

DANGEROUS LIAISONS? DEBT SUPPLY AND CONVENIENCE YIELD SPILLOVERS IN THE EURO AREA

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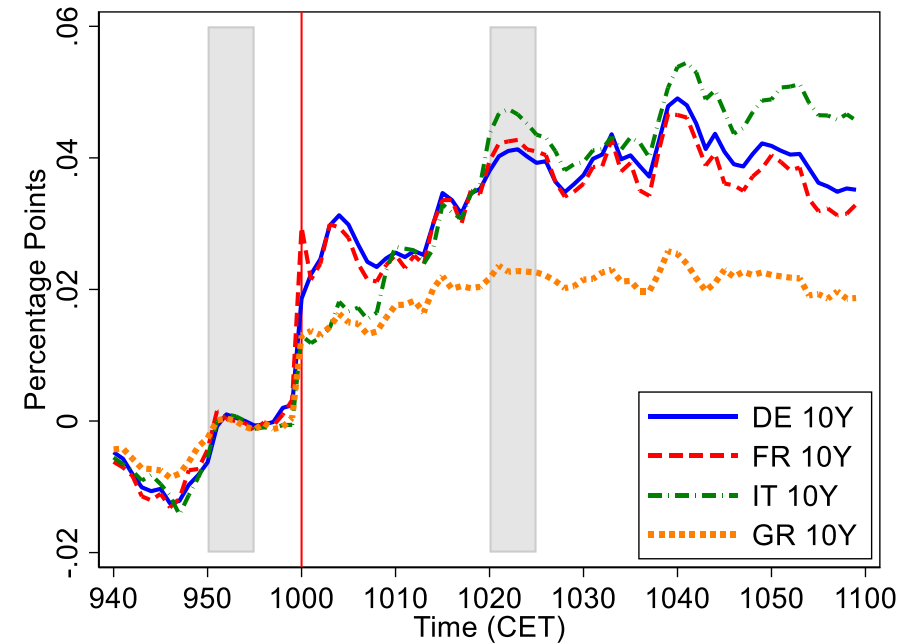
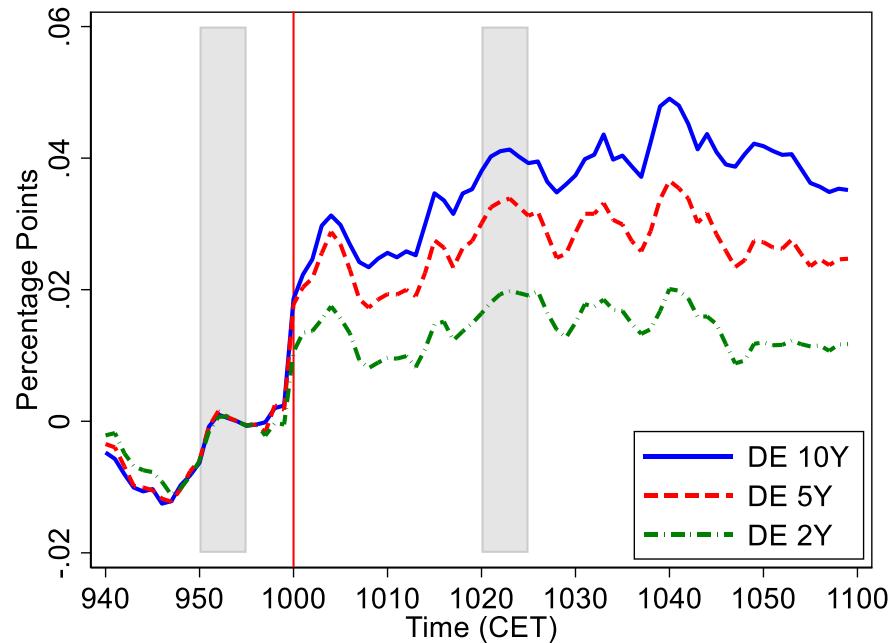
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MOTIVATION – WHAT MATTERS FOR LOW SOVEREIGN YIELDS?

- Many sovereign bond yields are often below the risk-free rate + default risk premium
 - Recent and dynamic literature on this “convenience yield”-premium
- When a country issues more sovereign bonds, its convenience yield declines
 - Krishnamurthy & Vissing-Jorgensen 2012; Jiang, Lustig, Van Nieuwerburgh, Xiaolan 2022; Reis 2022
- But does a country’s convenience yield also change when another country issues more bonds?
 - If investors buy more bonds from one country, do they buy fewer bonds from others?
 - What issuer characteristics determine these spillovers (substitution effects)?

DEBT ISSUANCE SPILLOVERS – AN ILLUSTRATIVE EXAMPLE

- On 14 December 2022 at 10:00 CET, the German debt management office („Deutsche Finanzagentur“) published its debt issuance plan for 2023
- Market commentary suggests that the total amount exceeded expectations



Source: Bloomberg, ESM calculations

MAIN RESULTS: A NEW TYPE OF SPILLOVER

- Two main empirical findings about spillovers of safe-country debt supply shocks
 - 1) To other “safe” countries (FR, NL, ...): Convenience yields fall in “receiving” countries as much as in issuing countries, i.e., spillovers are one-to-one
 - 2) To “riskier” countries (IT, ES, PT): Convenience yields also fall, but spillovers are weaker (around 2/3)
- We explain these findings in a two-country model with heterogeneous default risk
 - All safe bonds are useful to hedge against recessions -> high substitutability
 - Risky bonds are particularly risky in recessions, hence not a good hedge -> low substitutability

AGENDA

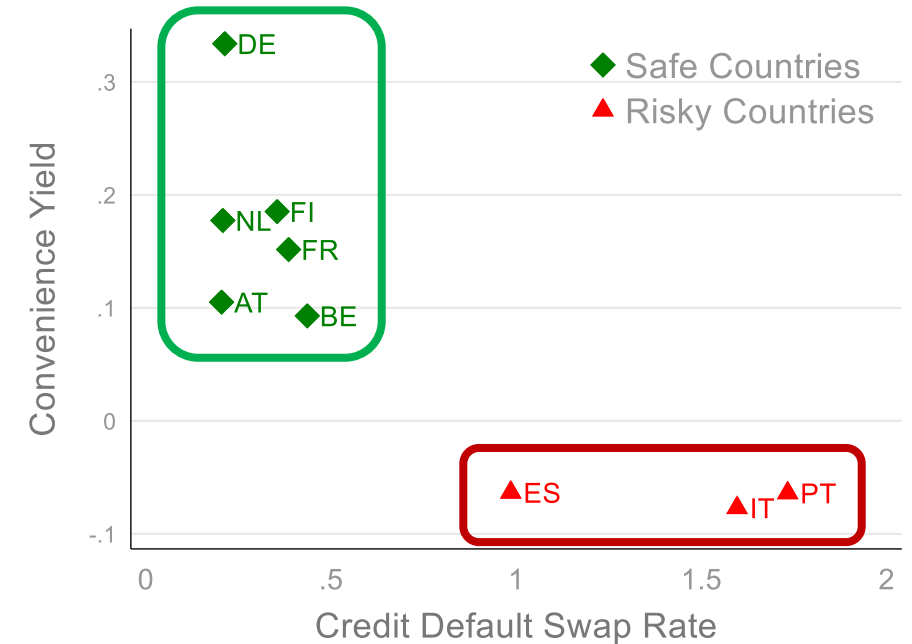
1. **Data & Empirical Strategy**
2. Empirical Results
3. Theoretical Rationalization

DATA & DEFINITION : CONVENIENCE YIELDS IN EURO AREA

- Convenience yield definition (Jiang et al. 2020):

$$Y_t^i = R_t + \delta_t^i - CY_t^i$$

- Y: simple (10-year) yield
 - R: risk-free rate reflected in *Overnight Index Swap* rates
 - δ : default risk premia reflected in *Credit Default Swap* rates
 - CY: convenience yield
- Safe countries' bonds earn a premium for being reliably liquid, remain valuable in recessions, and are insulated from risk contagion effects



Notes: This figure plots median 10-year convenience yields and median 10-year CDS rates for each country in the main data set. Sample period: 2009-2023.

CHALLENGES FOR ESTIMATING DEBT ISSUANCE SPILLOVERS

- Many euro area (convenience) yields are highly correlated, which could be due to...
 - Common shocks (e.g., monetary policy, global financial cycle, flight to safety)
 - Large spillovers of country-specific shocks
- To identify spillovers of debt issuance, we study yield co-movements around news about German debt issuance
 - Actual changes in bond supply are usually anticipated
 - Use high frequency changes (30-minute) around DFA's quarterly announcements about debt issuance since 2011
 - Daily spillover estimates from an IV estimation (the IV is the 30-min yield jump)

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HIGH-FREQUENCY YIELD SPILLOVERS FROM GERMANY

- Response to a change in the German yield within a 30-min. window around news about German debt supply:
 - French (safe) yields co-move almost one-to-one
 - Italian and Spanish (riskier) yields co-move less
- What about convenience yields, daily changes, other countries?

TABLE 1: Intraday Yield Spillovers from Germany (Method 1: OLS)

	<i>Safe Countries</i>	<i>Risky Countries</i>	
	(1)	(2)	(3)
	ΔY_{FR}	ΔY_{IT}	ΔY_{ES}
ΔY_{DE}	0.88*** (0.10)	0.62*** (0.21)	0.51** (0.24)
Constant	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Observations	44	43	39
R^2	0.80	0.20	0.20

Notes: Each column displays coefficients from a separate regression: $\Delta Y_{Destination,t} = \beta_0 + \beta_1 * \Delta Y_{DE,t} + \epsilon_t$. Standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

CONVENIENCE YIELD SPILLOVERS FROM GERMANY

- Spillovers to **safe** countries are almost 1-for-1...
- ... but smaller and insignificant to **riskier** countries, unless CDS rates are low

TABLE 2: Daily Convenience Yield Spillovers from Germany (Method 2: IV)

	<i>Safe Countries</i>						<i>Risky Countries</i>				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	ΔCY_{FR}	ΔCY_{NL}	ΔCY_{FI}	ΔCY_{AT}	ΔCY_{BE}	Pool	ΔCY_{IT}	ΔCY_{ES}	ΔCY_{PT}	Pool	Pool
ΔCY_{DE}	0.92*** (0.23)	0.97*** (0.25)	1.19*** (0.21)	0.67*** (0.24)	1.14** (0.56)		0.79 (0.85)	-0.43 (0.90)	1.62 (1.05)		
ΔCY_{DE}						0.98*** (0.22)				0.66 (0.65)	0.89*** (0.25)
ΔCY_{DE} $\times \mathbb{1}\{CDS_t > 1\}$											-0.48 (1.19)
Constant	-0.00 (0.00)	0.00 (0.01)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.01)	-0.00 (0.00)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Observations	44	44	44	44	44	220	44	44	44	132	132

Notes: Columns (1)-(10) display coefficients from separate regressions: $\Delta CY_{Destination,t} = \beta_0 + \beta_1 * \Delta CY_{DE,t} + \epsilon_t$ while column (11) is based on $\Delta CY_{Destination,t} = \beta_0 + \beta_1 * \Delta CY_{DE,t} + \beta_2 * \Delta CY_{DE,t} * \mathbb{1}\{CDS_t > 1\} + \epsilon_t$. Daily change in the German convenience yield is instrumented with the 30-minute yield change

SIMILAR SPILLOVERS FROM FRENCH DEBT ISSUANCE

- Spillovers from France have similar pattern: almost 1-for-1 to other **safe** countries, but smaller to **riskier** countries (using heteroskedasticity-based Rigobon-Sack estimator)

TABLE 7: Convenience yield spillovers from French supply shocks using the RS estimator

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ΔCY_{DE}	ΔCY_{NL}	ΔCY_{FI}	ΔCY_{AT}	ΔCY_{BE}	ΔCY_{IT}	ΔCY_{ES}	ΔCY_{PT}
ΔCY_{FR}	1.259*** (0.388)	0.852** (0.350)	0.772* (0.430)	0.906*** (0.272)	0.949*** (0.307)	-0.192 (0.542)	0.735 (0.636)	1.664 (4.142)
Constant	0.001 (0.003)	0.002 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	0.003 (0.006)	0.003 (0.005)	0.017 (0.018)
N	44	44	44	44	44	44	44	44
Weak IV	4.576	5.131	3.926	3.950	4.848	3.969	3.991	7.614
Overid.	0.235	0.755	0.482	0.455	0.743	0.830	0.793	0.236

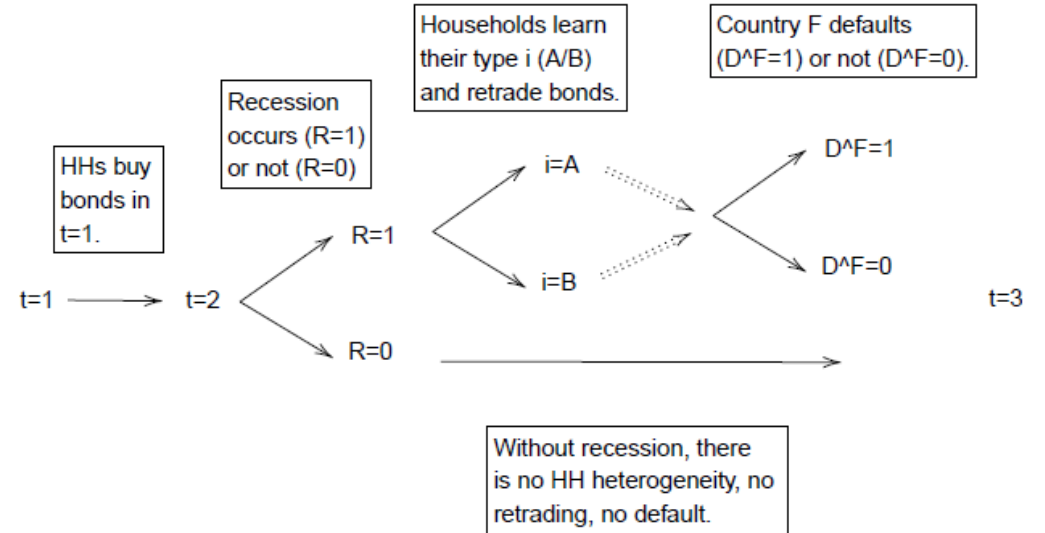
Notes: This table report coefficient estimates of equation $\Delta CY_{receiving} = \alpha + \beta \Delta CY_{FR} + \varepsilon$ using the RS estimator described in Section 4.4. Each column corresponds to a different receiving country.

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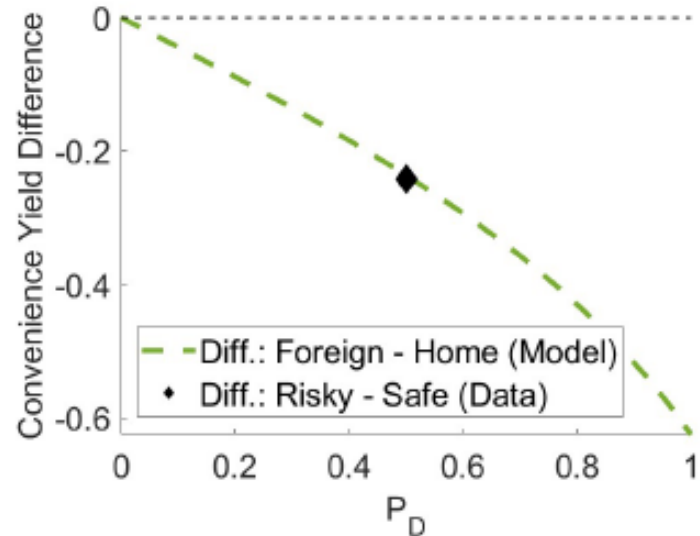
BRUNNERMEIER ET AL. (2024) WITH 2 COUNTRIES & DEFAULT

- 2 countries (H, F) issue bonds in $t=1$
 - Sovereign bonds are liquid, even in recessions
 - Foreign potentially defaults in $t=3$
- Ex-ante identical households buy bonds
 - Exogenous income, low and heterogeneous in recessions
 - => idiosyncratic income risk at $t=2$
- Convenience yields arise ...
 - because of insurance value (bonds can be sold in recessions to alleviate income losses)
 - ... but foreign bonds lose value in recession because default risk rises



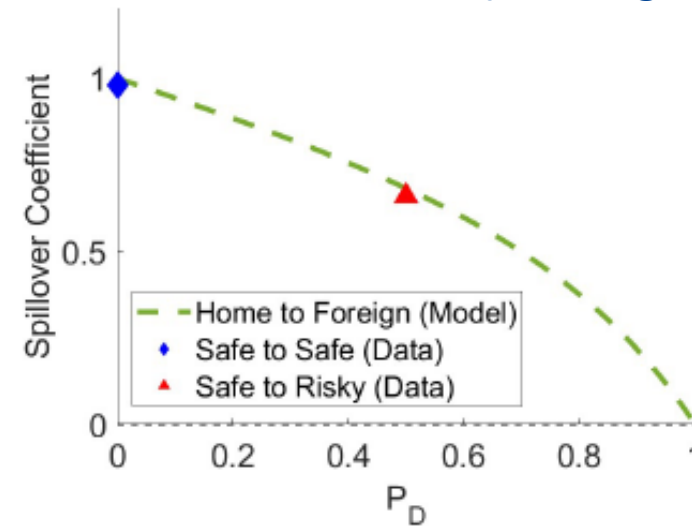
DEFAULT RISK REDUCES CONVENIENCE YIELD & SPILLOVERS

Proposition 1: Foreign convenience yield is lower and the differential increases with default risk (in foreign country)



(A) The Role of Default Risk

Proposition 3: In response to debt supply change in home, relative change in foreign convenience yield falls with default risk (in foreign country)



(B) Spillover Coefficient ($\Delta CY_F / \Delta CY_H$)

Intuition: When foreign default risk increases, foreign bond prices drop more in case of recession, hence they are less useful as insurance (Prop. 1) and less good substitutes for home bonds (Prop. 3)

SUMMARY & POLICY IMPLICATIONS

- Spillovers of safe-country debt issuance to (convenience) yields of other safe countries are one-for-one, but weaker for riskier countries
 - In line with stylized two-country model of safe asset re-trading à la Brunnermeier et al. (2024)
- For maintaining high convenience yields (low sovereign yields) in the euro area ...
 - ... it matters **how much debt is issued in total**
 - ... it matters **less who issues it** (DE, FR, EU ...)
- This underscores the importance of coordinating national fiscal policies
 - Fiscal rules can address negative externalities of debt issuance

ANNEX



DFA ANNOUNCEMENT OF DECEMBER 2022

"Ein Pauenschlag"

Die Experten der Landesbank Baden-Württemberg (LBBW) sprachen von einem "Pauenschlag". "Es war zwar klar, dass der Finanzbedarf des Bundes angesichts der gewaltigen Ausgaben zur Abfederung der Energiekrise auf Rekordkurs gehen würde", sagte Analyst Elmar Völker. "Ein Aufschlag von rund 20 Prozent gegenüber 2022 bei den Gesamtemissionen ist indes beachtlich."

Source: <https://www.tagesschau.de/wirtschaft/bund-schuldenaufnahme-rekord-101.html>

INSTRUMENT FIRST STAGE

TABLE A.3: Decomposition of Effect of Instrument on German Convenience Yield

	(1)	(2)	(3)	(4)
	ΔY_{DE}	ΔOIS	ΔCDS_{DE}	ΔCY_{DE}
ΔY_{DE}	1.45** (0.66)	0.74 (0.66)	-0.22** (0.10)	-0.93*** (0.26)
Constant	-0.01 (0.01)	-0.01 (0.01)	0.00 (0.00)	0.00 (0.00)
Observations	44	44	44	44
R^2	0.13	0.06	0.06	0.18
F	4.79	1.29	5.49	12.59

CDS RATES DO NOT MOVE ON DEBT ISSUANCE NEWS

TABLE A.11: Effects on 5-Year Credit Default Swap Rates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ΔCDS_{DE}	ΔCDS_{FR}	ΔCDS_{NL}	ΔCDS_{FI}	ΔCDS_{AT}	ΔCDS_{BE}	ΔCDS_{IT}	ΔCDS_{ES}	ΔCDS_{PT}
ΔY_{DE}	-0.05 (0.05)	0.05 (0.16)	-0.11 (0.08)	0.08 (0.08)	0.12 (0.10)	0.10 (0.26)	-0.81 (0.71)	0.09 (0.40)	-0.07 (0.89)
Constant	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.01)	0.01 (0.01)	0.01 (0.01)	-0.00 (0.02)
Observations	44	44	44	44	44	44	44	44	44
R^2	0.00	0.00	0.01	0.01	0.01	0.00	0.03	0.00	0.00

YIELD SPILLOVERS FROM GERMANY

- Spillovers from Germany to other core countries are almost 1-for-1, but smaller to non-core countries

TABLE 4: Daily Yield Spillovers - German Debt Supply Shocks

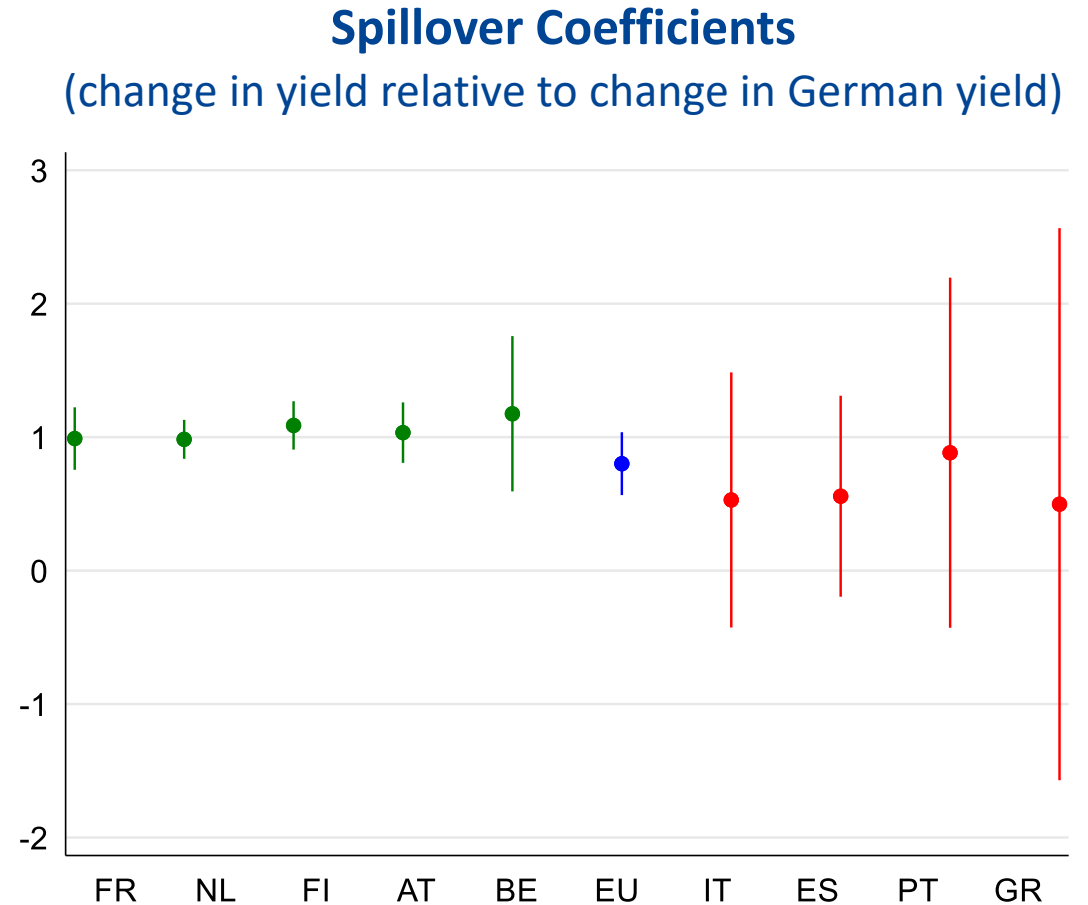
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ΔY_{FR}	ΔY_{NL}	ΔY_{FI}	ΔY_{AT}	ΔY_{BE}	ΔY_{IT}	ΔY_{ES}	ΔY_{PT}
ΔY_{DE}	0.989*** (0.116)	0.984*** (0.072)	1.088*** (0.090)	1.034*** (0.112)	1.175*** (0.288)	0.529 (0.474)	0.557 (0.373)	0.883 (0.650)
Cons.	0.004 (0.003)	0.001 (0.002)	0.003 (0.002)	0.002 (0.003)	0.006 (0.006)	0.015* (0.008)	0.009 (0.008)	0.016 (0.012)
Obs.	44	44	44	44	44	44	44	44
R^2	0.830	0.958	0.938	0.849	0.470	0.288	0.335	0.150

Notes: Each column displays coefficients from a separate regression: $\Delta Y_{receiving} = \beta_0 + \beta_1 * \Delta Y_{DE} + \epsilon$, where the daily change in the German yield is instrumented with the 30-minute change. Standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

SOVEREIGN YIELDS - DEBT ISSUANCE SPILLOVERS (FROM DE)

Spillovers of debt issuance in Germany ...

- are 1-for-1 to **safe** countries
- are smaller (and insignificant) to **riskier** countries



Source: Bloomberg, ESM calculations

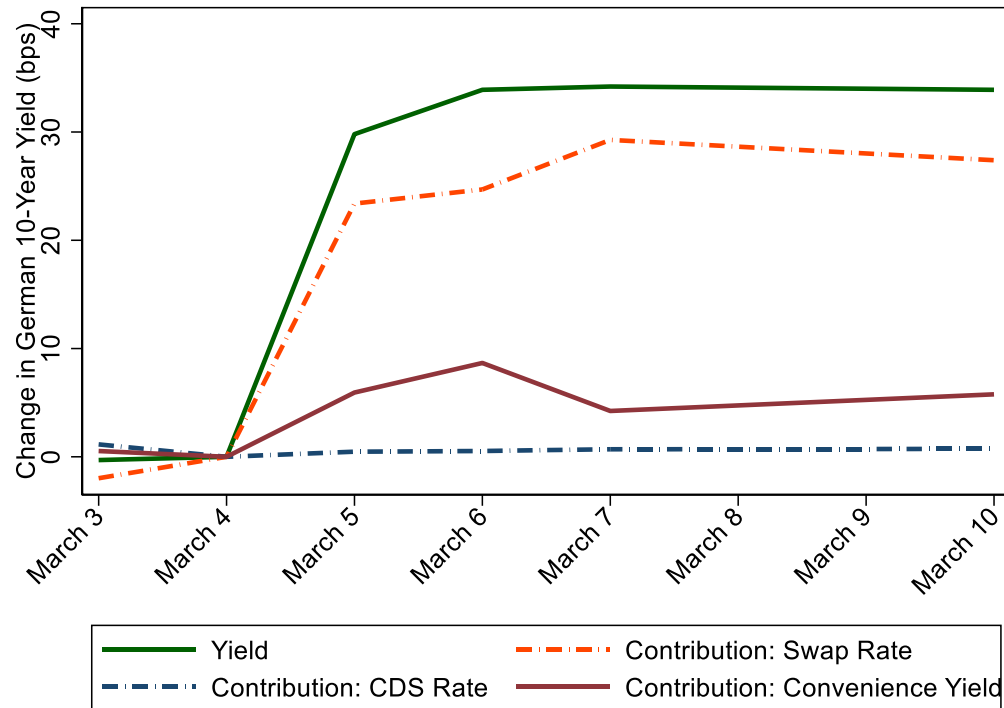
BONUS FINDINGS 1: GEOGRAPHY MATTERS

TABLE 4: Daily Spillovers from Germany Beyond Euro Area Sovereign Bonds (Method 2: IV)

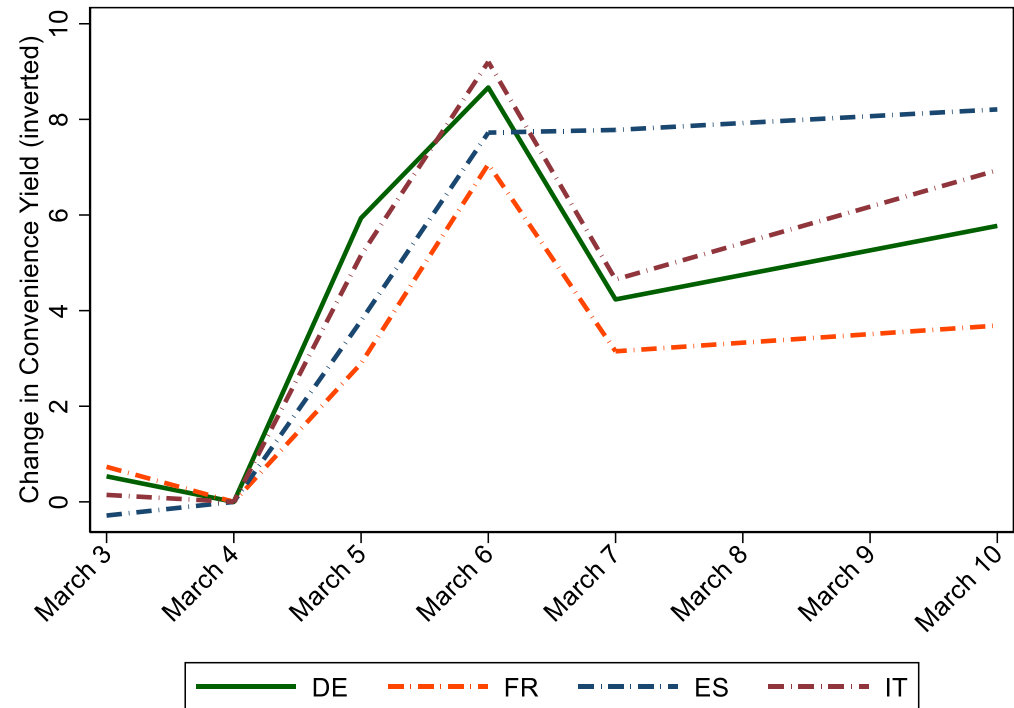
	<i>EA Non-Sov.</i>		<i>European Sovereigns</i>					<i>Non-European Sovereigns</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	ΔY_{EU}	ΔY_{AAA}	ΔY_{GB}	ΔY_{DK}	ΔY_{SE}	ΔY_{NO}	ΔY_{CH}	ΔY_{US}	ΔY_{JP}	ΔY_{CA}	ΔY_{AU}
ΔY_{DE}	0.80*** (0.12)	0.91*** (0.18)	1.03*** (0.28)	1.05*** (0.12)	1.32** (0.56)	1.35** (0.53)	0.39 (0.26)	0.46 (0.37)	0.08 (0.09)	0.32 (0.33)	0.41 (0.55)
Constant	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.01 (0.01)	0.01 (0.01)	-0.00 (0.00)	-0.01 (0.01)	-0.00* (0.00)	-0.01 (0.00)	-0.01 (0.01)
Observations	38	44	44	44	44	44	44	44	44	44	44

BONUS FINDINGS 2: THE RECENT SHIFT IN GERMAN FISCAL POLICY (5 MARCH 2025)

Increase in German 10-year yield (34bps) on March 5&6 due to increase in interest rate expectations (25bps) and loss of convenience yield (9bps)

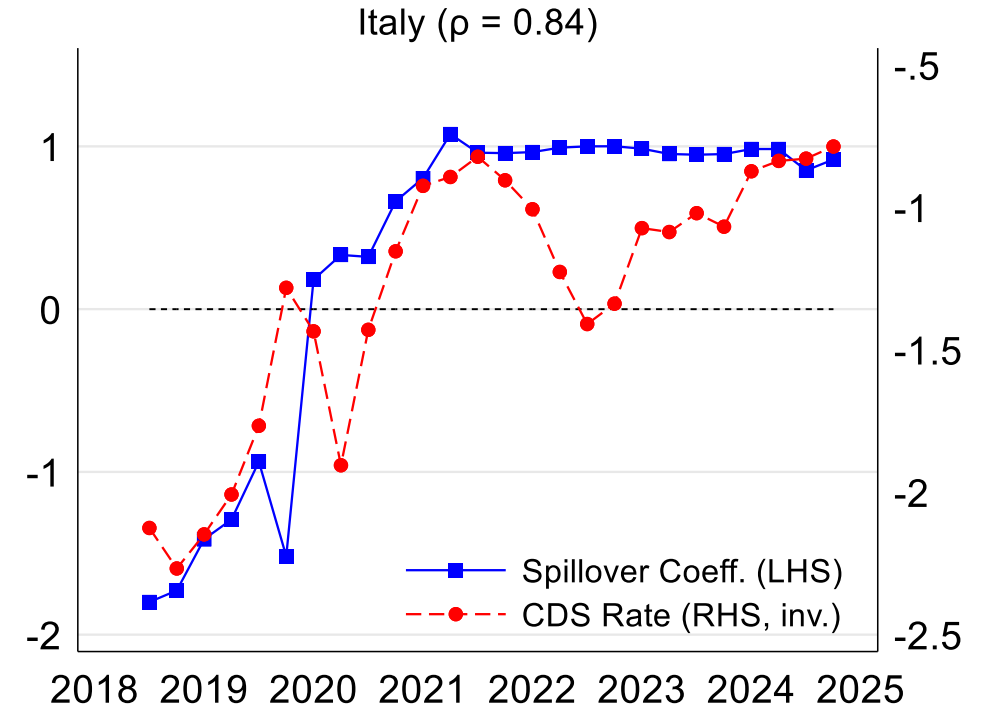
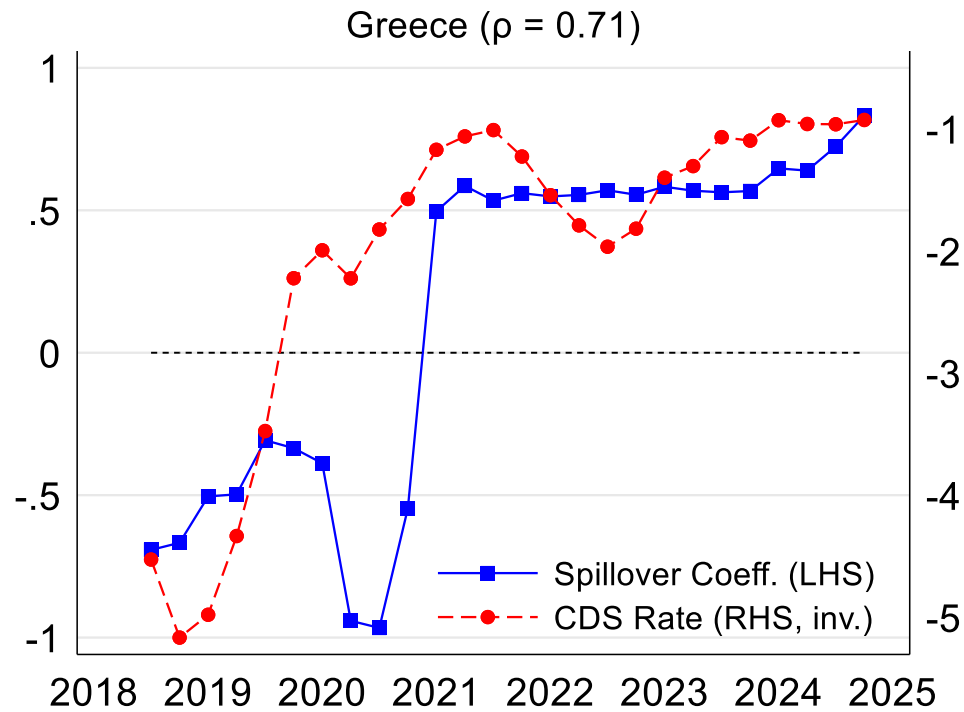


Convenience yield spillovers are 1-for-1, suggesting that currently also IT and ES debt is highly substitutable for German debt



BONUS FINDINGS 3: LARGE SPILLOVERS COINCIDE WITH LOW RISK PREMIA

Spillover Coefficients (blue) & Credit Default Swap Rates (red)
(correlations in parentheses)



Source: Bloomberg, ESM calculations