölbel et al., 2024), municipal bond markets (Goldsmith-Pinkham et al., 2019; Painter, 2020), and corporate bond markets (Huynh and Xia, 2021; Duan et al., 2023).¹ Our study builds upon this literature and examines relationship between media-based climate change risks and the international corporate bond markets in the contexts of market development (developed versus emerging markets), credit quality (investment grade versus high yield bonds), industry (climate-sensitive versus non-sensitive industries), and maturity (short versus long term bonds).²

The sustainability movement driven by environmental concerns that started in developed markets several decades ago is now profoundly affecting emerging markets. However, emerging markets encounter considerable challenges, consistently trailing behind their developed market counterparts in all sustainability metrics (Tansan et al., 2023). This disparity, especially in

¹ For a comprehensive review of the literature on climate finance, see Giglio et al. (2021) and Hong et al. (2020), and for a broader discussion on the economic consequences of the climate change, see Barnett et al. (2019).

² A theoretical foundation of the relationship between climate-related risks and bond pricing is still open question as indicated by Agliardi and Agliardi (2021) who develop a structural model for defaultable bonds incorporating uncertainty about corporate earnings and uncertainty originating from climate-related risks. For further theoretical considerations about the cost of climate change and bond markets, see Bauer and Rudebusch (2023).

environmental performance is anticipated, as firms in developed markets benefited from an early start, having implemented sustainability initiatives several decades ago in response to escalating demands from regulators, investors, and the broader society.³ Conversely, emerging markets have predominantly prioritized economic growth over environmental sustainability, resulting in less advanced regulatory frameworks and limited governmental support for environmental initiatives. Simultaneously, it is important to recognize that bonds from emerging markets present compelling investment opportunities. Despite representing an attractive investment opportunity, emerging market bonds are associated with higher level of risk and they are usually labeled as “equity-like” assets (Panchenko and Wu, 2009; Piljak, 2013; Dimic et al., 2021). Considering this distinctive feature of emerging market bonds, analyzing the connection between emerging markets corporate bonds and climate change risks holds considerable significance for investment strategies. Bond investors generally demonstrate responsiveness to potential extreme climate risks, prompting potential adjustments in their portfolio strategies. As investor sentiment increases, their heightened awareness of extreme climate risks leads to an increased demand for higher yields as means to hedge against these risks (Ye et al., 2023).

The literature provides evidence that environmental performance and climate resilience could be also influenced by industry type. For instance, the petroleum and natural gas industry ranks low in environmental performance, whereas the computer software industry is among the top performers in this domain (Di Giuli and Kostovetsky, 2014). Furthermore, the effect of climate risks on financial markets might be different across different industries (Graff Zivin and Neidell, 2014; Faccini et al., 2023; Ye et al., 2023). Ye et al. (2023) use a sample of Chinese corporate bonds and find that extreme climate risks are positively associated with firms’ offering yield spreads, with the effect more

³ During United Nations Framework Convention on Climate Change 2023 (COP27), developed-market governments recognized this imbalance by creating a “loss and damage fund” to help emerging market nations become more resilient in the face of climate change. For more information see: <https://www.un.org/en/climatechange/cop27>

emphasized for companies in climate-sensitive industries. Hence, it is important to determine whether the effect of climate risks on corporate bond returns depends on the magnitude of the industry-sensitivity to climate change.

In addition to industry-based differences, the literature indicates that the effect of climate risks on bond markets might differ across different time horizons. In particular, Ye et al. (2023) find that extreme climate risks are positively associated with firms' offering yield spreads, with the effect being more pronounced for long-maturity corporate bonds. Bats et al. (2024) analyze euro area European corporate bond markets and find that for bonds with long maturities there is a significant pricing effect of physical risk.

Early studies on the effects of climate risks on financial markets use physical risk such as the sea-level rise (Goldsmith-Pinkham et al., 2019; Allman 2022) and carbon emission (Duan et al., 2023) to proxy for climate change risk. Given the multifaceted nature of climate risk, more recent studies make distinction between physical and transition risks and examine their effects separately.⁴ For instance, Stroebel and Wurgler (2021) emphasize importance of distinguishing between physical and transition risks, as they have different relative importance in short and long run. In particular, the transition (regulatory) risk is the top climate risk for investors and businesses over the time horizon of the next five years, while physical risk will be the top risk over the next 30 years. Seltzer et al. (2022) focus on regulatory risks and examine its effects on corporate bond credit ratings and yield spreads.

The need to distinguish between physical and transition risks has led to developments of new measures of climate risk. One stream of the literature has focused on firm-level climate risk measures based on a textual analysis of earnings conference call transcripts (Sautner et al., 2023; Li et al.,

⁴ Giglio et al. (2021) provide a comprehensive discussion of multifaceted nature of climate risk and its implications for asset pricing.

2024). Sautner et al. (2023) utilize machine learning method to measure firm's climate change exposures to physical and regulatory shocks related to climate change. Similarly, Li et al. (2024) use textual analysis to quantify the presence and materiality of firm's exposure to both physical and transition climate risks. The other stream of literature evolves around media-based climate risk measurement (Engle et al., 2020; Kapfhammer et al., 2020; Faccini et al., 2023; Ardia et al., 2023; Bessec and Fouquau, 2024; Liu et al., 2024; Bua et al., 2024).

Engle et al. (2020) made a pioneering contribution by proposing two monthly indices to measure climate change risk using news articles. The first index relates to attention about climate change news from the Wall Street Journal (WSJ) and employs a lexicon known as the Climate Change Vocabulary (CCV), which is derived from authoritative texts on climate change (Engle et al., 2020). The second index focuses on Hexagon sentiment-based measure to capture the negative attention to climate change in several newspapers. Faccini et al. (2023) utilize textual and narrative analysis of Reuters climate change news to develop risk factors associated with physical (natural disasters and global warming) and transition (international summits, and U.S. climate policy) risks. They find that only the U.S. climate policy factor is priced in US stocks, particularly after year 2012. Furthermore, Kapfhammer et al. (2020) employ country-specific climate change transition risk measures to show that commodity currencies undergo depreciation during periods of elevated climate change transition risk.

Ardia et al. (2023) introduce daily time series designed to capture media concerns regarding climate change. To measure climate change risks, Ardia et al. (2023) utilize a daily Media Climate Change Concerns Index (MCCC) based on climate change news from leading U.S. newspapers and newswires. In times of sudden surge in climate change concerns, the stock prices of green companies typically rise, while those of brown companies tend to decline with this effect being evident for both transition and physical climate change risks (Ardia et al., 2023). Bua et al. (2024) create two new

daily indicators to measure physical and transition risks from 2005 to 2021, alongside two global climate risk vocabularies.

By applying these indices to evaluate asset pricing, Bua et al. (2024) observe the emergence of significant transition and physical risks premiums after Paris Agreement (post-2015 period), which is aligned with Bolton and Kacperczyk (2003) who pointed out that the Paris Agreement changed investors' awareness about the urgency of climate change. Bessec and Fouquau (2024) develop several measures of attention, tonality and uncertainty about environmental news in major US newspapers. Liu et al. (2024) construct climate change news index for Chinese market by using textual analysis of newspapers in China.

In our study, climate change risks are proxied by the Media Climate Change Concern (MCCC) Index developed by Ardia et al. (2023).⁵ The MCCC Index is based on the news about climate change published by ten major highly circulated US newspapers and two major newswires, and further divided into four clusters capturing transition and physical risk themes. In particular, there are four clusters: (i) Business Impact; (ii) Environmental Impact; (iii) Societal Debate; and (iv) Research. The Business Impact and Societal Debate are proxies for the transition risks, Environmental Impact is proxy for physical risk, while Research cluster is formed by topics related to both transition and physical risks.

Our paper contributes to the literature in several ways. We extend the literature on the corporate bond markets⁶ by examining how media-based climate change risks affect international corporate bond markets. In particular, we provide a comprehensive analysis in several different contexts: (i) market development context, considering both developed and emerging corporate bond

⁵ The MCCC Index has been used by Pástor et al. (2022), Alekseev et al. (2022), Campos-Martins and Hendry (2021), among others.

⁶ The literature on the factors influencing the corporate bond market returns is extensive. The most prominent studies include Fama and French (1993), Bao et al. (2011), Dick-Nielsen et al. (2012), Lin et al. (2018), Bekaert and De Santis (2021), Huang and Shi (2021), among others.

markets, (ii) credit quality (investment grade versus high yield bonds), (iii) industry (climate-sensitive versus non-sensitive industries), and (iv) maturity (short versus long term bonds). Previous literature on the effects of climate change on bond markets focuses on US corporate bond market (Huynh and Xia, 2021; Allman, 2022; Duan et al., 2023) and US municipal bonds (Goldsmith-Pinkham et al., 2019; Painter, 2020) primarily focusing on physical climate risk. Duan et al. (2023) use carbon emissions data to proxy for climate risk, Allman (2022) uses sea-level rise, while Huynh and Xia (2021) examine transition risk by utilizing monthly climate change news index by Engle et al. (2020). We complement this literature by providing new comprehensive evidence from emerging corporate bond markets while focusing on both physical and transition climate risks proxied by daily media-based climate change risks by Ardia et al. (2023).

We also extend the studies examining industry, maturity and credit quality aspects of the climate change impact on corporate bond markets (Mastouri et al., 2022; Ye et al., 2023). Mastouri et al. (2022) focus on credit spreads and utilize corporate bond portfolios from developed markets including investment grade and high yield credit segments and different corporate sectors. They use greenhouse gas emission intensity and global temperature-rise scenario as proxies for the physical climate risk. Ye et al. (2023) examine the relationship between extreme climate risks (measured by extreme weather events) and offering yield spreads of Chinese corporate bonds and for the subsamples of climate-sensitive and climate-insensitive industries. Our paper differs from Mastouri et al. (2022) and Ye et al. (2023) by analyzing corporate bond returns in both developed and emerging markets with comprehensive analysis of credit quality, industry and maturity aspects, and by focusing on media-based climate change risks as proxies for both physical and transition climate risks.

The remainder of the paper is organized as follows. Section 2 describes our data and methodological framework. In Section 3, we discuss our empirical results. Finally, Section 4 concludes.

2. Data and methodology

2.1 Data on climate change

To proxy the climate change risks we utilize the Media Climate Change Concern (MCCC) Index developed by Ardia et al. (2023). The MCCC Index is based on the news about climate change published by ten major highly circulated US newspapers and two major newswires.⁷ The MCCC Index is further divided into four clusters capturing transition and physical risk themes. In particular, there are four clusters: (i) Business Impact, (ii) Environmental Impact, (iii) Societal Debate, and (iv) Research. The Business Impact and Societal Debate are proxies for the transition risks, Environmental Impact is proxy for physical risk, while Research cluster is formed by topics related to both transition and physical risks.

The Business Impact cluster is build up from the following topics: climate summits, agreements/actions, climate legislation/regulations, legal actions, renewable energy, carbon reduction technologies, carbon credits market, carbon tax, government programs, corporations/investments, car industry, and airline industry. The Environmental Impact cluster consists of the following topics: extreme temperatures, food shortage/poverty, hurricanes/floods, glaciers/ice sheets, ecosystems, forests, water/drought, tourism, arctic wildlife, marine wildlife, and agriculture shifts. The Societal Debate consists of four topics: political campaign, social events,

⁷ For the detailed list of the newspapers and newswires please refer to Ardia et al. (2023).

controversies, and cities. Finally, the Research cluster is build up from three topics: global warming, UN/IPCC reports, and scientific studies.

2.2 Data on corporate bond markets

Dataset includes comprehensive universe of corporate bonds worldwide (including developed and emerging markets), represented by the suite of the J.P. Morgan corporate bond indices. The J.P. Morgan Global Corporate Index (GCI) suite of indices tracks corporate bonds across developed and emerging markets.⁸ The J.P. Morgan Global Corporate Index (GCI) is a composite benchmark that integrates the Investment Grade and High Yield corporate debt markets, in both the developed and emerging markets. We use the GCI Aggregate Index that includes corporate debt denominated in USD. The GCI Aggregate Index is divided into the GCI Investment Grade and the GCI High Yield segments, and further divided into different maturity buckets. We use 1-3 years bucket to represent short term, 7-10 years bucket to represent medium term, and 20-30 years bucket to represent long term maturities.

We also use the GCI industry sub-indices derived by adopting a harmonized industry classification methodology. There are 14 different industries sub-indices: Automotive, Banks, Basic Industries, Cable/Media, Capital Goods, Consumer, Energy, Non-Bank Financials, Pharma/Healthcare, Real Estate, Technology, Telecom, Transportation, and Utilities. We divide industries into climate-sensitive and climate-insensitive by relying on the methodology applied by the Morgan Stanley to identify industries that are most likely to be affected by shifting policies

⁸ The GCI Index includes instrument types: fixed rate, floating rate, step-up, PIK, toggle, amortizers, perpetuals, Sukuk, Tier 2, non-contingent convertible T1 capital, non-registered securities, and all subordinated financial bonds except AT1 or RT1. Only issues with a current face amount outstanding of US\$250 million or more are considered for inclusion.

surrounding climate change.⁹ In particular, climate-sensitive industries in our sample are: Automotive, Banks, Non-Banks Financials, Energy, Transportation, and Utilities.

Emerging markets corporate bonds are represented by the Corporate Emerging Market Bond Index (CEMBI) Broad Diversified Index, which is a global, liquid corporate emerging markets benchmark that tracks USD denominated corporate bonds issued by emerging markets entities.¹⁰ In a similar manner like for the GCI, we use the CEMBI Investment Grade and the CEMBI High Yield segments, further divided into maturity buckets representing short (1-3 years), medium (7-10 years), and long (10+ years) maturities. The CEMBI industry sub-indices represent the same 14 industries like for the GCI.

We use daily data on total return indices, meaning that they incorporate both bond price changes and coupon payments. The bond returns are calculated as the logarithmic first difference of the bond price indices.¹¹ The sample period spans from 31 December, 2012 to 31 August, 2022 and includes 2416 daily observations. The starting date of the sample period is determined by the date when JP Morgan launched the GCI Index, while the ending date of the sample is determined by the availability of climate change news data provided by Ardia et al. (2023).

Our empirical estimations include a set of the following control variables:

⁹ Morgan Stanley is using tools such as the Sustainability Accounting Standard Board's materiality matrix and the PRI-backed Inevitable in identifying industries that are most likely to be affected by shifting policies surrounding climate change. They identify five industries that have higher sensitivity to climate change: Financial Services, Metals and Mining, Oil and Gas, Utilities, and Autos. The names of some industries in our sample slightly differ from the exact names in the industry classification of Morgan Stanley, but the essence of the covered industries is the same despite slightly different names.

https://www.morganstanley.com/im/publication/insights/articles/articles_fivesectorsthatcannotescapeclimatechange_us.pdf

¹⁰ CEMBI Broad Diversified Index includes both fixed and floating rate securities along with capitalizing/amortizing bonds or loans (excludes convertibles, inflation-linked instruments, and defaulted bonds). Only issues with a current face amount outstanding of US\$300 million or more are considered for inclusion. The index includes a specific set of emerging markets countries in Asia ex-Japan/Australia/New Zealand, Eastern Europe, the Middle East, Africa and Latin America.

¹¹ This measurement has also been used by Kim et al. (2006), Christiansen (2007), Piljak and Swinkels (2017), Dimic et al. (2021).

i) Term spread: We control for interest rate risk proxied with the term spread, computed as the difference between the long-term government bond return and the three-months Treasury bill return (see, e.g. Huynh and Xia, 2021).

iii) Default spread: The default spread is the difference between Moody's seasoned Baa corporate bond yield relative to the 10-year Treasury bond yield, capturing shifts in economic conditions that change the likelihood of default (see, e.g. Bhanot, 2005; Huynh and Xia, 2021).

iii) Global liquidity conditions: Our proxy for the global liquidity conditions is the U.S. federal funds rate. Data are from the Federal Reserve System database. We use the daily data of the U.S. federal funds rate as an indicator of the tightening (loosening) of global liquidity conditions (see, e.g., Schularick and Taylor, 2012; Boubaker et al., 2019).

iv) Global bond market volatility: The literature provides evidence that uncertainty of the global bond market, as measured by implied volatility, might influence bond markets returns (Piljak, 2013). As a proxy for the bond market volatility, we utilize the daily rate of change in the Merrill Lynch Option Volatility Estimate (MOVE) Index (see, e.g. Zhou, 2014; Dimic et al., 2016). The MOVE index is calculated as the yield curve weighted index of the normalized implied volatility on 1-month Treasury options weighted on two-, five-, ten-, and thirty-year contracts.

v) Global bond market returns: Our benchmark for the global bond market is the J.P. Morgan Global Aggregate Bond Index (GABI), constructed by combining 5,500 instruments issued in more than 60 countries, denominated in over 25 currencies, collectively representing a total market value about USD 58 trillion (see, e.g., Dimic et al., 2021).

2.3 Descriptive statistics

Insert Table 1 here

Table 1 displays descriptive statistics. Panel A shows basic statistics (mean, standard deviation, minimum and maximum values) for daily index returns for J.P. Morgan Global Corporate Index (GCI) on aggregate level, further divided into high yield and investment grade segments. Panel B presents daily returns for 14 industry components of the GCI, while Panel C reports daily returns across various maturities. Panel D displays the basic statistics for daily returns of J.P. Morgan CEMBI Broad Diversified Index, representing aggregate emerging corporate bond market, and further divided into high yield and investment grade segments. Panel E and F show daily returns for industry and maturity components of J.P. Morgan CEMBI Broad Diversified Index, respectively. Panel G shows summary statistics of media-based climate change risks developed by Ardia et al. (2022) and divided into four clusters: Business Impact, Environmental Impact, Societal Debate, and Research. Finally, Panel H displays descriptive statistics for control variables.

The statistics indicate that emerging corporate bond markets (CEMBI) have slightly higher average daily returns than the aggregate corporate bond market consisting of developed and emerging markets together (GCI). The daily returns slightly differ across industries, with the highest returns are recorded for Non-bank Financial industry for GCI universe, and Cable/Media industry for emerging markets universe. The correlation matrix of the main variables included in the empirical analysis is provided in the Appendix.

2.4 Methodology

Methodological framework is similar to Baur and Smales (2020). More specifically, we apply regression analysis with different specifications to investigate the impact of the climate change risks on the corporate bond returns, while paying attention to the aspects of market development, credit quality, climate-sensitive industries, and maturity. We run two separate sets of regressions: (i) set of

the regressions for the global corporate bond market, and (ii) set of the regressions for the emerging corporate bond market.

The baseline regression specification for the aggregate corporate bond returns is expressed by the following equation:

$$R_{aggregate;IG;HY,t} = \beta_0 + \beta_1(BI_t) + \beta_2(EI_t) + \beta_3(SD_t) + \beta_4(R_t) + \beta_5C_t + \varepsilon_t \quad (1)$$

where $R_{aggregate,t}$ denotes the daily log return of the corporate bond index on the aggregate level, $R_{IG,t}$ daily log return for investment grade (*IG*) and $R_{HY,t}$ daily log return for high yield (*HY*) categories, respectively. The regressions are estimated on the aggregate level separately for global and emerging corporate bond markets. The key explanatory variables are four clusters of the Media Climate Change Concerns (MCCC) Index: Business Impact (*BI*), Environmental Impact (*EI*), Societal Debate (*SD*), and Research (*R*). C_t represents a set of control variables (term spread, default spread, global liquidity conditions, and global bond market volatility, and global bond market returns)¹².

The industry-related analysis is estimated by the following regression specification:

$$R_{industry,t} = \beta_0 + \beta_1(BI_t) + \beta_2(EI_t) + \beta_3(SD_t) + \beta_4(R_t) + \beta_5C_t + \varepsilon_t \quad (2)$$

where $R_{industry,t}$ denotes the daily log returns of the 14 different industry-specific corporate bond indices; *BI*, *EI*, *SD*, and *R* denote four clusters of the Media Climate Change Concerns (MCCC)

¹² We use the global bond market returns as a control variable only in the specifications where the emerging bond market indexes (CEMBI) are dependent variable in order to control for the global bond market factor.

Index. C_t represents a set of control variables (term spread, default spread, global liquidity conditions, and global bond market volatility, and global bond market returns). The regressions are estimated on the industry level separately for global and emerging corporate bond markets.

The maturity-related analysis is estimated by the following regression specification:

$$R_{maturity,t} = \beta_0 + \beta_1(BI_t) + \beta_2(EI_t) + \beta_3(SD_t) + \beta_4(R_t) + \beta_5C_t + \varepsilon_t \quad (3)$$

where $R_{maturity,t}$ denotes the daily log returns of the maturity-specific corporate bond indices; BI , EI , SD , and R denote four clusters of the Media Climate Change Concerns (MCCC) Index. C_t represents a set of control variables (term spread, default spread, global liquidity conditions, global bond market volatility, and global bond market returns). The regressions are estimated for different maturities separately for global and emerging corporate bond markets.

The estimation results are reported for different model specifications for global and emerging corporate bond markets, as follows. In particular, Table 2 reports estimation results from Equation (1) where the GCI Aggregate, GCI Investment Grade, and GCI High Yield are dependent variables, respectively. Table 3 shows the results for the specifications in Equation (2) where the GCI Aggregate is divided into 14 industries. Table 4 is based on the specification in Equation (3) and displays the results of the maturity aspect, where the GCI Investment Grade and GCI High Yield are further divided into three subindices representing short (1-3 years), medium (7-10 years) and long (20-30 years) maturity.

Table 5 reports the results from Equation (1) but only for the emerging corporate bond markets segment on the aggregate level (CEMBI Aggregate) and divided into investment grade (CEMBI Investment Grade) and high yield (CEMBI High Yield) categories. Table 6 shows the results from Equation (2) for different industries of the emerging corporate bond markets. Finally, Table 7

displays the results for the emerging markets segment based on the maturity aspect presented in Equation (3), where the CEMBI Investment Grade and CEMBI High Yield are further divided into three subindexes representing short (1-3 years), medium (7-10 years) and long (10+ years) maturity.

3. Empirical results

In this section, we report empirical results on the impact of climate change risks on international corporate bond markets. In order to facilitate the interpretation of results from the market development perspective, in the subsection 3.1 we present the results for the global corporate bond market (including both developed and emerging bond markets) and in the subsection 3.2 separately for emerging corporate bond market segment. Similarly, to provide further insights from the credit quality, industry, and maturity aspects, we further report the results for the investment grade and high yield categories, and across different industries and maturities (short, medium, and long).

3.1 Global corporate bond market analysis

In Table 2 we report the impact of climate change risks on the global corporate bond market. The first column indicates the results on the aggregate index level (GCI Aggregate), while the second and third columns display the results for the investment grade (GCI IG) and high yield (GCI HY) categories, respectively. The results for the global market indicate that only transition risk (represented by Societal Debate and Business Impact clusters) shows statistically significant relationship, while physical risk is insignificant. In particular, the coefficient for the cluster Societal Debate is negative and statistically significant at 5% level, indicating that increasing risks related to this cluster (composed of the following topics: political campaign, social events, controversies, and cities) have a negative effect on the corporate bond market returns. The Business Impact cluster

shows positive coefficient with statistical significance at 10% level, indicating that risks related to this cluster (including topics such as climate summits, agreements/actions, climate regulation, legal actions, and government programs, among others) have a slightly positive effect on the corporate bond market returns as they might reflect positive expectations for the future stemming from new regulations and international agreements that should support efforts to combat the climate change. Similar results in terms of statistical significance and the signs of coefficients are exhibited for the investment grade category of the global corporate bond market, while on contrary the high yield segment does not show statistical significance for any of four clusters of climate change risks (although the coefficient signs are the same).

Physical risk, captured by Environmental Impact cluster (including topics such as extreme temperatures, hurricanes/floods, glaciers, water/draught, agriculture shifts, among others) is not systematically reflected in global corporate bond markets returns. The general finding of the importance of only transition risk (and not physical risk) is aligned with the literature on the impact of climate change on equity markets (Faccini et al. 2023).

Insert Table 2 here

3.1.1 Industry analysis (climate-sensitive and non-sensitive industries)

Table 3 displays the analysis of the global corporate bond market divided further into 14 different industries. The aim of industry analysis is to reveal which industries are more affected by transition or physical risks and to identify whether climate-sensitive industries are more affected by the media-based climate change risks than climate-insensitive industries. Overall, the results across industries indicate importance of transition risk relative to physical risk. The most prominent cluster is Societal Debate with a significant impact in almost all industries, with the

exception of Real Estate and Transportation. The sign of the coefficient is negative and consistent across all industries, confirming the general finding of the negative effect of climate risks at the aggregate global corporate bond market level.

The other component of transition risk, represented by Business Impact cluster, shows significance in ten out of 14 industries. Two industries where Business Impact cluster is not relevant are the same as in the case of Societal Debate cluster (Real Estate and Transportation), while two other unaffected industries are Basic Industries and Energy. Research cluster, which is related to both transition and physical risks, is significant only in 3 industries: Consumer, Real Estate, and Technology. However, the presented results do not reveal consistent significant differences between climate-sensitive (e.g. Automotive, Energy, Transportation, and Utilities) and climate-insensitive industries in terms of the exposure of their bond returns to media-based climate change risks. This finding complement findings of Mastouri et al. (2022) who show that industries with higher climate-policy risk (utilities, energy, and materials) do not have significantly wider credit spreads than other industries with lower climate risk.

Insert Table 3 here

3.1.2 Maturity analysis

In Table 4 we display the results of the global corporate bond market divided further into segments based on the maturity aspect. Specifically, in the short term (maturities from 1-3 years) the only statistically significant cluster is Societal Debate (the coefficient is negative and significant on 10% level) and only for the investment grade category. This result is in line with Stroebel and Wurgler (2021) who find that transition risk is the top climate risk in the short run (over the next five years). In the medium term (maturities from 7-10 years) the coefficient for

Societal Debate is negative and statistically significant for both investment grade and high yield categories. In addition to Societal Impact, for the investment grade category there is also significance of Business Impact and Research clusters at 10% level.

The results for the long term (maturities from 20-30 years) show again that only transition risk is relevant. In particular, Business Impact cluster exhibits positive sign and it is significant for the investment grade category, while for the high yield category the relevant cluster is Societal Debate (negative and significant at 5% level). The insignificance of physical risk is in general in contrast to Bats et al. (2024) who analyze euro area European corporate bond markets and find that for bonds with long maturities there is a significant pricing effect of physical risk. However, Bats et al. (2024) argue that the pricing of climate risk premiums in Europe may differ from the rest of the world due to European Union's prominent role in climate regulations initiatives and their commitment to a net-zero emissions. Furthermore, they use different measure of physical risk news shocks based on Bua et al. (2024), and they focus on cross-sectional analysis of bonds only from the euro area. Our results might provide support for their argumentation that the pricing of climate risk premiums in Europe may differ from the rest of the world.

Insert Table 4 here

3.2 Emerging corporate bond market analysis

The previous section showed that only transition risk (and not physical risk) is reflected to the certain extent in the global corporate bond market. In this section, we focus further on the emerging corporate bond market and report the results in Table 5. In a similar fashion as in Table 2, the first column indicates the results on the aggregate index level (CEMBI Aggregate), while

the second and third columns display the results for the investment grade (CEMBI IG) and high yield (CEMBI HY) categories, respectively.

The results across all specifications show that neither of clusters of climate change risks is statistically significant. This finding shows that climate change risks are not reflected in the corporate bond returns in emerging markets, indicating that emerging markets are still lagging behind developed markets in acknowledging importance of climate change agenda. This finding reflects the actions at COP27 where governments of developed markets created a “loss and damage fund” to support emerging market nations to become more resilient to challenges posed by climate change.¹³

Insert Table 5 here

3.2.1 Industry analysis (climate-sensitive and non-sensitive industries)

Table 6 displays the results for the emerging corporate bond market divided further into 14 different industries. The results reveal that in general, the industry returns of emerging corporate bond market are not affected by media-based climate risks, with the only exception of Automotive and Non-Bank Financial industries in the case of Societal Debate cluster (negative sign) and Utilities in the case of Research cluster (negative sign). This result is generally in contrast to Ye at al. (2023) who show that climate-sensitive industries exhibit more pronounced effect of extreme climate risk on firms’ offering yield spread. Ye at al. (2023) use only Chinese corporate bonds

¹³ For more detailed discussion about the sustainability gap in emerging markets and its importance, see the World Economic Forum (<https://www.weforum.org/agenda/2023/03/how-to-fill-the-sustainability-gap-in-emerging-markets-and-why-it-matters/>)

and their results of significant difference between climate-sensitive and climate-insensitive industries might be driven by country-specific landscape and their focus on physical risk only.

Insert Table 6 here

3.2.2 Maturity analysis

Table 7 displays the results of the emerging corporate bond market divided further into segments based on the maturity aspect. In a similar manner to Table 4, we analyze short (1-3 years), medium (7-10 years) and long (10+ years) maturities.¹⁴

Insert Table 7 here

The results presented in Table 7 show that for investment grade category the only significant cluster in the short term is Research, with the negative coefficient significant at 5% level, while Societal Debate is the only cluster relevant in the long term with the negative coefficient significant at 10% level. However, for the high yield category, neither of clusters is statistically significant. Overall results for the emerging corporate bond markets indicate that the media-based climate risks are not reflected in this market segment at the aggregate level, with the only notable exceptions of Research cluster in short term and Societal Debate cluster in the long term in investment grade category.

¹⁴ The long maturity horizon definition differs slightly between the aggregate (GCI) and emerging (CEMBI) corporate bond market, where the long term for the GCI is represented with 20-30 years maturities, while for CEMBI it is represented with 10+ years maturities. In this respect, we follow maturity classification of the J.P. Morgan, as emerging markets bonds are usually not issued for a very long maturities as in the developed markets.

3.3 Robustness

This section presents robustness exercise in which we divide the full sample into two subsamples: (i) period before the Paris Agreement (31 December, 2012 – 11 December, 2015) and (ii) period after the Paris Agreement (12 December, 2015 – 31 August 2022).¹⁵ Motivation for the subsample analysis comes from the recent studies that provide evidence of a higher importance of climate risks following the Paris Agreement in December 2015 (e.g. Bolton and Kacperczyk 2023; Goldsmith-Pinkhamet al. 2023; Bua et al., 2024). In particular, Bolton and Kacperczyk (2023) find significant and large premium in stock markets only after the Paris agreement, which is consistent with the perception that the Paris agreement represents shift in investors' awareness about the urgency of climate change.

Insert Table 8 here

Table 8 reports the results of the impact of climate risks on the global corporate bond market for two subsample periods (before and after the Paris Agreement). The reported results indicate that before the Paris Agreement the only statistically significant risk is physical risk (Environmental Impact cluster) shown in the aggregate market and investment grade segment. This result suggests that investors focused extensively on physical climate risks such as extreme temperatures, hurricanes, floods, glacier melting, droughts, and shifts in agriculture. These climate-related issues

¹⁵ We performed robustness exercise with two subsamples for the same aspects as in the full sample analyses: (i) market development (developed versus emerging markets); (ii) credit quality (investment grade versus high yield bonds), (iii) industry (climate-sensitive versus non-sensitive industries), and (iv) maturity (short versus long term bonds). In order to save space, we report here only tables for the market development and credit quality aspects, while the results on industry and maturity aspects are available in the Appendix (Tables A2-A9). The industry analysis for two subsample periods is reported in Tables A2-A3 (global corporate bond market) and Tables A6-A7 (emerging corporate bond market). The maturity analysis for two subsample periods is reported in Tables A4-A5 (global corporate bond market) and Tables A8-A9 (emerging corporate bond market).

affected returns in the global corporate bond markets in the period preceding the Paris Agreement. The general importance of physical climate-related risk is documented in the literature (Goldsmith-Pinkham et al., 2019; Stroebel and Wurgler, 2021; Allman, 2022; Duan et al., 2023). After the Paris Agreement the only significant risk is transition risk, shown in the aggregate market and both the investment and high yield segments. Our finding further suggests that in the post-Paris Agreement era, investors shift their attention more towards climate regulations and the transparency of climate-related policies. This shift is reflected in the Business Impact and Societal Debate clusters, which represent transition climate risk. Nasiritousi and Bäckstrand (2019) underscore the Paris Agreement's role in establishing transparent national climate plans and nationally determined contributions (NDCs) to combat climate change.

Insert Table 9 here

Table 9 displays the results of the impact of climate risks on the emerging corporate bond market for two subsample periods (before and after the Paris Agreement). The results demonstrate that physical risk is not significant in any period (neither before nor after the Paris agreement), while transition risk (reflected in Research cluster) has become significant in the aggregate market and investment grade market segment in the period after the Paris Agreement. These results indicate that during the post-Paris Agreement era, emerging markets are gradually beginning to exhibit similar patterns to developed markets with regard to the impact of climate risks on corporate bond markets.

Finally, we examine the impact of the Paris Agreement across various industries and maturities. The industry analysis for the global corporate bond market for two subsample periods (reported in Tables A2 and A3 in the Appendix) confirmed our previous finding of no consistent differences between climate-sensitive and climate-insensitive industries in terms of the exposure of

their bond returns to media-based climate risks. However, it is worth noting that in the period before the Paris agreement several industries show significant coefficients for physical risk (cluster Environmental Impact), while in the period after the Paris Agreement significance is shifted towards transition risk. The corresponding industry analysis for the emerging corporate bond market (reported in Tables A6 and A7 in the Appendix) confirms the previously reported results that in general the industry returns of emerging corporate bond market are not significantly affected by media-based climate risks. The exceptions are Energy and Utilities sectors in post-Paris Agreement era, which supports perception that emerging markets have become gradually to follow the paths set by developed markets. Similar to the full sample analysis, the results show no consistent differences between climate-sensitive and climate-insensitive industries.

The maturity analysis for the global corporate bond market for two subsample periods (reported in Tables A4 and A5 in the Appendix) shows that physical risk exhibits importance for short, medium and long terms only for investment grade bonds during the period before the Paris Agreement, while in the post-Paris Agreement era the importance has shifted towards transition risk. The corresponding maturity analysis for the emerging corporate bond market (reported in Tables A8 and A9 in the Appendix) indicates that in the period after the Paris Agreement there is increasing importance of transition risk in the investment grade segment in all three maturity buckets.

Taken collectively, the results from subsample analysis support the evidence from the literature (Bolton and Kacperczyk 2023; Bua et al., 2024) that the Paris Agreement has been perceived as shifting moment for investors' attention towards urgency of climate change. Furthermore, our findings on emerging corporate bond market provide further insights into importance of the Paris Agreement for increasing awareness of addressing climate change challenges.

4. Conclusions

This study examines the relationship between media-based climate risks and the international corporate bond markets in the contexts of market development (developed versus emerging markets), credit quality (investment grade versus high yield bonds), industry (climate-sensitive versus non-sensitive industries), and maturity (short versus long term bonds). Specifically, we focus on four topic-based clusters of climate change risks (Business Impact, Environmental Impact, Societal Debate, and Research) grouped into physical and transition risk categories.

In summary, taken collectively our results indicate that transition risk, as measured by media-based climate risk, is reflected to some extent in the global corporate bond market (including developed and emerging markets together). However, given the insignificant results for emerging markets segment it might be concluded that significance of the results for the global corporate bond market is driven by developed markets segment. Furthermore, physical risk is not systematically reflected in corporate bond returns, regardless whether market is developed or emerging. Industry-specific analysis reveals that there are no consistent significant differences between climate-sensitive and climate-insensitive industries in terms of the exposure of their bond returns to media-based climate risks. Finally, maturity-specific analysis indicates that transition risk is reflected in global corporate bond market returns for both short and long terms, but however this effect is less pronounced in emerging markets. In particular, the effect in emerging markets is only observed for investment grade bonds, while in high yield category neither of climate change clusters is significant. The results from the subsample analysis (periods before and after the Paris Agreement), taken collectively, show that investors' attention shifted more towards transition risk in the post-Paris Agreement era, confirming common perception of the Paris Agreement as a turning point in increasing awareness of the need to address climate change challenges.

The overall results for emerging corporate bond market confirm that emerging markets in general are trailing behind their developed market counterparts in environmental sustainability and their efforts to address challenges posed by climate change. However, in the period after the Paris Agreement, there is evidence that emerging markets started gradually to follow the paths set by developed markets.

The study has important practical implications for investors and policymakers. In particular, our study might be useful for portfolio managers in terms of risk management and evaluation of the climate change risk and its impact on asset pricing. The lack of consistency in pricing transition and physical climate risks across developed and emerging markets, across industries and across different time horizons, might be of interest of policymakers in designing regulations that should address challenges posed by the climate change. Furthermore, the results of this study might be of particular interest to policymakers in emerging markets as they need to accelerate their climate policy development in order to close the sustainability gap relative to developed markets.

References

- Agliardi, E., & Agliardi, R. (2021). Pricing climate-related risks in the bond market. *Journal of Financial Stability*, 54, 100868.
- Agoraki, K. K., Giaka, M., Konstantios, D., & Negkakis, I. (2024). The relationship between firm-level climate change exposure, financial integration, cost of capital and investment efficiency. *Journal of International Money and Finance*, 141, 102994.
- Alekseev, G., Giglio, S., Maingi, Q., Selgrad, J., & Stroebel, J. (2022). A quantity-based approach to constructing climate risk hedge portfolios. NBER Working Paper No. 30703.
- Allman, E. (2022). Pricing climate change risk in corporate bonds. *Journal of Asset Management*, 23(7), 596-618.
- Ardia, D., Bluteau, K., Boudt, K., & Inghelbrecht, K. (2022). Climate change concerns and the performance of green versus brown stocks. *Management Science*, 69, Issue 12, 7607-7632.
- Baldauf, M., Garlappi, L., & Yannelis, C. (2020). Does climate change affect real estate prices? Only if you believe in it. *The Review of Financial Studies*, 33(3), 1256-1295.
- Battiston, S., Mandel, A., Monasterolo, I., Schütze, F., & Visentin, G. (2017). A climate stress-test of the financial system. *Nature Climate Change*, 7(4), 283-288.
- Bao, J., Pan, J. & Wang, J. (2011). The illiquidity of corporate bonds. *The Journal of Finance*, 66(3), 911–946.
- Barnett, M., Brock, W., & Hansen, L. P. (2020). Pricing uncertainty induced by climate change. *The Review of Financial Studies*, 33(3), 1024-1066.
- Bats, J. V., Bua, G., & Kapp, D. (2024). Physical and transition risk premiums in euro area corporate bond markets. European Central Bank Working paper 2899.
- Bauer, M. D., & Rudebusch, G. D. (2023). The rising cost of climate change: evidence from the bond market. *Review of Economics and Statistics*, 105(5), 1255-1270.
- Baur, D. G., & Smales, L. A. (2020). Hedging geopolitical risk with precious metals. *Journal of Banking & Finance*, 117, 105823.
- Bekaert, G., & De Santis, R. A. (2021). Risk and return in international corporate bond markets. *Journal of International Financial Markets, Institutions and Money*, 72, 101338.
- Bessec, M., & Fouquau, J. (2024). A Green Wave in Media: A Change of Tack in Stock Markets. *Oxford Bulletin of Economics and Statistics*. <https://doi.org/10.1111/obes.12597>

- Bua, G., Kapp, D., Ramella, F., & Rognone, L. (2024). Transition versus physical climate risk pricing in European financial markets: A text-based approach. *The European Journal of Finance*, 1-35.
- Bhanot, K. (2005). What causes mean reversion in corporate bond index spreads? The impact of survival. *Journal of Banking & Finance*, 29(6), 1385-1403.
- Bolton, P., & Kacperczyk, M. (2021). Do investors care about carbon risk? *Journal of Financial Economics*, 142(2), 517-549.
- Bolton, P., & Kacperczyk, M. (2023). Global pricing of carbon - transition risk. *The Journal of Finance*, 78(6), 3677-3754.
- Boubaker, S., Nguyen, D.C., Piljak, V., Savvides, A. (2019). Financial development, government bond returns, and stability: International evidence. *Journal of International Financial Markets, Institutions and Money*, 61, 81–96.
- Campos-Martins S., & Hendry D. (2021). Geoclimate, geopolitics, and the geovolatility of carbon-intensive equity returns. Working paper, University of Oxford, Oxford, UK.
- Christiansen, C. (2007). Volatility - spillover effects in European bond markets. *European Financial Management*, 13(5), 923-948.
- Dick-Nielsen, J., Feldhutter, P. & Lando, D. (2012). Corporate bond liquidity before and after the onset of the subprime crisis. *Journal of Financial Economics*, 103, 471-492.
- Dietz, S., Bowen, A., Dixon, C., & Gradwell, P. (2016). Climate value at risk' of global financial assets. *Nature Climate Change*, 6(7), 676-679.
- Dimic, N., Kiviaho, J., Piljak, V., Äijö, J. (2016). Impact of financial market uncertainty and macroeconomic factors on stock–bond correlation in emerging markets. *Research in International Business and Finance*, 36, 41–51.
- Dimic, N., Piljak, V., Swinkels, L., & Vulcanovic, M. (2021). The structure and degree of dependence in government bond markets. *Journal of International Financial Markets, Institutions and Money*, 74, 101385.
- Di Giuli, A., & Kostovetsky, L. (2014). Are red or blue companies more likely to go green? Politics and corporate social responsibility. *Journal of Financial Economics*, 111(1), 158-180.
- Duan, T., Li, F. W., & Wen, Q. (2021). Is Carbon Risk Priced in the Cross Section of Corporate Bond Returns?. *Journal of Financial and Quantitative Analysis*, 1-35.
- Engle, R. F., Giglio, S., Kelly, B., Lee, H., & Stroebel, J. (2020). Hedging climate change news. *The Review of Financial Studies*, 33(3), 1184-1216.

- Faccini, R., Matin, R., & Skiadopoulos, G. (2023). Dissecting climate risks: Are they reflected in stock prices? *Journal of Banking & Finance*, 155, 106948.
- Fama, E. & French, K. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33, 3–56.
- Giese, G., Nagy, Z., & Rautis, B. (2021). Foundations of Climate Investing: How Equity Markets Have Priced Climate-Transition Risks. *The Journal of Portfolio Management* 47 (9): 35–53.
- Giglio, S., Kelly, B., & Stroebel, J. (2021). Climate finance. *Annual Review of Financial Economics*, 13, 15-36.
- Giglio, S., Maggiori, M., Rao, K., Stroebel, J., & Weber, A. (2021). Climate change and longrun discount rates: evidence from real estate. *The Review of Financial Studies*, 34 (8), 3527–3571.
- Goldsmith-Pinkham, P.S., Gustafson, M., Lewis, R., & Schwert, M. (2023). Sea level rise exposure and municipal bond yields. *The Review of Financial Studies*, 36, 4588-4635.
- Graff Zivin, J., & Neidell, M. (2014). Temperature and the allocation of time: implications for climate change. *Journal of Labor Economics*, 32 (1), 1–26.
- Hong, H., Karolyi, G. A., & Scheinkman, J. A. (2020). Climate finance. *The Review of Financial Studies*, 33(3), 1011-1023.
- Huang, J. Z., & Shi, Z. (2021). What do we know about corporate bond returns? *Annual Review of Financial Economics*, 13, 363-399.
- Huynh, T. D., & Xia, Y. (2021). Climate change news risk and corporate bond returns. *Journal of Financial and Quantitative Analysis*, 56(6), 1985-2009.
- Kapfhammer, F., Larsen, V. H., & Thorsrud, L. A. (2020). Climate risk and commodity currencies. CESifo Working Paper No. 8788, Available at SSRN: <https://ssrn.com/abstract=3754679>
- Kim, S. J., Lucey, B. M., & Wu, E. (2006). Dynamics of bond market integration between established and accession European Union countries. *Journal of International Financial Markets, Institutions and Money*, 16(1), 41-56.
- Krueger, P., Sautner, Z., & Starks, L. T. (2020). The importance of climate risks for institutional investors. *The Review of Financial Studies*, 33(3), 1067-1111.
- Kölbel, J. F., Leippold, M., Rillaerts, J., & Wang, Q. (2024). Ask BERT: How regulatory disclosure of transition and physical climate risks affects the CDS term structure. *Journal of Financial Econometrics*, 22(1), 30-69.
- Li, Q., Shan, H., Tang, Y., & Yao, V. (2024). Corporate climate risk: Measurements and responses. *The Review of Financial Studies*, 00, 1-53.

- Lin, H., Wu, C. & Zhou, G. (2018). Forecasting corporate bond returns with a large set of predictors: An iterated combination approach. *Management Science*, 64 (9): 4128–4238.
- Liu, H., & Lin, C. (2023). Climate change news risk and corporate bond returns in China. *Finance Research Letters*, 58, 104526.
- Mastouri, A., Mendiratta, R., & Giese, G. (2022). Corporate Bonds and Climate-Change Risk. *The Journal of Portfolio Management*.
- Murfin, J., & Spiegel, M. (2020). Is the risk of sea level rise capitalized in residential real estate?. *The Review of Financial Studies*, 33(3), 1217-1255.
- Nasiritousi, N., & Bäckstrand, K. (2019). International climate politics in the post-Paris era. *Nordic Economic Policy Review*, 13(19), 21-62.
- Painter, M. (2020). An inconvenient cost: The effects of climate change on municipal bonds. *Journal of Financial Economics*, 135(2), 468-482.
- Panchenko, V., & Wu, E. (2009). Time-varying market integration and stock and bond return concordance in emerging markets. *Journal of Banking and Finance*, 33, 1014–1021.
- Pankratz, N., R. Bauer, & Derwall, J. (2023). Climate Change, Firm Performance, and Investor Surprises. *Management Science*. <https://doi.org/10.1287/mnsc.2023.4685>.
- Pástor, L., Stambaugh, R. F., & Taylor, L. A. (2022). Dissecting green returns. *Journal of Financial Economics*, 146(2), 403-424.
- Piljak, V. (2013). Bond markets co-movement dynamics and macroeconomic factors: Evidence from emerging and frontier markets. *Emerging Markets Review*, 17, 29–43.
- Piljak, V., & Swinkels, L. (2017). Frontier and emerging government bond markets. *Emerging Markets Review*, 30, 232-255.
- Reinders, H. J., Schoenmaker, D., & Van Dijk, M. (2023). A finance approach to climate stress testing. *Journal of International Money and Finance*, 131, 102797.
- Sautner, Z., van Lent, L., Vilkov, G., & Zhang, R. (2023). Firm-level climate change exposure. *Journal of Finance*, 78 (3), 1449–1498.
- Schularick, M., & Taylor, A. M. (2012). Credit booms gone bust: monetary policy, leverage cycles, and financial crises, 1870–2008. *American Economic Review*, 102(2), 1029-1061.
- Seltzer, L. H., Starks, L., & Zhu, Q. (2022). Climate regulatory risk and corporate bonds. Working Paper No. w29994. *National Bureau of Economic Research*.

Stroebel, J., Wurgler, J. (2021). What do you think about climate finance? *Journal of Financial Economics*, 142 (2), 487–498.

Tansan, B., Lang, N., Meyer, M., Gökbulut, A., Ivers, L., Hutchinson, R., Santamarta, S., Azevedo, D., & Chan, T. (2023). The Sustainability Imperative in Emerging Markets. Boston Consulting Group. <https://www.bcg.com/publications/2023/the-importance-of-sustainability-in-business>

United Nations Framework Convention on Climate Change 2023 (COP27). <https://www.un.org/en/climatechange/cop27>

Ye, Y., Zhu, J., Li, B., & Yang, X. (2023). Extreme climate risks and corporate bond yield spreads: evidence from China. *Asia-Pacific Journal of Accounting & Economics*, 1-21.

Zhou, Y. (2014). Modeling the joint dynamics of risk-neutral stock index and bond yield volatilities. *Journal of Banking & Finance*, 38, 216-228.

Table 1. Descriptive statistics

This table reports descriptive statistics of our variables (mean, standard deviation, minimum, and maximum) for the sample period from December 31, 2012, to August 31, 2022 (total of 2416 daily observations). Panel A shows daily index returns for the global corporate bond market (including developed and emerging markets together) on the aggregate level (GCI Aggregate), tracking performance of USD-denominated corporate bonds, further divided into investment grade (GCI IG) and high yield (GCI HY) segments. Panel B contains daily index returns for GCI industry sub-indices. Panel C shows daily index returns for GCI IG and GCI HY further divided into different maturities (short:1-3 years; medium: 7-10 years, and long: 20-30 years). Panel D contains daily index returns for the emerging corporate bond market on the aggregate level (CEMBI Aggregate), tracking performance of USD-denominated corporate bonds from emerging markets, further divided into investment grade (CEMBI IG) and high yield (CEMBI HY) segments. Panel E reports daily index returns for CEMBI industry sub-indices. Panel F shows daily index returns for CEMBI IG and CEMBI HY further divided into different maturities (short:1-3 years; medium: 7-10 years, and long: 10+ years). Panel G displays climate change risks clusters by Ardia et al. (2023): Business Impact, Environmental Impact, Societal Debate, and Research. Panel H reports control variables: default spread, global liquidity conditions (US Federal Funds Rate), global bond market volatility (MOVE Index), term spread, and global bond market returns (GABI). All returns reported in Panels A, B, C, D, E, and F are calculated as the first logarithmic difference of the bond price indices.

	Mean	Std. dev.	Min	Max
Panel A. Global corporate bond market				
GCI Aggregate	0,000098	0,002476	-0,034362	0,016069
GCI IG	0,000085	0,002728	-0,034452	0,015162
GCI HY	0,000146	0,002947	-0,034028	0,029062
Panel B. Global corporate bond market - Industries				
GCI Automotive	0,000105	0,001831	-0,02554	0,018331
GCI Banks	0,000098	0,001821	-0,025787	0,013611
GCI Basic Industries	0,000113	0,002510	-0,032185	0,01835
GCI Cable/Media	0,000111	0,003068	-0,041951	0,030824
GCI Capital Goods	0,000108	0,002464	-0,035726	0,01779
GCI Consumer	0,000102	0,002734	-0,037449	0,018698
GCI Energy	0,000067	0,003499	-0,07113	0,023295
GCI Non-Bank Financials	0,000124	0,002390	-0,029554	0,013987
GCI Pharma/Healthcare	0,000095	0,003034	-0,038311	0,020163
GCI Real Estate	0,000053	0,002370	-0,025981	0,021676

GCI Technology	0,000104	0,002742	-0,034264	0,01876
GCI Transport	0,000117	0,002886	-0,037814	0,015677
GCI Telecom	0,000111	0,003187	-0,043127	0,028806
GCI Utilities	0,000097	0,003418	-0,038291	0,021398
Panel C. Global corporate bond market - Maturities				
GCI IG 1-3	0,000062	0,00065	-0,009447	0,005273
GCI IG 7-10	0,000090	0,002953	-0,037194	0,013699
GCI IG 20-30	0,000098	0,005978	-0,068623	0,032959
GCI HY 1-3	0,000118	0,002042	-0,025035	0,019823
GCI HY 7-10	0,000152	0,003600	-0,037946	0,033447
GCI HY 20-30	0,000295	0,004355	-0,053551	0,03517
Panel D. Emerging corporate bond market				
CEMBI Aggregate	0,000109	0,001943	-0,029405	0,012695
CEMBI IG	0,000086	0,001923	-0,027566	0,008742
CEMBI HY	0,000114	0,002756	-0,039682	0,021055
Panel E. Emerging corporate bond market - Industries				
CEMBI Automotive	0,000100	0,001692	-0,030511	0,013307
CEMBI Banks	0,000138	0,001429	-0,018321	0,006964
CEMBI Basic Industries	0,000101	0,003080	-0,042757	0,020325
CEMBI Cable/Media	0,000147	0,003487	-0,056658	0,044294
CEMBI Capital Goods	0,000126	0,001650	-0,028486	0,00943
CEMBI Consumer	0,000096	0,002416	-0,032741	0,015707
CEMBI Energy	0,000067	0,003657	-0,055893	0,02089
CEMBI Non-Bank Financials	0,000140	0,001556	-0,022599	0,006381
CEMBI Pharma/Healthcare	0,000077	0,004848	-0,060414	0,056768
CEMBI Real Estate	0,000068	0,002576	-0,023882	0,025326
CEMBI Technology	0,000114	0,002095	-0,022118	0,011008
CEMBI Telecom	0,000096	0,002309	-0,028628	0,01625
CEMBI Transportation	0,000115	0,002601	-0,040413	0,010579
CEMBI Utilities	0,000001	0,002843	-0,017515	0,011116

Panel F. Emerging corporate bond market - Maturities

CEMBI IG 1-3	0,000053	0,001371	-0,037652	0,005037
CEMBI IG 7-10	0,000095	0,002421	-0,034624	0,010456
CEMBI IG 10+	0,000123	0,003521	-0,055475	0,021886
CEMBI HY 1-3	0,000106	0,002289	-0,030221	0,012741
CEMBI HY 7-10	0,000131	0,003544	-0,053747	0,026875
CEMBI HY 10+	0,000158	0,002448	-0,03118	0,015352

Panel G. Climate change risk clusters

Cluster Business Impact	0,732503	0,418427	0	3,298719
Cluster Environmental Impact	0,695574	0,447991	0	3,08638
Cluster Societal Debate	0,784338	0,479131	0	3,393216
Cluster Research	0,587775	0,398824	0	4,257053

Panel H. Control variables

Default Spread	2,390319	0,443231	1,56	4,31
Federal Fund Rate	0,695778	0,798288	0,04	2,45
MOVE	0,000135	0,019320	-0,130367	0,162044
Term Spread	1,407913	0,800686	-0,52	2,97
GABI	0,000001	0,002849	-0,02275	0,015318

Table 2. Global corporate bond market

This table reports the estimation results for global corporate bond market from Equation (1). The Column (1) shows the results where the dependent variable is the daily return on GCI Aggregate, Column (2) reports the results for GCI IG, and Column (3) shows the results for GCI HY. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1) GCI Aggregate	(2) GCI IG	(3) GCI HY
Default Spread	0.00019 (1.47915)	0.00022 (1.54263)	0.00005 (0.30407)
Federal Funds Rate	-0.00006 (-0.64346)	-0.00004 (-0.33937)	-0.00018 (-1.60966)
MOVE	-0.02922*** (-11.55220)	-0.02559*** (-9.08643)	-0.04643*** (-15.69047)
Term Spread	-0.00031*** (-3.26719)	-0.00030*** (-2.89373)	-0.00033*** (-2.97880)
Cluster Business Impact	0.00034* (1.83479)	0.00037* (1.74950)	0.00024 (1.09097)
Cluster Environmental Impact	0.00018 (0.99529)	0.00022 (1.07502)	0.00004 (0.16585)
Cluster Societal Debate	-0.00035** (-2.00631)	-0.00036* (-1.82000)	-0.00034 (-1.63615)
Cluster Research	-0.00029 (-1.42448)	-0.00033 (-1.41373)	-0.00016 (-0.66668)
<i>N</i>	2416	2416	2416
<i>r</i> ²	0.06210	0.04199	0.09754

Table 3. Global corporate bond market - Industry analysis

This table reports the estimation results for global corporate bond market from Equation (2) where the dependent variable is industry-specific daily return on GCI industry sub-indices. There are 14 different industry sub-indices represented in Columns (1-14). ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GCI Automotive	GCI Banks	GCI Basic Industries	GCI Cable/Media	GCI Capital Goods	GCI Consumer	GCI Energy
Default Spread	0.00001 (0.12398)	0.00023** (2.49752)	0.00011 (0.88852)	0.00026* (1.70731)	0.00015 (1.19601)	0.00024* (1.71879)	-0.00015 (-0.85924)
Federal Funds Rate	-0.00015** (-2.09782)	0.00001 (0.07939)	-0.00016* (-1.66064)	0.00000 (0.00719)	-0.00009 (-0.89839)	-0.00006 (-0.58888)	-0.00031** (-2.31339)
MOVE	-0.01952*** (-10.36754)	-0.02096*** (-11.24255)	-0.03319*** (-13.06077)	-0.04411*** (-14.25762)	-0.02385*** (-9.38554)	-0.02751*** (-9.77803)	-0.04987*** (-14.09205)
Term Spread	-0.00028*** (-3.94403)	-0.00019*** (-2.71781)	-0.00045*** (-4.69621)	-0.00029** (-2.52411)	-0.00032*** (-3.33789)	-0.00033*** (-3.17480)	-0.00048*** (-3.66135)
Cluster Business Impact	0.00024* (1.74523)	0.00026* (1.86379)	0.00029 (1.51326)	0.00044* (1.92055)	0.00034* (1.82388)	0.00037* (1.76970)	0.00034 (1.28384)
Cluster Environmental Impact	0.00015 (1.14416)	0.00010 (0.75212)	0.00019 (1.05141)	0.00020 (0.87943)	0.00025 (1.39005)	0.00023 (1.11598)	0.00024 (0.94316)
Cluster Societal Debate	-0.00028** (-2.16506)	-0.00023* (-1.77174)	-0.00046*** (-2.57963)	-0.00039* (-1.81030)	-0.00035** (-1.99689)	-0.00035* (-1.78725)	-0.00053** (-2.13800)
Cluster Research	-0.00021 (-1.39237)	-0.00018 (-1.18144)	-0.00030 (-1.43309)	-0.00039 (-1.56288)	-0.00032 (-1.53880)	-0.00038* (-1.64807)	-0.00024 (-0.81928)
<i>N</i>	2416	2416	2416	2416	2416	2416	2416
<i>r</i> ²	0.05205	0.05987	0.08014	0.08586	0.04504	0.04828	0.08282

	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	GCI Non-Bank Financials	GCI Pharma/ Healthcare	GCI Real Estate	GCI Technology	GCI Transportation	GCI Telecom	GCI Utilities
Default Spread	0.00016 (1.26465)	0.00030* (1.88899)	0.00024* (1.92524)	0.00035** (2.50052)	0.00008 (0.53799)	0.00033** (2.04978)	0.00024 (1.35006)
Federal Funds Rate	-0.00006 (-0.62016)	-0.00003 (-0.23701)	0.00009 (0.96546)	0.00002 (0.17416)	-0.00011 (-0.99859)	-0.00000 (-0.01766)	-0.00005 (-0.39550)
MOVE	-0.02283*** (-9.24969)	-0.03127*** (-10.02467)	-0.01883*** (-7.65413)	-0.02604*** (-9.21247)	-0.02273*** (-7.57788)	-0.04141*** (-12.79175)	-0.02979*** (-8.41547)
Term Spread	-0.00029*** (-3.12554)	-0.00033*** (-2.84964)	-0.00017* (-1.84774)	-0.00026** (-2.44602)	-0.00033*** (-2.91311)	-0.00034*** (-2.84069)	-0.00036*** (-2.75494)
Cluster Business Impact	0.00031* (1.71393)	0.00042* (1.81926)	0.00021 (1.17688)	0.00042** (1.99864)	0.00029 (1.29415)	0.00048** (2.00680)	0.00050* (1.89877)
Cluster Environmental Impact	0.00017 (0.95267)	0.00018 (0.79685)	-0.00000 (-0.02562)	0.00022 (1.07590)	0.00025 (1.17858)	0.00016 (0.70297)	0.00026 (1.02071)
Cluster Societal Debate	-0.00034** (-1.97105)	-0.00036* (-1.65090)	-0.00015 (-0.87132)	-0.00033* (-1.66262)	-0.00029 (-1.37213)	-0.00045** (-2.01421)	-0.00050** (-2.04706)
Cluster Research	-0.00025 (-1.23004)	-0.00039 (-1.51307)	-0.00037* (-1.82132)	-0.00039* (-1.69701)	-0.00038 (-1.55212)	-0.00026 (-0.97902)	-0.00035 (-1.21089)
<i>N</i>	2416	2416	2416	2416	2416	2416	2416
<i>r</i> ²	0.04299	0.04933	0.03335	0.04418	0.03013	0.07283	0.03651

Table 4. Global corporate bond market - Maturity analysis

This table reports the estimation results for global corporate bond market from Equation (3) where the dependent variable is maturity-specific daily return on GCI maturity buckets sub-indices. Columns (1-3) show the results for GCI IG in short, medium, and long term, respectively. Columns (4-6) report the results for GCI HY in short, medium, and long term, respectively. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	GCI IG 1-3	GCI IG 7-10	GCI IG 20-30	GCI HY 1-3	GCI HY 7-10	GCI HY 20-30
Default Spread	0.00008** (2.48502)	0.00026* (1.69505)	0.00033 (1.05842)	0.00013 (1.22340)	0.00020 (1.10217)	0.00001 (0.04229)
Federal Funds Rate	0.00002 (0.66531)	-0.00003 (-0.27552)	-0.00011 (-0.48609)	-0.00001 (-0.13175)	-0.00015 (-1.13335)	-0.00044*** (-2.67298)
MOVE	-0.00384*** (-5.67111)	-0.02873*** (-9.44222)	-0.05451*** (-8.81570)	-0.02529*** (-12.09665)	-0.05964*** (-16.60022)	-0.06489*** (-14.78687)
Term Spread	-0.00008*** (-3.14073)	-0.00034*** (-3.01148)	-0.00057** (-2.47325)	-0.00013 (-1.64486)	-0.00039*** (-2.88284)	-0.00069*** (-4.18306)
Cluster Business Impact	0.00006 (1.24090)	0.00042* (1.85091)	0.00084* (1.83134)	0.00011 (0.73178)	0.00042 (1.56875)	0.00042 (1.28103)
Cluster Environmental Impact	0.00002 (0.35538)	0.00030 (1.38593)	0.00047 (1.06637)	-0.00004 (-0.28728)	0.00007 (0.28044)	-0.00006 (-0.19731)
Cluster Societal Debate	-0.00009* (-1.80720)	-0.00044** (-2.08112)	-0.00067 (-1.55594)	-0.00007 (-0.51486)	-0.00048* (-1.90901)	-0.00077** (-2.53831)
Cluster Research	-0.00002 (-0.44314)	-0.00042* (-1.70789)	-0.00080 (-1.58922)	-0.00024 (-1.39865)	-0.00014 (-0.49048)	0.00009 (0.25768)
<i>N</i>	2416	2416	2416	2416	2416	2416
<i>r</i> ²	0.02616	0.04619	0.03788	0.06224	0.10823	0.09117

Table 5. Emerging corporate bond market

This table reports the estimation results for emerging corporate bond market from Equation (1), where the Column (1) shows the results where the dependent variable is the daily return on CEMBI Aggregate, Column (2) reports the results for CEMBI IG, and Column (3) shows the results for CEMBI HY. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1) CEMBI Aggregate	(2) CEMBI IG	(3) CEMBI HY
Default Spread	-0.00007 (-0.75818)	0.00001 (0.10208)	-0.00019 (-1.37758)
Federal Funds Rate	-0.00007 (-1.00473)	0.00001 (0.22847)	-0.00018* (-1.70071)
MOVE	-0.01885*** (-10.52462)	-0.01372*** (-8.13522)	-0.02978*** (-10.78234)
Term Spread	-0.00016** (-2.44298)	-0.00012* (-1.94700)	-0.00024** (-2.32638)
GABI	0.29738*** (24.37753)	0.35523*** (30.92209)	0.23036*** (12.24547)
Cluster Business Impact	-0.00002 (-0.17121)	0.00007 (0.52437)	-0.00018 (-0.88658)
Cluster Environmental Impact	-0.00004 (-0.32853)	0.00005 (0.43045)	-0.00012 (-0.60894)
Cluster Societal Debate	-0.00004 (-0.31045)	-0.00008 (-0.72975)	0.00002 (0.11065)
Cluster Research	-0.00006 (-0.41204)	-0.00014 (-0.99667)	-0.00002 (-0.07506)
<i>N</i>	2416	2416	2416
<i>r</i> ²	0.25251	0.32283	0.11742

Table 6. Emerging corporate bond market - Industry analysis

This table reports the estimation results for emerging corporate bond market from Equation (2), where the dependent variable is industry-specific daily return on CEMBI industry sub-indices. There are 14 different industry sub-indices represented in Columns (1-14). CEMBI Utilities has shorter time of data availability (564 observations).***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	CEMBI Automotive	CEMBI Banks	CEMBI Basic Industries	CEMBI Cable/Media	CEMBI Capital Goods	CEMBI Consumer	CEMBI Energy
Default Spread	-0.00015*	-0.00002	-0.00011	0.00007	-0.00011	-0.00001	-0.00008
	(-1.81798)	(-0.30400)	(-0.71768)	(0.45116)	(-1.43190)	(-0.10489)	(-0.46587)
Federal Funds Rate	-0.00010*	-0.00001	-0.00016	-0.00003	-0.00007	-0.00008	-0.00006
	(-1.66985)	(-0.10618)	(-1.44720)	(-0.22020)	(-1.24585)	(-0.97967)	(-0.47639)
MOVE	0.00172	-0.01092***	-0.03194***	-0.03554***	-0.00965***	-0.01427***	-0.04124***
	(1.04708)	(-7.92573)	(-10.52213)	(-10.76874)	(-6.36343)	(-6.17469)	(-11.66799)
Term Spread	-0.00020***	-0.00007	-0.00033***	-0.00018	-0.00015***	-0.00025***	-0.00017
	(-3.28892)	(-1.43856)	(-2.89104)	(-1.49867)	(-2.62847)	(-2.86268)	(-1.29726)
GABI	0.23796***	0.18999***	0.31235***	0.47030***	0.27459***	0.33502***	0.42357***
	(21.21676)	(20.24703)	(15.10595)	(20.92237)	(26.57795)	(21.27731)	(17.59405)
Cluster Business Impact	0.00005	-0.00005	-0.00003	0.00021	0.00001	-0.00004	-0.00012
	(0.38175)	(-0.46139)	(-0.11226)	(0.86671)	(0.11681)	(-0.22062)	(-0.44413)
Cluster Environmental Impact	0.00012	-0.00005	0.00004	-0.00008	-0.00010	-0.00023	0.00013
	(0.99849)	(-0.54794)	(0.20474)	(-0.35547)	(-0.88656)	(-1.40297)	(0.51688)
Cluster Societal Debate	-0.00029**	0.00006	-0.00015	-0.00025	-0.00016	0.00002	0.00010
	(-2.56206)	(0.68469)	(-0.70664)	(-1.10491)	(-1.54204)	(0.13391)	(0.41392)
Cluster Research	0.00004	-0.00002	-0.00020	-0.00010	0.00011	-0.00003	-0.00033
	(0.32577)	(-0.16626)	(-0.80879)	(-0.38215)	(0.91831)	(-0.13518)	(-1.15249)
<i>N</i>	2416	2416	2416	2416	2416	2416	2416
<i>r</i> ²	0.16831	0.18327	0.14598	0.21138	0.25707	0.19023	0.17873

	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	CEMBI Non-Bank Financials	CEMBI Pharma/Healthcare	CEMBI Real Estate	CEMBI Technology	CEMBI Telecom	CEMBI Transportation	CEMBI Utilities
Default Spread	-0.00010 (-1.45072)	-0.00005 (-0.22236)	0.00011 (0.83250)	-0.00006 (-0.62267)	-0.00012 (-1.13132)	-0.00043*** (-3.32555)	-0.00019 (-0.34461)
Federal Funds Rate	-0.00003 (-0.58049)	-0.00024 (-1.36522)	0.00008 (0.81494)	-0.00005 (-0.64831)	-0.00017** (-2.08864)	-0.00018* (-1.88791)	-0.00060*** (-2.69193)
MOVE	-0.00244* (-1.71774)	-0.04120*** (-8.60699)	-0.00884*** (-3.42217)	-0.00763*** (-3.83100)	-0.02113*** (-9.78149)	-0.01258*** (-4.85182)	-0.00426 (-0.78893)
Term Spread	-0.00009* (-1.75873)	-0.00025 (-1.40069)	-0.00002 (-0.18930)	-0.00015** (-2.02874)	-0.00023*** (-2.90645)	-0.00020** (-2.03113)	-0.00114*** (-3.20775)
GABI	0.27767*** (28.70632)	0.53490*** (16.40818)	0.28768*** (16.34327)	0.31653*** (23.34245)	0.33738*** (22.92780)	0.29819*** (16.88309)	0.19868*** (4.77867)
Cluster Business Impact	0.00003 (0.24894)	-0.00005 (-0.13719)	-0.00001 (-0.06035)	0.00011 (0.75412)	-0.00010 (-0.62408)	-0.00019 (-0.98250)	0.00042 (0.91078)
Cluster Environmental Impact	-0.00003 (-0.30684)	-0.00006 (-0.16745)	-0.00019 (-1.01188)	-0.00018 (-1.25139)	0.00001 (0.07041)	-0.00017 (-0.94385)	0.00038 (1.04644)
Cluster Societal Debate	-0.00024** (-2.42410)	-0.00015 (-0.44159)	0.00017 (0.98100)	-0.00006 (-0.44855)	-0.00007 (-0.45756)	-0.00007 (-0.41454)	-0.00000 (-0.00893)
Cluster Research	0.00014 (1.18911)	-0.00003 (-0.07603)	-0.00021 (-0.98361)	0.00000 (0.01220)	-0.00004 (-0.20142)	0.00024 (1.13684)	-0.00099** (-2.33183)
<i>N</i>	2416	2416	2416	2416	2416	2416	564
<i>r</i> ²	0.26807	0.14188	0.11543	0.20321	0.22997	0.12752	0.10606

Table 7. Emerging corporate bond market - Maturity analysis

This table reports the estimation results for emerging corporate bond market from Equation (3), where the dependent variable is maturity-specific daily return on CEMBI maturity buckets sub-indices. Columns (1-3) show the results for CEMBI IG in short, medium, and long term, respectively. Columns (4-6) report the results for CEMBI HY in short, medium, and long term, respectively. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	CEMBI IG 1-3	CEMBI IG 7-10	CEMBI IG 10+	CEMBI HY 1-3	CEMBI HY 7-10	CEMBI HY 10+
Default Spread	0.00012*	-0.00001	-0.00020	-0.00009	-0.00014	-0.00016
	(1.69767)	(-0.05163)	(-1.38975)	(-0.75452)	(-0.83625)	(-1.30227)
Federal Funds Rate	0.00011**	-0.00001	-0.00010	-0.00011	-0.00022*	-0.00010
	(1.99935)	(-0.17239)	(-0.93550)	(-1.22466)	(-1.71639)	(-1.11589)
MOVE	-0.00325**	-0.01650***	-0.03191***	-0.01798***	-0.04163***	-0.02659***
	(-2.27687)	(-7.93715)	(-10.99050)	(-7.60116)	(-11.93736)	(-10.86687)
Term Spread	0.00002	-0.00018**	-0.00032***	-0.00015*	-0.00036***	-0.00020**
	(0.35257)	(-2.27545)	(-2.94026)	(-1.75698)	(-2.77486)	(-2.25851)
GABI	0.09103***	0.46971***	0.71572***	0.13471***	0.34241***	0.21131***
	(9.35582)	(33.16897)	(36.19519)	(8.36241)	(14.41521)	(12.67748)
Cluster Business Impact	-0.00007	0.00018	0.00029	-0.00021	-0.00014	-0.00010
	(-0.70906)	(1.19095)	(1.36720)	(-1.22405)	(-0.55940)	(-0.54697)
Cluster Environmental Impact	0.00010	0.00008	-0.00002	-0.00007	-0.00018	-0.00009
	(0.98874)	(0.53478)	(-0.11356)	(-0.44484)	(-0.74562)	(-0.53125)
Cluster Societal Debate	0.00012	-0.00018	-0.00038*	0.00019	-0.00013	-0.00016
	(1.22574)	(-1.25938)	(-1.89732)	(1.14788)	(-0.52994)	(-0.95083)
Cluster Research	-0.00025**	-0.00018	-0.00004	-0.00020	0.00019	0.00011
	(-2.15785)	(-1.04625)	(-0.16817)	(-1.04990)	(0.66385)	(0.55431)
<i>N</i>	2416	2416	2416	2416	2416	2416
<i>r</i> ²	0.04761	0.35035	0.40078	0.06253	0.14860	0.12239

Table 8. Global corporate bond market (before and after the Paris Agreement)

This table reports the estimation results for global corporate bond market from Equation (1) for two subsample periods: (i) before the Paris Agreement (31 December, 2012 – 11 December, 2015) and (ii) period after the Paris Agreement (12 December, 2015 – 31 August, 2022). The Columns (1-2) show the results where the dependent variable is the daily return on GCI Aggregate, Columns (3-4) report the results for GCI IG, and Columns (5-6) show the results for GCI HY. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1) <u>GCI Aggregate</u> (Before Paris)	(2) <u>GCI Aggregate</u> (After Paris)	(3) <u>GCI IG</u> (Before Paris)	(4) <u>GCI IG</u> (After Paris)	(5) GCI HY (Before Paris)	(6) GCI HY (After Paris)
Default Spread	-0.001** (-2.092)	0.000 (1.305)	-0.001* (-1.753)	0.000 (1.181)	-0.001* (-1.795)	0.000 (1.044)
Federal Funds Rate	-0.010** (-2.328)	-0.000 (-0.939)	-0.011** (-2.146)	-0.000 (-0.775)	-0.005 (-1.082)	-0.000 (-1.221)
MOVE	-0.038*** (-10.534)	-0.027*** (-8.271)	-0.041*** (-9.239)	-0.021*** (-5.958)	-0.028*** (-7.068)	-0.053*** (-13.837)
Term Spread	-0.001*** (-3.262)	-0.001*** (-3.997)	-0.001*** (-2.987)	-0.001*** (-3.969)	-0.001 (-1.633)	-0.000** (-2.232)
Cluster Business Impact	0.000 (0.074)	0.001** (2.234)	0.000 (0.329)	0.001** (2.059)	-0.000 (-1.119)	0.001* (1.751)
Cluster Environmental Impact	0.001** (2.071)	0.000 (0.757)	0.001** (1.966)	0.000 (0.873)	0.000 (0.720)	-0.000 (-0.031)
Cluster Societal Debate	0.000 (0.064)	-0.000* (-1.781)	0.000 (0.237)	-0.000* (-1.710)	-0.000 (-0.747)	-0.000 (-1.225)
Cluster Research	-0.000 (-1.645)	-0.000 (-1.489)	-0.001 (-1.531)	-0.000 (-1.509)	-0.000 (-0.703)	-0.000 (-0.680)
<i>N</i>	738	1678	738	1678	738	1678
<i>r</i> ²	0.149	0.057	0.119	0.039	0.085	0.109

Table 9. Emerging corporate bond market (before and after the Paris Agreement)

This table reports the estimation results for emerging corporate bond market from Equation (1) for two subsample periods: (i) before the Paris Agreement (31 December, 2012 – 11 December, 2015) and (ii) period after the Paris Agreement (12 December, 2015 – 31 August, 2022). The Columns (1-2) show the results where the dependent variable is the daily return on CEMBI Aggregate, Columns (3-4) report the results for CEMBI IG, and Columns (5-6) show the results for CEMBI HY. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1) <u>CEMBI Aggregate</u> (Before Paris)	(2) <u>CEMBI Aggregate</u> (After Paris)	(3) <u>CEMBI IG</u> (Before Paris)	(4) <u>CEMBI IG</u> (After Paris)	(5) <u>CEMBI HY</u> (Before Paris)	(6) <u>CEMBI HY</u> (After Paris)
Default Spread	-0.001*** (-2.789)	-0.000 (-0.293)	-0.001*** (-2.935)	0.000 (0.343)	-0.001** (-2.033)	-0.000 (-0.736)
Federal Funds Rate	0.001 (0.236)	-0.000 (-1.067)	0.001 (0.258)	-0.000 (-0.122)	0.002 (0.339)	-0.000 (-1.453)
MOVE	-0.024*** (-6.905)	-0.018*** (-8.838)	-0.023*** (-6.591)	-0.012*** (-6.122)	-0.034*** (-6.751)	-0.030*** (-9.189)
Term Spread	-0.000 (-0.905)	-0.000*** (-2.710)	-0.000 (-0.947)	-0.000*** (-3.259)	-0.000 (-0.539)	-0.000 (-1.637)
GABI	0.135*** (6.328)	0.363*** (24.837)	0.221*** (10.161)	0.406*** (30.503)	-0.019 (-0.622)	0.335*** (14.532)
Cluster Business Impact	-0.000 (-1.160)	0.000 (0.161)	-0.000 (-0.338)	0.000 (1.082)	-0.001** (-2.246)	0.000 (0.205)
Cluster Environmental Impact	0.000 (0.354)	0.000 (0.124)	0.000 (0.478)	0.000 (1.136)	0.000 (0.189)	-0.000 (-0.314)
Cluster Societal Debate	0.000 (0.011)	-0.000 (-1.449)	-0.000 (-0.038)	-0.000 (-0.273)	0.000 (0.046)	0.000 (0.432)
Cluster Research	0.000 (0.471)	0.363*** (24.837)	0.000 (0.181)	-0.000** (-2.181)	0.000 (1.093)	-0.000 (-1.113)
<i>N</i>	738	1678	738	1678	738	1678
<i>r</i> ²	0.148	0.321	0.214	0.396	0.077	0.169

Appendix.

Table A1. Correlation

This table reports the pairwise correlations of the main variables included in the analysis.¹⁶

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) GCI Aggregate	1.000										
(2) CEMBI Aggregate	0.683	1.000									
(3) Default Spread	0.035	0.016	1.000								
(4) Federal Funds Rate	0.028	0.032	-0.406	1.000							
(5) MOVE	-0.229	-0.246	-0.038	0.009	1.000						
(6) Term Spread	-0.068	-0.067	0.210	-0.712	-0.007	1.000					
(7) GABI	0.707	0.464	0.042	0.028	-0.135	-0.060	1.000				
(8) Business Impact	-0.000	-0.027	-0.205	0.105	0.025	-0.189	-0.022	1.000			
(9) Environmental Impact	0.006	-0.013	-0.274	0.163	-0.013	-0.288	-0.015	0.596	1.000		
(10) Societal Debate	-0.015	-0.021	-0.251	0.219	0.012	-0.344	-0.029	0.751	0.656	1.000	
(11) Research	-0.024	-0.034	-0.200	0.085	-0.002	-0.132	-0.034	0.653	0.751	0.650	1.000

¹⁶ Due to space limitations we do not report here the correlations for the industry-specific and maturity-specific sub-indices.

Table A2. Global corporate bond market - Industry analysis (before the Paris Agreement)

This table reports the estimation results for global corporate bond market from Equation (2) in the period before the Paris Agreement (31 December, 2012 – 11 December, 2015) where the dependent variable is industry-specific daily return on GCI industry sub-indices. There are 14 different industry sub-indices represented in Columns (1-14). ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GCI Automotive	GCI Banks	GCI Basic Industries	GCI Cable/Media	GCI Capital Goods	GCI Consumer	GCI Energy
Default Spread	-0.000 (-1.292)	-0.000 (-1.230)	-0.001*** (-3.153)	-0.001** (-2.049)	-0.000* (-1.811)	-0.001* (-1.699)	-0.001*** (-2.794)
Federal Funds Rate	-0.006** (-2.105)	-0.005* (-1.815)	-0.009** (-1.995)	-0.011** (-2.238)	-0.010** (-2.435)	-0.010** (-2.075)	-0.016*** (-3.004)
MOVE	-0.024*** (-10.348)	-0.026*** (-9.887)	-0.043*** (-10.494)	-0.045*** (-10.306)	-0.036*** (-9.927)	-0.040*** (-9.516)	-0.050*** (-11.214)
Term Spread	-0.001*** (-3.107)	-0.001*** (-2.655)	-0.001*** (-2.827)	-0.001*** (-2.726)	-0.001*** (-3.163)	-0.001*** (-3.108)	-0.001*** (-3.610)
Cluster Business Impact	0.000 (0.465)	0.000 (0.343)	-0.000 (-0.550)	0.000 (0.438)	0.000 (0.171)	-0.000 (-0.057)	-0.000 (-0.866)
Cluster Environmental Impact	0.000 (1.318)	0.000* (1.869)	0.001* (1.864)	0.001* (1.927)	0.001** (2.147)	0.001* (1.850)	0.001** (2.334)
Cluster Societal Debate	-0.000 (-0.639)	-0.000 (-0.313)	-0.000 (-1.221)	-0.000 (-0.183)	-0.000 (-0.019)	0.000 (0.579)	-0.000 (-0.255)
Cluster Research	-0.000 (-0.717)	-0.000 (-1.063)	-0.000 (-1.013)	-0.001** (-2.140)	-0.000* (-1.709)	-0.001* (-1.752)	-0.001 (-1.588)
<i>N</i>	738	738	738	738	738	738	738
<i>r</i> ²	0.138	0.128	0.162	0.144	0.136	0.125	0.178

	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	GCI Non-Bank Financials	GCI Pharma/ Healthcare	GCI Real Estate	GCI Technology	GCI Transportation	GCI Telecom	GCI Utilities
Default Spread	-0.001*	-0.001*	-0.000	-0.000*	-0.001**	-0.001*	-0.001**
	(-1.889)	(-1.678)	(-1.449)	(-1.720)	(-2.083)	(-1.955)	(-2.256)
Federal Funds Rate	-0.009**	-0.010*	-0.009**	-0.008*	-0.011**	-0.011**	-0.014**
	(-1.966)	(-1.894)	(-2.302)	(-1.939)	(-1.972)	(-2.205)	(-2.102)
MOVE	-0.033***	-0.042***	-0.035***	-0.036***	-0.041***	-0.046***	-0.048***
	(-8.486)	(-8.900)	(-10.397)	(-9.404)	(-8.590)	(-10.551)	(-8.523)
Term Spread	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.002***
	(-3.152)	(-2.836)	(-3.156)	(-2.870)	(-3.036)	(-2.984)	(-3.250)
Cluster Business Impact	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.484)	(0.103)	(0.250)	(0.496)	(0.114)	(0.034)	(0.669)
Cluster Environmental Impact	0.000	0.001**	0.000	0.001**	0.001	0.001*	0.001*
	(1.591)	(2.023)	(1.503)	(2.362)	(1.626)	(1.713)	(1.782)
Cluster Societal Debate	-0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(-0.068)	(0.656)	(0.475)	(0.261)	(0.669)	(0.142)	(0.464)
Cluster Research	-0.000	-0.001*	-0.000	-0.001**	-0.001	-0.001	-0.001*
	(-1.170)	(-1.852)	(-1.242)	(-2.131)	(-1.570)	(-1.438)	(-1.690)
<i>N</i>	738	738	738	738	738	738	738
<i>r</i> ²	0.104	0.112	0.141	0.124	0.108	0.146	0.109

Table A3. Global corporate bond market - Industry analysis (after the Paris Agreement)

This table reports the estimation results for global corporate bond market from Equation (2) in the period after the Paris Agreement (12 December, 2015 – 31 August, 2022) where the dependent variable is industry-specific daily return on GCI industry sub-indices. There are 14 different industry sub-indices represented in Columns (1-14). ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GCI Automotive	GCI Banks	GCI Basic Industries	GCI Cable/Media	GCI Capital Goods	GCI Consumer	GCI Energy
Default Spread	-0.000 (-0.553)	0.000* (1.756)	0.000** (2.293)	0.000* (1.743)	0.000 (0.874)	0.000 (1.237)	0.000 (0.134)
Federal Funds Rate	-0.000** (-2.530)	-0.000 (-0.490)	-0.000 (-1.269)	-0.000 (-0.248)	-0.000 (-1.315)	-0.000 (-1.001)	-0.000* (-1.834)
MOVE	-0.018*** (-7.450)	-0.020*** (-8.234)	-0.030*** (-9.555)	-0.044*** (-11.176)	-0.020*** (-6.254)	-0.024*** (-6.724)	-0.050*** (-10.873)
Term Spread	-0.001*** (-4.932)	-0.000*** (-3.899)	-0.001*** (-3.868)	-0.001*** (-3.182)	-0.001*** (-4.364)	-0.001*** (-4.185)	-0.001*** (-2.809)
Cluster Business Impact	0.000* (1.843)	0.000** (2.130)	0.001** (2.319)	0.001** (2.164)	0.001** (2.152)	0.001** (2.200)	0.001* (1.883)
Cluster Environmental Impact	0.000 (1.146)	0.000 (0.575)	0.000 (0.733)	0.000 (0.611)	0.000 (1.142)	0.000 (0.954)	0.000 (0.446)
Cluster Societal Debate	-0.000* (-1.724)	-0.000 (-1.405)	-0.000* (-1.841)	-0.000 (-1.473)	-0.000* (-1.726)	-0.000* (-1.781)	-0.001* (-1.876)
Cluster Research	-0.000* (-1.731)	-0.000 (-1.465)	-0.000* (-1.680)	-0.000 (-1.373)	-0.000 (-1.579)	-0.000* (-1.654)	-0.000 (-0.696)
<i>N</i>	1678	1678	1678	1678	1678	1678	1678
<i>r</i> ²	0.050	0.058	0.073	0.084	0.042	0.046	0.073

	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	GCI Non-Bank Financials	GCI Pharma/ Healthcare	GCI Real Estate	GCI Technology	GCI Transportation	GCI Telecom	GCI Utilities
Default Spread	0.000	0.000	0.000	0.000**	0.000	0.000*	0.000
	(0.711)	(1.366)	(0.831)	(1.968)	(0.279)	(1.927)	(1.095)
Federal Funds Rate	-0.000	-0.000	0.000	-0.000	-0.000	-0.000	-0.000
	(-1.134)	(-0.691)	(0.008)	(-0.256)	(-1.364)	(-0.266)	(-0.730)
MOVE	-0.020***	-0.028***	-0.014***	-0.023***	-0.017***	-0.040***	-0.024***
	(-6.480)	(-7.173)	(-4.472)	(-6.367)	(-4.570)	(-9.664)	(-5.509)
Term Spread	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-4.443)	(-3.906)	(-3.951)	(-3.402)	(-4.039)	(-3.356)	(-3.771)
Cluster Business Impact	0.000*	0.001**	0.000	0.001**	0.000	0.001**	0.001**
	(1.935)	(2.218)	(1.450)	(2.216)	(1.629)	(2.389)	(2.078)
Cluster Environmental Impact	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.919)	(0.548)	(0.076)	(0.774)	(1.113)	(0.538)	(0.928)
Cluster Societal Debate	-0.000*	-0.000*	-0.000	-0.000	-0.000	-0.001*	-0.001**
	(-1.710)	(-1.706)	(-0.723)	(-1.501)	(-1.429)	(-1.814)	(-2.056)
Cluster Research	-0.000	-0.000	-0.001**	-0.000	-0.000	-0.000	-0.000
	(-1.493)	(-1.480)	(-2.207)	(-1.594)	(-1.591)	(-1.050)	(-1.217)
<i>N</i>	1678	1678	1678	1678	1678	1678	1678
<i>r</i> ²	0.044	0.048	0.035	0.042	0.028	0.070	0.035

Table A4. Global corporate bond market - Maturity analysis (before the Paris Agreement)

This table reports the estimation results for global corporate bond market from Equation (3) in the period before the Paris Agreement (31 December, 2012 – 11 December, 2015) where the dependent variable is maturity-specific daily return on GCI maturity buckets sub-indices. Columns (1-3) show the results for GCI IG in short, medium, and long term, respectively. Columns (4-6) report the results for GCI HY in short, medium, and long term, respectively. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	GCI IG 1-3	GCI IG 7-10	GCI IG 20-30	GCI HY 1-3	GCI HY 7-10	GCI HY 20-30
Default Spread	-0.000	-0.001*	-0.002*	-0.000	-0.001	-0.002***
	(-0.251)	(-1.796)	(-1.917)	(-0.574)	(-1.627)	(-4.786)
Federal Funds Rate	-0.002**	-0.014**	-0.020*	-0.002	-0.008	-0.011*
	(-2.430)	(-2.348)	(-1.660)	(-0.678)	(-1.374)	(-1.846)
MOVE	-0.006***	-0.052***	-0.085***	-0.016***	-0.036***	-0.032***
	(-7.462)	(-10.117)	(-7.965)	(-7.017)	(-7.022)	(-6.025)
Term Spread	-0.000***	-0.001***	-0.002**	-0.000	-0.001*	-0.002***
	(-2.915)	(-3.346)	(-2.388)	(-1.030)	(-1.892)	(-3.757)
Cluster Business Impact	-0.000	0.000	0.000	-0.000	-0.000	0.000
	(-0.621)	(0.392)	(0.452)	(-1.193)	(-0.951)	(0.835)
Cluster Environmental Impact	0.000*	0.001**	0.001*	0.000	0.000	0.001
	(1.648)	(2.095)	(1.716)	(0.691)	(0.746)	(1.402)
Cluster Societal Debate	-0.000	0.000	0.000	-0.000	-0.000	-0.001**
	(-0.313)	(0.115)	(0.444)	(-1.117)	(-0.232)	(-2.288)
Cluster Research	0.000	-0.001	-0.002*	0.000	-0.000	-0.000
	(0.273)	(-1.583)	(-1.858)	(0.035)	(-0.967)	(-1.087)
<i>N</i>	738	738	738	738	738	738
<i>r</i> ²	0.086	0.139	0.093	0.076	0.080	0.105

Table A5. Global corporate bond market - Maturity analysis (after the Paris Agreement)

This table reports the estimation results for global corporate bond market from Equation (3) in the period after the Paris Agreement (12 December, 2015 – 31 August, 2022) where the dependent variable is maturity-specific daily return on GCI maturity buckets sub-indices. Columns (1-3) show the results for GCI IG in short, medium, and long term, respectively. Columns (4-6) report the results for GCI HY in short, medium, and long term, respectively. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	GCI IG 1-3	GCI IG 7-10	GCI IG 20-30	GCI HY 1-3	GCI HY 7-10	GCI HY 20-30
Default Spread	0.000	0.000	0.000	0.000	0.000	0.000
	(1.461)	(1.339)	(1.048)	(1.272)	(1.592)	(1.524)
Federal Funds Rate	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000*
	(-0.125)	(-0.721)	(-0.765)	(-0.123)	(-0.908)	(-1.759)
MOVE	-0.003***	-0.021***	-0.045***	-0.028***	-0.068***	-0.076***
	(-3.621)	(-5.804)	(-5.979)	(-10.288)	(-14.832)	(-13.321)
Term Spread	-0.000***	-0.001***	-0.001***	-0.000	-0.001**	-0.001**
	(-4.171)	(-4.223)	(-3.394)	(-1.404)	(-2.549)	(-2.559)
Cluster Business Impact	0.000*	0.001**	0.001**	0.000	0.001**	0.001
	(1.736)	(2.195)	(2.102)	(1.270)	(2.256)	(1.394)
Cluster Environmental Impact	0.000	0.000	0.000	-0.000	0.000	-0.000
	(0.277)	(1.185)	(0.862)	(-0.419)	(0.115)	(-0.376)
Cluster Societal Debate	-0.000	-0.001*	-0.001	-0.000	-0.001*	-0.001
	(-1.475)	(-1.951)	(-1.597)	(-0.068)	(-1.656)	(-1.559)
Cluster Research	-0.000	-0.001*	-0.001	-0.000*	-0.000	0.000
	(-1.144)	(-1.845)	(-1.416)	(-1.680)	(-0.445)	(0.204)
<i>N</i>	1678	1678	1678	1678	1678	1678
<i>r</i> ²	0.030	0.042	0.035	0.066	0.126	0.106

Table A6. Emerging corporate bond market - Industry analysis (before the Paris Agreement)

This table reports the estimation results for emerging corporate bond market from Equation (2) in the period before the Paris Agreement (31 December, 2012 – 11 December, 2015), where the dependent variable is industry-specific daily return on CEMBI industry sub-indices. There are 14 different industry sub-indices represented in Columns (1-14). CEMBI Utilities has no observations before the Paris Agreement. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	CEMBI Automotive	CEMBI Banks	CEMBI Basic Industries	CEMBI Cable/Media	CEMBI Capital Goods	CEMBI Consumer	CEMBI Energy
Default Spread	-0.000 (-1.031)	-0.000** (-2.159)	-0.001*** (-2.815)	-0.001** (-2.547)	-0.001** (-2.292)	-0.001** (-2.290)	-0.001** (-2.110)
Federal Funds Rate	-0.009** (-2.352)	0.003 (0.777)	-0.000 (-0.062)	-0.007 (-1.231)	0.001 (0.193)	0.004 (1.005)	-0.004 (-0.589)
MOVE	-0.011*** (-3.208)	-0.017*** (-5.529)	-0.038*** (-7.175)	-0.029*** (-5.950)	-0.020*** (-6.225)	-0.018*** (-4.690)	-0.037*** (-6.551)
Term Spread	-0.001*** (-2.638)	-0.000 (-0.383)	-0.000 (-0.762)	-0.001** (-1.986)	-0.000 (-0.284)	-0.000 (-0.404)	-0.001 (-1.190)
GABI	0.084*** (4.021)	0.102*** (5.219)	0.161*** (4.848)	0.135*** (4.483)	0.119*** (5.995)	0.142*** (5.985)	0.104*** (2.920)
Cluster Business Impact	0.000 (0.684)	-0.000 (-1.088)	-0.001* (-1.660)	-0.000 (-0.332)	-0.000 (-0.129)	-0.000 (-1.516)	-0.000 (-0.878)
Cluster Environmental Impact	-0.000 (-0.012)	0.000 (0.450)	0.000 (0.322)	-0.000 (-0.420)	0.000 (0.015)	0.000 (0.024)	0.000 (1.027)
Cluster Societal Debate	-0.000* (-1.911)	0.000 (0.531)	-0.000 (-0.171)	0.000 (0.159)	-0.000 (-1.442)	0.000 (0.865)	-0.000 (-0.297)
Cluster Research	0.000 (0.713)	0.000 (0.501)	0.000 (0.391)	-0.000 (-0.513)	0.000 (0.846)	-0.000 (-0.104)	0.000 (0.189)
<i>N</i>	738	738	738	738	738	738	738
<i>r</i> ²	0.064	0.101	0.136	0.107	0.130	0.104	0.092

	(8)	(9)	(10)	(11)	(12)	(13)
	CEMBI Non-Bank Financials	CEMBI Pharma/Healthcare	CEMBI Real Estate	CEMBI Technology	CEMBI Telecom	CEMBI Transportation
Default Spread	-0.001** (-2.548)	-0.001** (-2.253)	-0.000 (-0.988)	-0.001*** (-2.615)	-0.001*** (-3.154)	-0.001*** (-3.320)
Federal Funds Rate	0.002 (0.660)	0.003 (0.459)	0.000 (0.020)	0.002 (0.477)	0.001 (0.210)	0.007 (1.051)
MOVE	-0.006** (-2.019)	-0.016*** (-3.057)	-0.020*** (-4.221)	-0.000 (-0.060)	-0.032*** (-7.796)	-0.028*** (-5.049)
Term Spread	-0.000 (-0.866)	-0.000 (-1.143)	-0.000 (-0.196)	-0.000 (-1.109)	-0.000 (-1.134)	-0.000 (-0.732)
GABI	0.096*** (4.937)	0.649*** (20.089)	0.165*** (5.610)	0.081*** (3.171)	0.135*** (5.301)	0.113*** (3.252)
Cluster Business Impact	-0.000 (-0.592)	-0.000 (-0.418)	-0.000 (-0.108)	0.000 (0.232)	-0.000* (-1.731)	-0.001* (-1.697)
Cluster Environmental Impact	-0.000 (-0.436)	-0.000 (-1.138)	-0.000 (-0.274)	-0.000 (-0.344)	0.000 (0.583)	-0.000 (-0.133)
Cluster Societal Debate	-0.000 (-1.483)	0.000 (0.061)	0.000 (0.659)	0.000 (1.117)	-0.000 (-0.274)	0.000 (0.339)
Cluster Research	0.000 (1.122)	0.000 (0.708)	-0.000 (-0.259)	-0.000 (-1.189)	0.000 (0.412)	0.001 (1.476)
<i>N</i>	738	738	738	738	738	738
<i>r</i> ²	0.064	0.394	0.082	0.029	0.156	0.080

Table A7. Emerging corporate bond market - Industry analysis (after the Paris Agreement)

This table reports the estimation results for emerging corporate bond market from Equation (2) in the period after the Paris Agreement (12 December, 2015 – 31 August, 2022) where the dependent variable is industry-specific daily return on CEMBI industry sub-indices. There are 14 different industry sub-indices represented in Columns (1-14). CEMBI Utilities has shorter time of data availability (564 observations) and there are no observations before the Paris Agreement. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	CEMBI Automotive	CEMBI Banks	CEMBI Basic Industries	CEMBI Cable/Media	CEMBI Capital Goods	CEMBI Consumer	CEMBI Energy
Default Spread	-0.000 (-1.338)	-0.000 (-0.396)	0.000 (0.634)	0.000 (1.199)	-0.000 (-0.892)	-0.000 (-0.377)	0.000 (0.035)
Federal Funds Rate	-0.000 (-1.607)	-0.000 (-0.490)	-0.000 (-1.049)	0.000 (0.214)	-0.000 (-1.563)	-0.000 (-1.306)	-0.000 (-0.290)
MOVE	0.005*** (2.686)	-0.009*** (-6.390)	-0.031*** (-8.366)	-0.040*** (-9.717)	-0.007*** (-4.274)	-0.014*** (-5.089)	-0.044*** (-10.343)
Term Spread	-0.000*** (-2.771)	-0.000*** (-2.733)	-0.000** (-2.076)	-0.000 (-0.683)	-0.000*** (-3.214)	-0.000*** (-3.388)	-0.000 (-0.867)
GABI	0.299*** (22.916)	0.223*** (21.507)	0.372*** (14.364)	0.615*** (21.353)	0.336*** (28.605)	0.414*** (20.832)	0.560*** (18.410)
Cluster Business Impact	-0.000 (-0.076)	0.000 (0.432)	0.000 (0.909)	0.000 (1.078)	0.000 (0.301)	0.000 (0.538)	-0.000 (-0.024)
Cluster Environmental Impact	0.000* (1.806)	-0.000 (-0.241)	0.000 (0.454)	0.000 (0.309)	-0.000 (-0.300)	-0.000 (-0.932)	0.000 (0.662)
Cluster Societal Debate	-0.000 (-1.379)	0.000 (0.884)	-0.000 (-0.354)	-0.000 (-0.794)	-0.000 (-0.383)	0.000 (0.142)	0.000 (0.961)
Cluster Research	-0.000 (-0.514)	-0.000 (-1.327)	-0.000 (-1.529)	-0.000 (-0.632)	-0.000 (-0.124)	-0.000 (-0.682)	-0.001* (-1.888)
<i>N</i>	1678	1678	1678	1678	1678	1678	1678
<i>r</i> ²	0.251	0.257	0.165	0.272	0.355	0.241	0.233

	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	CEMBI Non-Bank Financials	CEMBI Pharma/Healthcare	CEMBI Real Estate	CEMBI Technology	CEMBI Telecom	CEMBI Transportation	CEMBI Utilities
Default Spread	-0.000 (-1.324)	0.000 (0.223)	0.000 (0.179)	-0.000 (-0.696)	-0.000 (-0.218)	-0.000*** (-2.741)	-0.000 (-0.345)
Federal Funds Rate	-0.000 (-0.683)	-0.000 (-0.939)	0.000 (0.117)	-0.000 (-0.599)	-0.000* (-1.905)	-0.000* (-1.800)	-0.001*** (-2.692)
MOVE	-0.002 (-1.463)	-0.049*** (-7.748)	-0.006** (-1.968)	-0.011*** (-5.260)	-0.019*** (-7.497)	-0.009*** (-3.000)	-0.004 (-0.789)
Term Spread	-0.000** (-2.476)	-0.000 (-0.879)	-0.000** (-2.004)	-0.000** (-2.036)	-0.000*** (-2.795)	-0.000** (-2.069)	-0.001*** (-3.208)
GABI	0.354*** (33.608)	0.493*** (11.034)	0.332*** (15.265)	0.420*** (27.317)	0.418*** (23.676)	0.370*** (18.345)	0.199*** (4.779)
Cluster Business Impact	0.000 (0.658)	0.000 (0.097)	0.000 (0.079)	0.000 (0.709)	0.000 (0.387)	0.000 (0.070)	0.000 (0.911)
Cluster Environmental Impact	0.000 (0.751)	0.000 (0.127)	-0.000 (-0.442)	-0.000 (-0.499)	0.000 (0.459)	-0.000 (-0.371)	0.000 (1.046)
Cluster Societal Debate	-0.000 (-1.341)	-0.000 (-0.422)	0.000 (1.090)	-0.000 (-0.737)	0.000 (0.156)	-0.000 (-0.397)	-0.000 (-0.009)
Cluster Research	0.000 (0.060)	-0.000 (-0.333)	-0.000 (-1.490)	0.000 (0.212)	-0.000 (-1.110)	-0.000 (-0.186)	-0.001** (-2.332)
<i>N</i>	1678	1678	1678	1678	1678	1678	564
<i>r</i> ²	0.419	0.112	0.141	0.336	0.295	0.184	0.106

Table A8. Emerging corporate bond market - Maturity analysis (before the Paris Agreement)

This table reports the estimation results for emerging corporate bond market from Equation (3) in the period before the Paris Agreement (31 December, 2012 – 11 December, 2015), where the dependent variable is maturity-specific daily return on CEMBI maturity buckets sub-indices. Columns (1-3) show the results for CEMBI IG in short, medium, and long term, respectively. Columns (4-6) report the results for CEMBI HY in short, medium, and long term, respectively. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	CEMBI IG 1-3	CEMBI IG 7-10	CEMBI IG 10+	CEMBI HY 1-3	CEMBI HY 7-10	CEMBI HY 10+
Default Spread	-0.000 (-1.234)	-0.001*** (-2.948)	-0.002*** (-3.795)	-0.000 (-1.176)	-0.001** (-2.379)	-0.001* (-1.852)
Federal Funds Rate	0.001 (0.408)	0.002 (0.308)	0.000 (0.062)	0.007 (1.440)	0.000 (0.034)	0.005 (0.747)
MOVE	-0.005*** (-3.463)	-0.027*** (-5.839)	-0.050*** (-8.118)	-0.021*** (-4.854)	-0.043*** (-6.854)	-0.036*** (-6.495)
Term Spread	-0.000 (-0.202)	-0.000 (-1.103)	-0.001 (-1.099)	-0.000 (-0.021)	-0.000 (-0.951)	0.000 (0.039)
GABI	0.032*** (3.907)	0.280*** (9.597)	0.503*** (13.244)	-0.024 (-0.906)	0.008 (0.214)	0.024 (0.693)
Cluster Business Impact	-0.000* (-1.817)	0.000 (0.154)	0.000 (0.075)	-0.001** (-2.108)	-0.001** (-2.096)	-0.000 (-1.156)
Cluster Environmental Impact	0.000 (0.447)	0.000 (0.566)	0.000 (0.501)	0.000 (1.237)	0.000 (0.077)	0.000 (0.098)
Cluster Societal Debate	0.000 (0.437)	-0.000 (-0.191)	-0.000 (-0.076)	0.000 (0.231)	0.000 (0.208)	-0.000 (-1.168)
Cluster Research	0.000 (1.284)	-0.000 (-0.092)	-0.000 (-0.376)	0.000 (0.573)	0.000 (0.816)	0.001 (1.367)
<i>N</i>	738	738	738	738	738	738
<i>r</i> ²	0.057	0.190	0.309	0.047	0.082	0.076

Table A9. Emerging corporate bond market - Maturity analysis (after the Paris Agreement)

This table reports the estimation results for emerging corporate bond market from Equation (3) in the period after the Paris Agreement (12 December, 2015 – 31 August, 2022), where the dependent variable is maturity-specific daily return on CEMBI maturity buckets sub-indices. Columns (1-3) show the results for CEMBI IG in short, medium, and long term, respectively. Columns (4-6) report the results for CEMBI HY in short, medium, and long term, respectively. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	CEMBI IG 1-3	CEMBI IG 7-10	CEMBI IG 10+	CEMBI HY 1-3	CEMBI HY 7-10	CEMBI HY 10+
Default Spread	0.000 (0.843)	0.000 (0.097)	-0.000 (-0.111)	-0.000 (-1.255)	-0.000 (-0.075)	-0.000 (-0.486)
Federal Funds Rate	0.000 (1.152)	-0.000 (-0.532)	-0.000 (-0.826)	-0.000 (-1.394)	-0.000 (-1.416)	-0.000 (-1.054)
MOVE	-0.003* (-1.737)	-0.014*** (-6.430)	-0.027*** (-8.449)	-0.018*** (-6.463)	-0.043*** (-10.492)	-0.024*** (-9.357)
Term Spread	-0.000 (-1.290)	-0.000*** (-3.721)	-0.000*** (-3.055)	-0.000* (-1.775)	-0.000** (-2.069)	-0.000* (-1.900)
GABI	0.114*** (8.477)	0.543*** (34.941)	0.795*** (34.829)	0.201*** (10.129)	0.483*** (16.655)	0.288*** (15.542)
Cluster Business Impact	-0.000 (-0.175)	0.000 (1.628)	0.000* (1.875)	-0.000 (-0.218)	0.000 (0.522)	0.000 (0.242)
Cluster Environmental Impact	0.000 (1.304)	0.000 (1.336)	0.000 (0.395)	-0.000 (-0.688)	-0.000 (-0.355)	-0.000 (-0.231)
Cluster Societal Debate	0.000 (1.411)	-0.000 (-0.806)	-0.000* (-1.697)	0.000 (1.314)	-0.000 (-0.288)	0.000 (0.004)
Cluster Research	-0.000*** (-2.956)	-0.000** (-2.225)	-0.000 (-0.709)	-0.000* (-1.946)	-0.000 (-0.177)	-0.000 (-0.775)
<i>N</i>	1678	1678	1678	1678	1678	1678
<i>r</i> ²	0.061	0.459	0.461	0.096	0.211	0.186

