

# **Resilience of Environmental, Social, and Governance (ESG) Bonds Amidst the Russia-Ukraine Geopolitical Crisis**

## **Abstract**

This paper analyses the impact of the Russia-Ukraine war on the performance of Environmental, Social, and Governance (ESG) bonds compared to corporate bonds from 2021 to 2022. We find a significant interaction between the war and ESG bonds, with a coefficient of -0.270 on yield spreads ( $p < 0.1$ ), suggesting ESG bonds perform better during economic disruptions. This evidence offers valuable insights for investors, policymakers, and financial institutions on sustainable investment strategies during economic crises.

**JEL classification:** G14 G15 Q40

**Keywords:** Geopolitical Crisis, ESG bonds, Russia-Ukraine war, Sustainable Investments.

## **1. Introduction**

The U.S. has been a global leader in issuing ESG bonds since 2012, but market contraction caused by SEC regulatory uncertainties led to a \$28.6 billion decline in ESG debt issuance from 2022 to the following year (Gampher, 2023). These bonds, designed to support environmental, social, and governance initiatives, typically have lower credit risks and higher ratings than conventional bonds, making them more secure investment choices (Polbennikov et al., 2016).

In this paper, we examine the impact of the Russia-Ukraine conflict on the resilience and performance of ESG bonds. Boubaker et al. (2023) note that the war has spurred the adoption of renewable energy, boosting demand for ESG bonds that support such initiatives. Additionally, rising natural gas prices have led major energy firms like BP, Shell, and Rosneft to shift towards renewable solutions (Gillan et al., 2021). The geopolitical consequences have also prompted investors to reassess their ESG bond holdings, considering the geopolitical stances of involved nations (Hartzmark et al., 2019; Gillan et al., 2021). Our research aims to shed light on how international conflicts affect sustainable investments and the overall stability of global finance.

The conflict, beginning on February 24<sup>th</sup>, caused extensive displacements and a refugee crisis, primarily in Ukraine but also affecting Europe broadly. Our research offers multiple contributions: it explores the financial disruptions and economic impacts of the Russia-Ukraine war, focusing on the ESG bond market. It provides empirical evidence of ESG bonds' resilience during economic shocks and supports the price premium hypothesis by analysing yield spreads and performance during the war.

We find that despite the war's adverse effects, ESG bonds showed narrower credit spreads compared to conventional bonds, affirming their resilience and value during crises. This resilience enhances the appeal of sustainable investment strategies, especially under challenging conditions, and supports the growing recognition of ESG investments' protective qualities during market fluctuations (Boubaker et al., 2023).

The remainder of the paper is organized as follows. Section 2 presents the data, summary statistics, and methodology. Section 3 discusses the empirical results, and the robustness tests. Section 4 concludes the study.

## **2. Data and methodology**

For our study, we accessed U.S. corporate and ESG bond data from Thomson Reuters' Refinitiv fixed-income database. We compiled daily return data for 188 Moody's rated ESG bonds and 328 traditional bonds issued from January 1, 2020, to November 23, 2021, with maturities up to 2033. We analysed yields by subtracting returns of the 5-year U.S. Treasury bond from November 24, 2021, to May 24, 2022, to calculate yield differentials.

We utilized a Difference-in-Differences (DID) regression to compare conventional and ESG bond performance before and after the onset of the Russia-Ukraine war, focusing on the resilience of ESG bonds to this specific geopolitical event. Table 1 outlines the variables used in this analysis.

**Table 1**  
Variables descriptions.

Variable	Definition
Yield Spread	Difference in yields between a government bond and a corporate bond with the same maturity (In this regression, we use US 5-year Treasury bonds and bonds maturity between 2023 and 2033)
ESG	Dummy variable that equals one if, in the Thomson Reuter's Refinitiv database, the bonds are labeled as "ESG bonds."
Peacetime	Dummy variable that equals one from 24 November 2021 to 23 February 2022 and zero from 24 February 2022 to 24 May 2022.
Wartime	A dummy variable that equals one from 24 February 2022 to 24 May 2022 equals zero from 24 November 2021 to 23 February 2022,
Sector	Use the Refinitiv Business Classification (TRBC) as Thomson Reuter's Refinitiv Thomson Reuter's industry classification.
Seniority	Classified seniority of bonds Thomson Reuter's Refinitiv as senior secured, senior unsecured, and unsecured; senior secured value defined as 2, senior unsecured value defined 1, and unsecured as 0 in the regression.
Rating	Moody's bond credit ratings are from Aaa to C, with Aaa being the highest quality and C the lowest quality.
Amount Issued	The total amount of issued bonds.

Table 2 shows that ESG bonds have larger average issuance amounts and higher average Moody's ratings of 6.899 compared to 4.245 for conventional bonds, suggesting lower risk and greater creditworthiness. However, conventional bonds exhibit wider yield spreads from -32.036 to 34, indicating potentially higher yields but greater risk than the more stable ESG bonds.

**Table 2**  
Summary statistics.

	Bonds	Obs.	Mean	Median	SD	Min	Max
Moody's Issue	ESG	11900	6.899	6	3.024	0	13
	Conventional	15920	4.245	3	2.911	0	13
Seniority	ESG	11900	2.091	2	0.356	1	3
	Conventional	15920	2.194	2	0.415	1	3
Amount Outstanding (USD)	ESG	11900	$7.05 \times 10^8$	$5 \times 10^8$	$6.31 \times 10^8$	$1 \times 10^6$	$8 \times 10^9$
	Conventional	15920	$6.4 \times 10^8$	$5 \times 10^8$	$5.6 \times 10^8$	$1 \times 10^3$	$5.5 \times 10^9$
DID (War *ESG)	ESG	11900	0.492	0	0.500	0	1
	Conventional	15920	0	0	0	0	0
War	ESG	11900	0.492	0	0.500	0	1
	Conventional	15920	0.493	0	0.500	0	1
ESG Bond	ESG	11900	1	1	0	1	1
	Conventional	15920	0	0	0	0	0
Yield Spread	ESG	11900	1.202	1.081	1.050	-2.610	6.823
	Conventional	15920	2.645	2.170	3.128	-32.036	34.661

This table reports the summary statistics (number of observations, mean, median, standard deviation (SD), min, and max) for all variables.

The analysis examines yield spreads of 188 U.S. ESG and 328 traditional bonds issued from January 1, 2020, to November 23, 2021, calculating yield differences by subtracting the daily returns of the 5-year U.S. Treasury bond from November 24, 2021, to May 2022. Equation 1 assesses the influence of various factors on these spreads, incorporating ESG status as a dummy variable:

$$Yield\ Spread_{i,t} = \beta_0 + \beta_1 ESG_i + \beta_2 war_t + \beta_3 ESG_i \times war_t + \beta_4 Rating_i + \beta_5 Seniority_i + \beta_6 Amount\ Issued_i + \beta_7 Time\ FE_t + \beta_8 Issurer\ FE_i + \beta_9 TRBCSector\ FE_i + \epsilon_{i,t}, \quad (1)$$

Temporal variations are addressed using 'Peacetime' (from 24th November 2021 to 23<sup>rd</sup> February 2022) and 'Wartime' (from 24<sup>th</sup> February 2022 to 24<sup>th</sup> May 2022) dummy variables. Sector classifications are based on the Refinitiv Business Classification, and Moody's ratings assess creditworthiness. Bonds are categorized by seniority levels: unsecured, senior unsecured, and senior secured. The analysis uses two-way clustering by firm and year to reduce idiosyncratic effects and strengthen the results.

### **3. Empirical results and discussion**

#### *3.1. Main Results*

Our results indicate that while ESG and traditional bonds exhibited similar trends, traditional bonds consistently showed higher yield spreads, reflecting a "green premium" for ESG investments. Table 3, using a difference-in-differences (DID) regression, demonstrates how the Russia-Ukraine war negatively impacted ESG bonds across sectors, with a significant -0.270 coefficient for the wartime ESG interaction, highlighting ESG bonds' greater resilience compared to conventional bonds. This resilience may stem from a shift towards ESG bonds, especially in sectors susceptible to greenwashing, where firms may misrepresent their environmental efforts.

In contrast, conventional bonds became more attractive as entities aligned with Russia or supporting it did not meet ESG standards, thus, offering higher yields during the conflict. Detailed analysis revealed significant yield spread reductions in investment grade and financial sectors for ESG bonds, with coefficients of -0.238 and -0.422, respectively. The model's R<sup>2</sup> value of 80.6% shows its strong explanatory power, supporting the hypothesis that conventional bonds were less resilient, exhibiting wider yield spreads post-February 24<sup>th</sup>, 2022.

Cicchiello et al. (2022) affirm the financial viability of ESG bonds, which tend to generate higher profits even under similar risk conditions. However, the short-term market shock from the Russia-Ukraine war prompted a shift away from ESG bonds towards traditional investments amid heightened financial uncertainty (Reboredo & Ugolini, 2020).

**Table 3**

Difference in Difference Regression for Daily Corporate Credit Spread.

	Baseline	Key dates	Investment Grade	High Yield	Financial	Nonfinancial
DiD (War * ESG bond)	-0.270* (-1.740)	-0.269* (-1.720)	-0.238*** (-4.710)	-0.120 (-0.340)	-0.422*** (-4.880)	-0.198 (-0.940)
Amount Outstanding (USD)	0.000** (2.380)	0.000** (0.020)	0.000 (1.600)	0.000* (1.780)	0.000 (0.800)	0.000*** (3.760)
Moody's (Issue)	-1.187*** (-6.140)	-1.187** (-6.140)	-0.727*** (-22.420)	-1.101*** (-7.680)	0.000 (0.000)	-1.192*** (-6.540)
Seniority	-0.056** (8.310)	-0.056** (-2.150)	-0.023 (-1.500)	-0.170*** (-3.530)	-0.093*** (-9.060)	-0.046*** (-4.970)
War		0.000 (0.000)				
ESG Bond		-0.038 (-0.240)	0.053 (0.310)	-0.437** (-2.330)	0.040 (0.260)	0.000 (0.000)
constant	8.521*** (8.310)	8.537*** (8.310)	5.896*** (26.480)	6.748*** (11.260)	2.271*** (24.820)	8.104*** (8.830)
Observations	27820	27820	18783	9037	8450	19370
R <sup>2</sup>	0.806	0.806	0.608	0.710	0.936	0.775
IssuerName1	YES	YES	YES	YES	YES	YES
TRBCSector1	YES	YES	YES	YES	YES	YES
time	YES	YES	YES	YES	YES	YES

This table displays the results of a Difference-in-Difference regression analysing daily corporate credit spreads. The first column explores the relationship between yield spread and variables such as war\*ESG, amount outstanding in USD, Moody's issue, seniority, issuer, sector, and time. Subsequent columns break down the analysis by key dates of the Russia-Ukraine war, bond classifications by investment grade and high yield, and samples from financial and nonfinancial industries. Investment-grade bonds are noted for lower credit risk and higher ratings, while high-yield bonds carry higher credit risks. All variables are defined in Table 2, with \*, \*\*, and \*\*\* denoting significance at the 10%, 5%, and 1% levels, respectively.

### 3.2. Robustness

Table 4 details a robustness test using Propensity Score Matching (PSM) with 12,920 observations to minimize confounding biases. Due to data limitations and collinearity, seniority and other key dates variables were omitted. However, the War\*ESG interaction score of -0.158 suggests that ESG bonds' yield spreads were relatively resilient during the war.

Additionally, a significant negative p-value for Moody's rating confirms the stability of higher-rated bonds, and a significant result for the amount outstanding variable indicates a direct relationship between bond issuance volume and yield spread. These results support the hypothesis that ESG bonds are more resilient during conflicts, validating the paper's conclusions and highlighting ESG bonds as stable investments during geopolitical upheavals.

**Table 4**  
Robustness test based on the PSM.

	p Score
DID (war*ESG)	-0.158** (-2.150)
AmoutOutstandingUSD	0.000*** (2.830)
MoodysIssue	-1.405*** (-72.900)
constant	9.419*** (54.54)
Observations	12920
R <sup>2</sup>	0.947
IssuerName1	YES
TRBCSector1	YES
time	YES

This table replicates the tests from Table 4, column 1, but use a propensity score matched sample on bonds size (AmountOutstandingUSD) and Ratings. ESG equals one for bonds classified as “ESG Bond” and zero otherwise. War equals one during wartime, and zero otherwise. Standard errors are heteroscedasticity robust. All variables are defined in Table 2. The numbers in parenthesis are t statistics. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

#### 4. Conclusion

Since HSBC issued the first ESG bond in 2003, these bonds have become key components of international financial markets. This paper shows that despite the uncertainty caused by the Russia-Ukraine war, ESG bonds maintained more stable performances and lower default risk, with minor interest rate increases compared to conventional bonds. However, the conflict negatively impacted both ESG and conventional bonds, with conventional bonds showing less resilience to economic shocks. This is supported by our regression analysis, which indicates a significant -0.270 coefficient for the interaction between the war and ESG bonds on yield spreads ( $p < 0.1$ ), demonstrating that ESG bonds perform better during such crises. Future research should explore ESG bonds' role in post-conflict recovery and sustainability, expand to global markets, and utilize enhanced data sets for deeper insights.

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