PUEY UNGPHAKORN INSTITUTE
FOR ECONOMIC RESEARCH

Tax Incentives and the Cost of Sustainable Debt: Evidence from Thailand's ESG Fund Policy

by

Phanjarat Daengnimvikul and Kanis Saengchote

October 2025

Discussion Paper

No. 241

Tax Incentives and the Cost of Sustainable Debt: Evidence from Thailand's ESG Fund Policy

Phanjarat Daengnimvikul
Chulalongkorn Business School

Kanis Saengchote[1]
Chulalongkorn Business School

ABSTRACT

We evaluate the pricing impact of Thailand's Thai ESG Fund – a tax-incentivized retail program launched in 2023 Q4 – on the corporate bond market, separating primary-market issuance from secondary-market repricing. Using Thai corporate THB bonds issued from 2018 to 2024, we test two hypotheses. At issuance (H1), we compare ESG coupons with observationally similar non-ESG issues via propensity-score matching. The average pairwise coupon spread (ESG minus matched non-ESG) is -29 bps overall, -23 bps pre-policy, and -92 bps post-policy, yielding a post-pre difference of -69 bps (all statistically significant). In the secondary market (H2), we analyze seasoned bonds issued in or before 2023 Q3 and estimate a difference-in-differences regression with bond and quarter fixed effects, supplemented by an event study. The ESG×Post coefficient ranges from +31 to +42 bps, and event-time estimates show flat pre-trends with the ESG spread turning positive from two quarters and building to 49 bps by the fourth quarter. Together, the policy reduces funding costs for new ESG issues while raising required yields on older ESG bonds, consistent with demand concentrating in newly eligible, on-the-run ESG supply and a higher off-the-run liquidity premium.

Keywords: ESG bonds, tax-incentivized mutual funds, greenium, off-the-run premium, sustainable finance policy

---

[1] Chulalongkorn Business School, Chulalongkorn University (email: kanis@cbs.chula.ac.th).

1. Introduction

In December 2023, Thailand launched a national ESG Fund program, offering individual tax incentives to channel savings into domestic sustainable assets. The scheme requires ESG-focused portfolios and provides deductions against assessable income, creating a clear setting to study how targeted tax incentives affect the pricing of ESG debt in an emerging bond market.

This question matters because evidence on an "ESG yield spread" (greenium) is mixed and context-dependent. Some studies find lower financing costs for green/ESG bonds (e.g., Flammer, 2021; Zerbib, 2019), while others report little or no discount in certain markets or segments (Larcker & Watts, 2020; Löffler, Petreski, & Stephan, 2021). Mechanisms typically emphasize demand pressure and policy support. In Thailand, specifically, mutual-fund behavior has been shown to influence equity prices through flows and portfolio choices (Ratanabanchuen & Saengchote, 2020), and tax-privileged funds adjust their risk to focus on high-beta stocks in order to compete for fund flows (Ratanabanchuen & Saengchote, 2021). These findings suggest that tax-incentivized investor demand can reprice assets, raising the possibility of analogous effects in the bond market when ESG-focused tax incentives are introduced.

We evaluate the pricing effects of the Thei ESG Fund program on the domestic bond market by comparing ESG and matched non-ESG bonds before and after the policy. We separate primary-market issuance yields from secondary-market yield spreads to distinguish intended effects at issuance from spillovers to seasoned debt. Our results show that ESG corporate bonds are priced at lower coupons at issuance, with an average ESG spread of -29 bps relative to matched non-ESG bonds, which widens to -92 bps after the launch of Thailand's 2023Q4 ESG Fund. In contrast, among seasoned (pre-policy) bonds, ESG yields rise by 31 to 42 bps relative to non-ESG in a difference-in-differences design with bond and quarter fixed effects. An event study confirms flat pre-trends and a post-policy widening from two quarters after the policy, coinciding with the new supply of ESG bonds. The policy thus reduces funding costs for new ESG deals but raises required yields on older ESG paper, highlighting a design trade-off for sustainable-finance tax incentives.

Our contribution is twofold: we provide early evidence on the pricing impact of a tax-incentivized ESG program in emerging markets and demonstrate that effects can diverge across issuance and trading stages, with clear implications for policy design.

The rest of the paper is organized as follows. Section 2 outlines Thailand's ESG bond market and the ESG Fund policy, reviews the related literature, and states our research hypotheses. Section 3 describes the data and research design. Section 4 reports results, and Section 5 concludes.

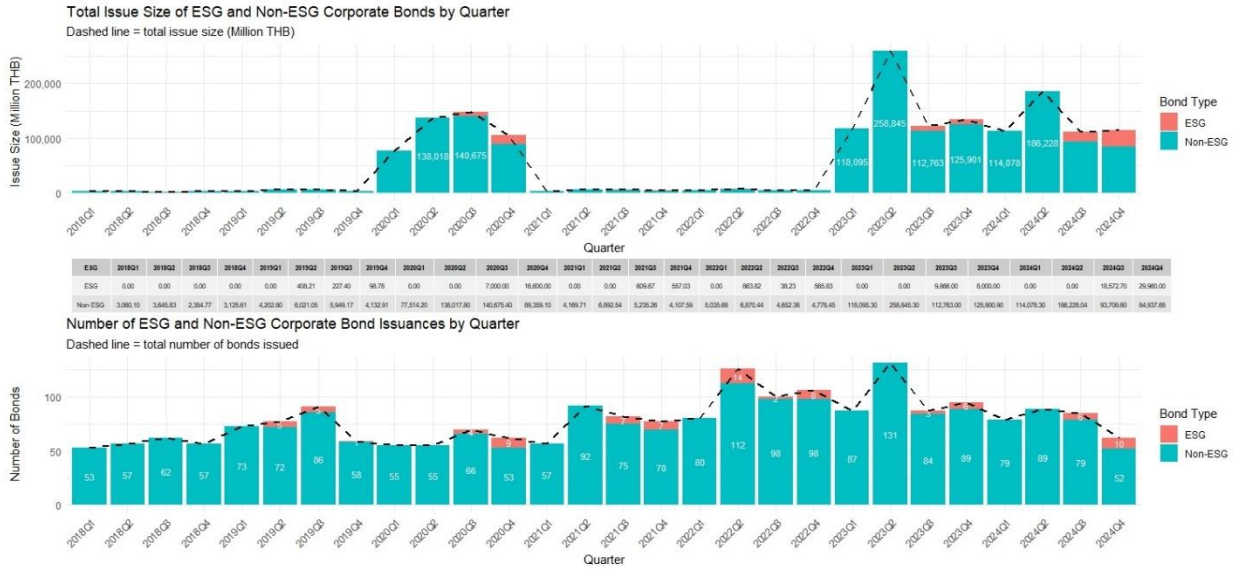
2. Institutional Background and Literature

2.1 Thailand's ESG bond market and the ESG Fund policy

Thailand's ESG bond market has expanded rapidly since 2019, with both government and corporate issuers active. Although corporate issuers outnumber government issuers, the public sector accounts for the largest share of issuance. Figure 1 charts quarterly corporate issuance (size and counts) from 2018 to 2024, with ESG shown as the red segment of each bar. Two patterns stand out. First, issuance is lumpy and seasonal – notably around year-end – consistent with flow timing in Thailand's tax-privileged fund ecosystem. Second, while ESG supply accounts for a small share by volume and count, it becomes more frequent and less sporadic from 2023 Q4 onward, coinciding with the launch of the Thai ESG Fund. This backdrop motivates our empirical split between primary and secondary mechanisms: a policy-induced demand shock at issuance (potentially lowering ESG coupons) alongside possible reallocation away from older ESG bonds in the secondary market.

Figure 1: Quarterly corporate bond issuance in Thailand, 2018-2024

Top panel: total issue size (million THB, dashed line) with stacked bars splitting ESG (red) and non-ESG (teal). Bottom panel: number of bonds issued per quarter (dashed line = total count), with the same ESG/non-ESG breakdown. The Thai ESG Fund policy commences in 2023 Q3.



On December 8, 2023, Thailand launched the Thai ESG Funds initiative, which comprises open-ended mutual funds that must invest primarily in domestic, sustainability-themed assets (equities or debt) and offer individual income-tax deductions of up to 30% of assessable income, capped at THB 300,000 for the 2023 tax year. The program is a joint effort of the Ministry of Finance, the Federation of Thai Capital Market Organizations (FETCO), the Securities and Exchange Commission (SEC), the Stock Exchange of Thailand (SET), and the Association of Investment Management Companies (AIMC), and was positioned as a policy lever to both promote savings and channel capital into sustainable assets.

The Thai market has prior experience with tax-privileged mutual funds that shape investor behavior, such as the Long-Term Equity Funds (LTFs) and the Retirement Mutual Funds (RMFs). These funds offer upfront tax benefits, subject to lock-ups and contribution limits, which creates strong seasonality around year-end and potentially alters managers' risk incentives toward higher-beta stocks. In Thailand, investors could historically deduct contributions (with lock-ups), and the top marginal rate (up to 35%) made benefits economically meaningful. Limits allowed deductions up to a sizable share of taxable income (e.g., 15% up to THB 500,000 across certain products in earlier regimes).

Taken together, the ESG Fund is a natural extension of Thailand's tax-privileged architecture to a sustainability-targeted mandate. This background motivates our empirical focus on how tax-incentivized demand translates into pricing effects for new versus seasoned ESG bonds.

2.2 Related Literature

A central question in sustainable finance is whether ESG (or "green") labels lower borrowing costs – the so-called greenium. In the corporate bond market, recent large-sample evidence reveals lower issuance yields for green bonds by 3 to 8 basis points (bps), consistent with investor demand lowering the cost of capital for issuers labeled as green (Caramichael & Rapp, 2024). In sovereign markets, estimates vary by setting; for German federal "twin" bonds, Koziol et al. (2022) report a greenium as high as 68-81 bps during the sample and methodology considered, while other work generally finds smaller differentials. Earlier papers also document green premia in global samples of labeled bonds, linking price differences to pro-environmental preferences and demand (Zerbib, 2019; Flammer, 2021). However, some studies report weak or no greenium, depending on the market segment and timing (Larcker & Watts, 2020).

A growing strand links flows and demand pressure directly to ESG pricing. Using institutional trades and a structural demand system, van der Beck (2023) shows that every $1

of flow toward ESG portfolios increases their aggregate market value by roughly $0.6-$0.7, with an annual flow-driven ESG return of 2.07% over 2017-2022, providing evidence that flows can materially move prices when substitution elasticities are low. Although van der Beck studies equities, the underlying mechanism (inelastic supply of "sustainable" exposure) is directly relevant for labeled fixed income when policy creates targeted demand. Complementing this mechanism, Thai micro-evidence shows that mutual-fund capital allocation affects prices: stocks more widely held by funds or receiving larger inflows tend to appreciate, and tax-privileged funds tilt toward higher-beta exposures when flows surge – both patterns consistent with flow-induced price pressure (Ratanabanchuen & Saengchote, 2020, 2021).

In sovereign markets, on-the-run securities (those newly issued) trade at lower yields than similarly aged off-the-run securities (those recently issued) because superior liquidity is associated with a valuation premium. The on-the-run versus off-the-run gaps are well-documented and time-varying (Krishnamurthy, 2002; Goldreich, Hanke, & Nath, 2005; Fontaine & Garcia, 2012). The preferred-habitat theory similarly predicts that inelastic, targeted demand can influence relative prices when arbitrage is limited (Vayanos & Vila, 2021). In corporate bonds, lower liquidity is priced as higher yields (Bao, Pan, & Wang, 2011; Dick-Nielsen, Feldhütter, & Lando, 2012). Applied to our setting, a tax-incentivized shift in fund demand toward newly issued ESG bonds can increase the liquidity premium required on older ESG bonds, implying higher secondary-market yields for seasoned ESG debt relative to comparable non-ESG debt, even if credit fundamentals remain unchanged.

We connect these research strands by evaluating a national fiscal policy shock that induces demand for ESG assets in an emerging bond market, and by distinguishing between primary (issuance pricing) and secondary (repricing of seasoned, off-the-run bonds) mechanisms.

2.3 Hypotheses

We study how Thailand's Thai ESG Fund (investable from 2023Q4) affects bond pricing through two complementary channels. In the primary market, policy-induced demand could lower coupons on new ESG issues at bookbuilding; in the secondary market, demand may concentrate on newly eligible (on-the-run) ESG supply, raising the liquidity premium required on older ESG paper. Formally:

H1: Primary-market effect

After 2023Q4, ESG corporate bonds are issued at lower coupons than comparable non-ESG bonds at issuance. We test H1 using propensity-score-matched pairs and report coupon differences in basis points (ESG minus matched non-ESG).

H2: Secondary-market effect

Among seasoned (pre-policy, off-the-run) bonds, ESG yields rise relative to non-ESG after 2023Q4. We test H2 in a difference-in-differences panel with bond and quarter fixed effects.

These hypotheses connect international evidence on a "greenium" at issue (e.g., Caramichael & Rapp, 2024; Zerbib, 2019) with liquidity and preferred-habitat mechanisms in secondary markets.

3. Data and Methodology

At issuance (H1), we compare ESG coupons to those of observationally similar non-ESG bonds using propensity-score matching with pre-issuance screens (industry, tenor) to ensure common support and interpretability in basis points. In the secondary market (H2), we analyze seasoned bonds issued ≤ 2023Q3 and estimate a difference-in-differences (DiD) with bond and quarter fixed effects to isolate the post-2023Q4 differential in ESG yields, supplemented by an event-study to assess parallel trends and dynamics. We report corporate bonds only (government ESG issues are too sparse), and all estimates are shown separately for issuance versus seasoned markets.

3.1 Data

We assemble a bond-level quarterly panel for Thailand, comprising data from ThaiBMA and Bloomberg, from 2018 to 2024, which includes issuance information, bond characteristics, and yield measures for both primary and secondary markets. Key variables include issue size, industry (BICS level 1), issuance and maturity dates, coupon, seniority, credit rating, secondary market yields, and issuer controls at issuance (ROA, D/E, total assets).

We classify as ESG any green, social, sustainability, or sustainability-linked bond issued in Thailand. We initially collect 5,061 bond issuances from Bloomberg (127 ESG, 4,934 non-ESG). After cleaning and restricting the observations to those with complete information, the final dataset contains 2,209 bonds: 87 ESG and 2,122 non-ESG. Because issuance practices

and investor clienteles differ, we report government and corporate results separately throughout this report.[1]

The Thai ESG Fund regime became investable in December 2023. We set Post = 1 for 2023 Q4 and onward. The primary-market sample comprises bonds with valid issuance coupons and covariates. The secondary-market sample comprises seasoned bonds issued on or before 2023 Q3 (hence, off-the-run by construction), so secondary results reflect the repricing of existing ESG debt rather than contemporaneous issuance dynamics.

ESG and conventional bonds can differ systematically in maturity, rating, size, industry, and pricing calendar. A raw comparison – or a regression that extrapolates beyond the overlap of observables – could confound the policy effect with composition. Propensity score matching (PSM) enables us to compare observationally similar issues, maintain inference on common support, and express the effect in basis-point coupon differences that are transparent to policymakers and practitioners. Matching is therefore our main tool at issuance (a cross-sectional pricing decision), while DiD is our tool in the secondary market (panel repricing over time). Matching equalizes observables; to mitigate remaining imbalances, we use tight design screens and calipers, and report balance diagnostics.

3.1 Primary Market Estimation

For each ESG issue, candidate controls are non-ESG bonds in the same industry with similar tenor at issue ($|\Delta\text{TTM}| \leq 1$ year); observations outside the common support of the propensity score are dropped. We estimate a logit for $P(ESG = 1 \mid X)$ using pre-issuance observables associated with pricing: maturity, seniority, log(issue size), rating buckets (corporates), issuer ROA, D/E, and total assets. Based on the propensity score, we select three matches. For each matched pair, we compute the pairwise coupon spread:

$$\Delta Coupon_{ij} \equiv Coupon_i^{ESG} - Coupon_j^{nonESG} \quad (1)$$

We summarize (i) the overall average of ΔCoupon across all pairs (ATT, in bps) and (ii) the same statistic pre-policy vs. post-policy using the same matches. Negative values indicate an ESG coupon discount, also known as a "greenium."

[1] Because there were only three government-issued ESG bonds during the period, we focus on corporate bonds. However, some Thai ESG funds emphasize government-issued ESG bonds, while some are more flexible.

3.2 Secondary Market Estimation

We build a quarterly panel for matched seasoned bonds issued ≤ 2023Q3 (off-the-run by construction). The dependent variable is the bond's yield.

$$Yield_{b,t} = \mu_b + \tau_t + \beta(ESG_b \times Post_t) + \gamma' X_{b,t} + \varepsilon_{b,t} \quad (2)$$

The model includes bond fixed effects. μ_b (or industry fixed effects) and quarter fixed effects τ_t. When appropriate, $X_{b,t}$includes log of issue size, bond seniority dummy, and issuer ROA, D/E and log of total assets (the inclusion of bond fixed effects negates the need for control variables). Standard errors are clustered at the bond level. H2 predicts $\beta > 0$ if demand reallocation toward newly eligible issues raises the off-the-run liquidity premium on older ESG bonds.

We also estimate an event study replacing $ESG \times Post$ with interactions $ESG \times \mathbf{1}\{t = k\}$ for relative quarters k for 4 quarters before and after the policy, setting 2023Q3 (k = −1) as the reference. Pre-policy coefficients near zero support parallel trends; positive post-policy coefficients indicate a widening ESG/non-ESG spread among seasoned bonds.

4. Results

We first describe the issuance sample and then document covariate balance in the matched sample that underpins the H1 test. The corporate issuance sample comprises 87 ESG and 2,122 non-ESG bonds issued between 2018 and 2024 (Table 1). ESG issues have lower average coupon rates (3.25% vs. 4.33%), larger average offer sizes (THB 1,073.2 million vs. THB 762.1 million), and a longer tenor at issue (6.14 years vs. 3.95 years). Seniority distributions are similar (both concentrated in senior unsecured). Issuer fundamentals are broadly comparable in terms of profitability, while ESG issuers are less leveraged and larger. These composition differences motivate our matching strategy to ensure that ESG and non-ESG issues are compared on a common basis at origination.

After propensity-score matching with pre-screens (industry and tenor), ESG and non-ESG bonds are more similar (Table 2). For example, the average coupons are closer (ESG 3.25% vs non-ESG 3.54%), but the difference is statistically significant. With balance established, we proceed to test H1 by computing within-match pair differences in coupons (ESG minus matched non-ESG) and then examining how these spreads behave overall and before and after the policy.

Table 1: Summary Statistics of Corporate Bond Issuances

This table presents the summary statistics for the corporate bond sample, separating ESG and non-ESG bonds. Coupon (%) is the bond's coupon rate at issuance, expressed as a percentage. Issue size (THB) refers to the bonds' issue size, reported in millions of Thai Baht. Seniority refers to the ranking of a bond in the priority of repayment in the event of issuer default or bankruptcy, ranking from Seniority = 1, Senior Unsecured = 2, Subordinated =3 and Unsecured = 4. Tenor at issue refers to the original maturity of a bond at the time it is issued. Time-to-Maturity refers to the remaining time until a bond reaches its maturity date. ROA, D/E and total assets (THB billion) are as of the time of issue.

Corporate Bonds	Obs.	Mean	Median	S.D.	25th	Median	99th
				ESG bonds			
Coupon (%)	87	3.25	3.15	0.84	2.62	3.15	5.00
Issue size (THB mn)	87	1,073.19	121.47	1,698.87	52.33	121.47	7,306.60
Seniority	87	1.95	2.00	0.26	2.00	2.00	2.14
Tenor at Issue (Yr)	87	6.14	5.00	3.37	3.00	5.00	15.00
ROA	87	0.01	0.01	0.01	0.01	0.01	0.03
D/E	87	1.41	1.33	0.76	0.98	1.33	3.00
Total Assets (THB bn)	87	829.09	651.50	1,078.32	380.77	651.50	3,095.60
				Non-ESG bonds			
Coupon (%)	2122	4.33	3.95	1.60	3.16	3.95	7.58
Issue size (THB mn)	2122	762.11	100.00	1,904.72	27.35	100.00	7,115.60
Seniority	2122	1.88	2.00	0.36	2.00	2.00	2.00
Tenor at Issue (Yr)	2122	3.95	3.00	2.87	2.00	3.00	15.00
ROA	2122	0.01	0.01	0.01	0.00	0.01	0.04
D/E	2122	1.94	1.47	1.53	0.93	1.47	6.86
Total Assets (THB bn)	2122	778.94	200.78	1,804.18	52.10	200.78	10,910.37

Table 2: Covariate Balance

This table presents covariate balance diagnostics for ESG and non-ESG government bonds following 1:3 propensity score matching. It reports the sample sizes, means, and standard deviations (S.D.) for both groups, along with the t-statistics, p-values, and standardized mean differences (SMD). Note: * Significant at the 10% level ($p < 0.10$), ** Significant at the 5% level ($p < 0.05$), *** Significant at the 1% level ($p < 0.01$)

Variable	Mean (ESG)	Mean (Non-ESG)	S.D. (ESG)	S.D. (Non-ESG)	t-stat	p-value	SMD
Coupon (%)	3.25	3.54	0.84	1.13	2.54	0.012**	-0.273
Issue size (THB m)	1,073.19	668.46	1,698.87	1,652.74	1.94	0.055*	0.243
Rating	4.839	4.031	3.403	3.08	1.96	0.052*	0.256
Seniority	1.954	1.989	0.26	0.164	1.16	0.248	-0.179
Time-to-Maturity	6.018	5.512	3.37	2.889	1.26	0.211	0.168
ROA	0.01	0.008	0.007	0.01	1.61	0.11	0.168
D/E	1.414	1.793	0.764	1.538	3.02	0.003***	-0.274
Total Assets (THB bn)	829.09	914.57	1,078.32	1,540.53	0.57	0.569	-0.059

4.1 ESG Issuance Spread

Table 3: Issuance coupon spreads for PSM-matched pairs.

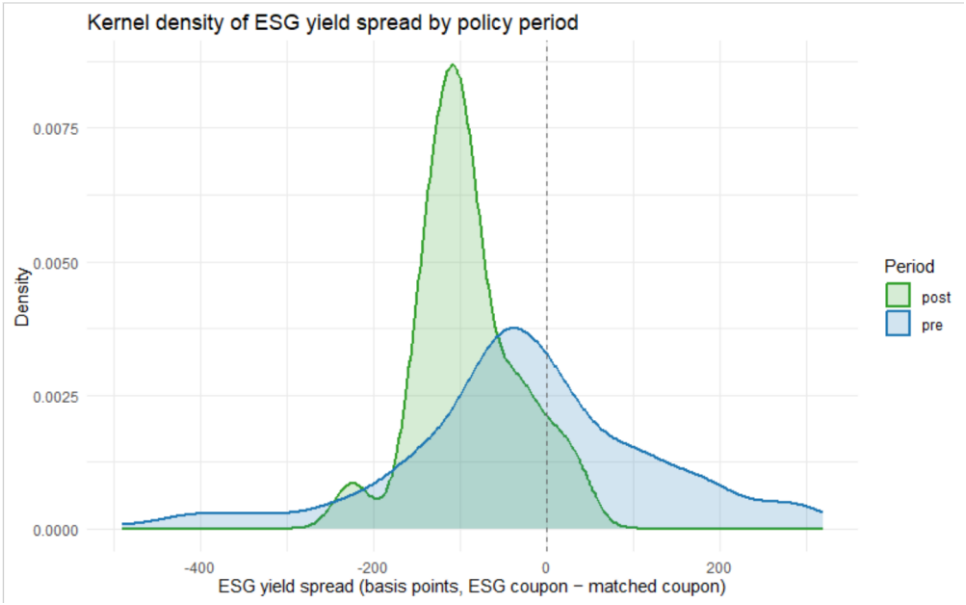
Means are reported for the full sample, pre-policy (≤ 2023Q3), and post-policy (≥ 2023Q4); "Difference" is Post minus Pre. Negative values indicate an ESG coupon discount. N is the number of ESG/non-ESG pairwise comparisons; t-statistics test whether the mean spread differs from zero (for "Difference," whether Post ≠ Pre).

	Mean (bps)	N	SD	t-stat
Overall	-29.08	261	141.29	3.32
Pre-policy	-23.30	239	145.29	2.48
Post-policy	-91.86	22	58.38	7.38
Difference	-68.57			4.40

Table 3 reports the ESG coupon spreads. Consistent with H1 (Primary-market effect), ESG corporate bonds are priced at lower coupons than comparable non-ESG bonds when comparing propensity-matched issues on the same support. Using pairwise coupon differences (ESG minus matched non-ESG) from PSM, the average spread is -29 bps overall (t = 3.32). Splitting the same matches by period, the spread is -23 bps pre-policy (t = 2.48) and widens to -92 bps post-policy (t = 7.38), with a post-pre difference of -69 bps (t = 4.40). These patterns align with international evidence that investor demand lowers the cost of labeled debt (Caramichael & Rapp, 2024; Zerbib, 2019) and suggest that the Thai ESG Fund intensified this effect at bookbuilding. Relative to prior Thai evidence, our pre-policy estimate is directionally consistent but somewhat larger than ThaiBMA's (2023) same-issuer/peer matches of -5.8 bps and the SEC's (2023) bottom-up matching of -3.5 to -1.9 bps. By employing stricter matching and exploiting the policy timing, our results both corroborate and extend this literature: the ESG "greenium" exists before the policy and becomes materially larger and more uniform afterward, as illustrated by Figure 2. The post-policy density shifts left and tightens, indicating a larger, more homogeneous coupon discount for ESG issues after 2023Q4.

Figure 2: Kernel densities of pairwise coupon spreads (pre- versus post-).

Negative values indicate an ESG coupon discount, also known as a "greenium." The post-policy distribution (green) shifts markedly left and tightens relative to the pre-policy distribution (blue), consistent with a larger and more homogeneous greenium following the policy; the dashed line marks zero. The number of matched bond issuances before the policy is 239, and after the policy is implemented, it is 22.



4.2 Off-the-Run ESG Spread

Next, we estimate a DiD regression with bond and quarter fixed effects and standard errors clustered at the bond level. The regression outputs in Table 4 show that the DiD coefficient on ESG×Post is positive and tightly estimated in all models with various combinations of fixed effects, ranging between 31.4 and 42.1 bps, all statistically significant at the 1% level. The positive coefficient suggests that, following the implementation of the Thai ESG Fund policy, the yields of seasoned (pre-policy/off-the-run) ESG corporate bonds rose relative to those of non-ESG corporate bonds. Our preferred specification is Model 3 (with both bond and quarter fixed effects to absorb all time-invariant bond quality and common macro shocks), and the estimated effect is 40.1 bps. With a median coupon rate of 3.15% and tenor of 5 years, a 40-bps widening implies a price decline of roughly 1.8%.

Table 4: DiD for seasoned bonds.

This table presents the difference-in-differences regression results assessing the impact of the Thai ESG Fund policy (effective from 2023Q4) on corporate bond yields. The dependent variable is the bond yield, and the key coefficient of interest is the interaction term (ESG × Post), which captures the policy's effect on the ESG yield spread. Models add fixed effects sequentially: (1) industry FE; (2) industry + year-quarter FE; (3) industry + year-quarter + bond (ISIN) FE. Controls are log(issue size), seniority dummies, ROA, D/E, log(total assets), and time-to-maturity. Standard errors are clustered at the bond level (ISIN). Note: Significant level: *** p < 0.01, ** p < 0.05, * p < 0.1

	Model 1	**Model 2**	**Model 3**
ESG Bond	-0.181*	-0.382***	
	(0.095)	(0.090)	
Post Policy (Q≥2023Q4)	0.005		
	(0.082)		
ESG×Post	0.314***	0.421***	0.401***
	(0.119)	(0.114)	(0.112)
Log(Issue Size)	0.045	0.033	
	(0.032)	(0.031)	
Senior Unsecured Dummy	-0.957**	-0.932**	
	(0.453)	(0.445)	
Subordinated Dummy	0.266	-0.320	
	(0.604)	(0.651)	
ROA	-20.5***	-19.5***	
	(7.51)	(6.69)	
D/E	-0.028	0.028	
	(0.059)	(0.057)	
Log(Total Assets)	-0.501***	-0.517***	
	(0.056)	(0.054)	
Time-to-Maturity	-0.035	0.154***	
	(0.026)	(0.045)	
Fixed-Effects			
Industry	Yes	Yes	Yes
Year-Quarter	No	Yes	Yes
ISIN	No	No	Yes
Adj. R2	0.4276	0.5258	0.7921
Observations	3,832	3,832	3,832

Two additional features strengthen the interpretation. First, the coefficient of $Post$ in Model 1 without the quarter fixed effects is small and insignificant, so the post-period does not shift all bonds' yields uniformly, and the effect is primarily on the seasoned ESG bonds. Second, the coefficient on ESG shows that the baseline ESG yield spread in the secondary market is negative (-18.1 bps for Model 1 and -38.2 bps for Model 2), consistent with the ESG issuance spread documented in Hypothesis 1. Adding the DiD term reverses the negative yield

spread, suggesting that the relative ESG advantage disappears and slightly reverses after the policy (-38.2 + 42.1 = +3.9 bps in Model 2).

The secondary-market evidence supports H2: the policy appears to reallocate demand toward newly eligible, on-the-run ESG supply, leaving older ESG issues with thinner liquidity and a higher off-the-run premium, which is reflected in a post-policy widening of the ESG yield spread among seasoned bonds.

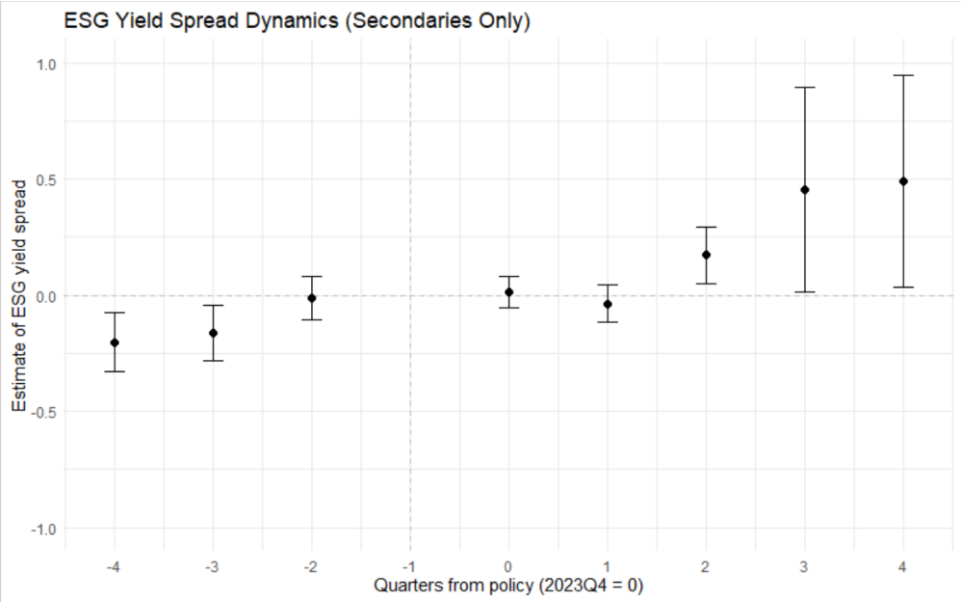
To unpack the timing of the secondary-market effect and to verify the identifying assumption, we complement the DiD in Table 4 with an event study. Specifically, for seasoned corporate bonds issued ≤ 2023Q3, we replace the single $ESG \times Post$ term with a set of event-time interactions $ESGb \times \mathbf{1}\{t = k\}$ and estimate:

$$Yield_{b,t} = \mu_b + \tau_t + \sum_{k \neq -1} \beta_k (ESG_b \times \mathbf{1}\{j = k\}) + \gamma' X_{b,t} + \varepsilon_{b,t} \quad (3)$$

Bond and quarter fixed effects, along with the same controls as before (size, remaining TTM, ROA, D/E, and assets), are included in the regression. We limit the estimation window to four quarters before and after the implementation of the Thai ESG Fund policy. Standard errors are clustered by bond. We set 2023Q3 as the reference period ($k = -1$). Figure 5 plots the β_k coefficients with 95% confidence intervals, so values near zero before the policy support parallel trends, while positive post-policy coefficients indicate a widening ESG yield spread over time.

Figure 5: Event-time estimates relative to 2023Q3.

Points plot coefficients on $ESG \times \mathbf{1}\{rel.\ quarter = k\}$ from a panel regression with bond and quarter fixed effects and standard controls; bars are 95% CIs, reference period = −1 (2023Q3).



In the pre-policy window, the ESG spread is modestly negative early on (-20.1 bps at k = -4 and -16.2 bps at k = -3), consistent with a small baseline greenium, and then converges to zero by k = 2. Beginning two quarters after the policy, the spread reverses sign and becomes positive and significant, reaching 49.2 bps by k = 4. The dynamics indicate a lagged reallocation of demand toward newly issued, on-the-run ESG bonds, resulting in pre-policy ESG bonds being relatively less liquid and repriced at higher yields. The timing is consistent with the new ESG bond issues in 2024, which occurred in Q3 and Q4 (k = 3 and 4). In conjunction with H1 (a larger coupon discount at issuance), the event study shows that the policy reduces funding costs for new ESG deals, while, after a short adjustment, it raises required yields on older ESG bonds.

5. Conclusions

This paper evaluates a national sustainability policy through the lens of fixed-income pricing, distinguishing issuance from seasoned-market mechanisms. Using propensity-score matching at issuance and a DiD/event-study in the secondary market, we document a clear trade-off. First, in the primary market, ESG corporate bonds are priced at lower coupons than comparable non-ESG bonds, with an average greenium of -29 bps overall, which widens to -92 bps after 2023Q4. Second, among seasoned (pre-policy) bonds, ESG yields widen by 31 to 42 bps relative to non-ESG following the policy's start, with dynamics that are flat pre-policy and turn positive from two quarters after policy start, reaching 49 bps by the fourth quarter. These patterns are consistent with the policy of deepening bookbuilding demand for new ESG supply, while reallocating investor attention and liquidity away from older ESG issues, thereby increasing their off-the-run liquidity premium.

The policy implications are direct. For issuers, the program delivers material primary-market savings – tens of basis points at issuance – translating into meaningful reductions in interest expense. For investors and policymakers, the same design appears to redistribute liquidity intertemporally, improving terms for new ESG deals while raising required yields on older ESG paper. If the goal is to support both new issuance and the depth of the outstanding ESG curve, design tweaks could help: (i) eligibility windows that include a portion of seasoned ESG bonds; (ii) portfolio guidelines or quotas that reserve a share for non-current (off-the-run) ESG holdings; and (iii) encouraging market-making/liquidity facilities targeted at seasoned ESG names.

The secondary-market analysis results are robust across specifications and remain stable after controlling for bond and time fixed effects, with bond-level clustering. Still, two

limitations merit caution. First, the post-policy window is short, and effects beyond +4 quarters remain to be mapped with more data. Second, while our mechanism interpretation fits the timing and heterogeneity we observe, a direct link to portfolio flows and holdings would further solidify the channel.

Future research can build on three extensions. First, integrate mutual-fund holdings and flow data to track how Thai ESG Fund subscriptions are reflected in primary allocations and secondary-market trading in real-time. Second, investigate heterogeneity in liquidity proxies (issue size, age, and rating) and bond features (callability and coupon type) to quantify where the off-the-run premium is most pronounced. Third, as more post-policy quarters arrive, reassess the persistence of the secondary-market widening and whether liquidity equilibrates once the initial wave of new supply absorbs policy-driven demand.

Overall, our evidence suggests that a well-intended tax incentive for sustainable investment can simultaneously lower the cost of capital for new ESG issuances and increase the liquidity premium on outstanding ESG bonds. Recognizing and managing this trade-off is crucial to designing sustainable finance policies that promote both new capital formation and healthy secondary market functioning.

REFERENCES

Baker, M., Bergstresser, D., Serafeim, G., & Wurgler, J. (2018). Financing the response to climate change: The pricing and ownership of US green bonds (No. w25194). National Bureau of Economic Research.

Bao, J., Pan, J., & Wang, J. (2011). The illiquidity of corporate bonds. Journal of Finance, 66(3), 911-946.

Caramichael, J., & Rapp, A. C. (2024). The green corporate bond issuance premium. Journal of Banking & Finance, 162, 107126.

Dick-Nielsen, J., Feldhütter, P., & Lando, D. (2012). Corporate bond liquidity before and after the onset of the subprime crisis. Journal of Financial Economics, 103(3), 471-492.

Fatica, S., Panzica, R., & Rancan, M. (2021). The pricing of green bonds: Are financial institutions special? Journal of Financial Stability, 54, 100873.

Flammer, C. (2021). Corporate green bonds. Journal of Financial Economics, 142(2), 499-516.

Fontaine, J.-S., & Garcia, R. (2012). Bond liquidity premia. Review of Financial Studies, 25(4), 1207-1254.

Gianfrate, G., & Peri, M. (2019). The green advantage: Exploring the convenience of issuing green bonds. Journal of Cleaner Production, 219, 127-135.

Goldreich, D., Hanke, B., & Nath, P. (2005). The price of on-the-run liquidity. Review of Finance, 9(1), 1-32.

Koziol, C., Proelss, J., Roßmann, P., & Schweizer, D. (2022). The price of being green. Finance Research Letters, 50, 103285.

Krishnamurthy, A. (2002). The bond/old-bond spread. Journal of Financial Economics, 66(2-3), 463-506.

Larcker, D. F., & Watts, E. M. (2020). Where's the greenium? Journal of Accounting and Economics, 69(2-3), 101312.

Löffler, K. U., Petreski, A., & Stephan, A. (2021). Drivers of green bond issuance and new evidence on the "greenium". Eurasian Economic Review, 11(1), 1-24.

Pástor, Ľ., Stambaugh, R. F., & Taylor, L. A. (2021). Sustainable investing in equilibrium. Journal of Financial Economics, 142(2), 550-571.

Prajapati, D., Dipen, P., Malik, S., & Mishra, D. K. (2021). Understanding the preference of individual retail investors on green bond in India: An empirical study. Investment Management & Financial Innovations, 18(1), 177.

Ratanabanchuen, R., & Saengchote, K. (2020). Institutional capital allocation and equity returns: Evidence from Thai mutual funds' holdings. Finance Research Letters, 32, 101085.

Ratanabanchuen, R., & Saengchote, K. (2021). Chasing returns with high-beta stocks: Evidence from tax-privileged mutual funds in Thailand. Economics and Business Letters, 10(1), 37-44.

Tang, D. Y., & Zhang, Y. (2020). Do shareholders benefit from green bonds? Journal of Corporate Finance, 61, 101427.

van der Beck, P. (2021). Flow-Driven ESG Returns. Swiss Finance Institute Research Paper, (21-71).

Vayanos, D., & Vila, J.-L. (2021). A preferred-habitat model of the term structure of interest rates. Econometrica, 89(1), 77-112.

Wang, L., & Wu, J. (2022). Investor ESG Tastes and Asset Pricing: Evidence from the Primary Bond Market. Available at SSRN, 4136605.

Zerbib, O. D. (2019). The effect of pro-environmental preferences on bond prices: Evidence from green bonds. Journal of Banking & Finance, 98, 39-60.