A new safe asset in euros? Not without a large investor base

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A safe asset needs a large and stable base of potential investors

European Commission tried to manufacture new safe asset in euros ("Eurobonds") during Covid

- Joint and several liability of member countries, AAA-rated. Hailed as "Hamiltonian moment"
- €600 Bn currently outstanding and further issuance planned, very liquid secondary market
- Treated as sovereign debt by European Central Bank in QE purchases and repo facility
- But traded as a "supranational" by market makers and fixed-income index providers, akin to
  - Other EU-related institutions like the European Investment Bank, all with long-standing, large, AAA-rated debt
  - Government-sponsored enterprises (GSEs) by member countries like German KFW, also large and AAA-rated

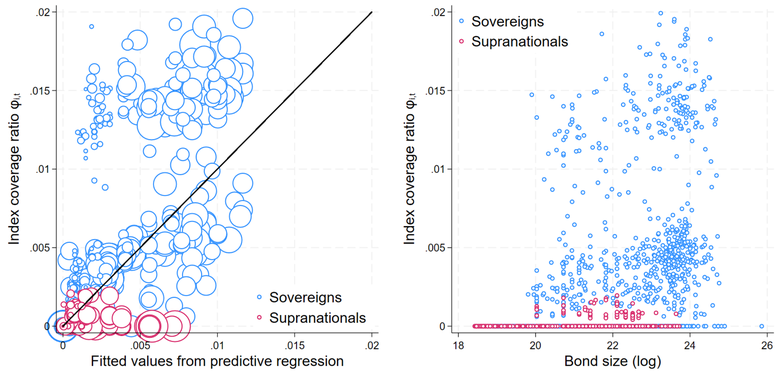
Yet rates are higher than for sovereigns (in the cross-section) and more volatile (over time).

Why AAA, large, liquid market is not enough? Liquidity *during crises* is all that matters:

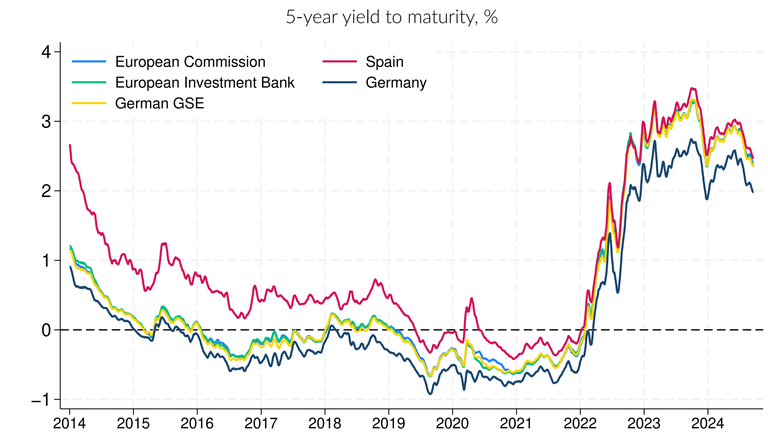
- Investment mandates (restrictions on investment universe) exclude supranationals: harder to find counterparty during crisis if fewer potential investors (mkt segmentation)
- Expectations about "conditional QE" (untargeted asset purchases during crises): matter more for issuers with fewer potential investors than for sovereigns

Fact 1: Sovereign bonds have large potential investor base

- Consider mutual fund m and its benchmark j. Each index is sum of AUMs of tracking funds $\Theta_t^j = \Sigma_m \theta_{m,t}^j$
- For any given index, bond i has specific weight at each date t and $\Sigma_i \omega_{i,t}^j = 1$
- Imagine all funds invest according to weights of respective index $\Omega_{i,t}^j = \Theta_t^j \omega_{i,t}^j$
- For each bond i, can compute what fraction of outstanding is bought by funds $\Phi_{i,t} = \Sigma_j \Omega_{i,t}^j / T_{i,t}$

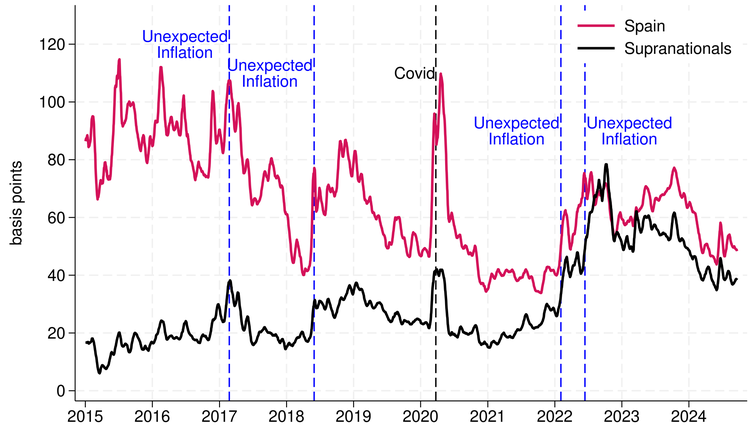


Fact 2: All supranationals pay the exact same interest rate



Only legal status in common (not technically governments) $\Longrightarrow$ same potential investors

Fact 3: Supranationals most affected by beliefs on conditional QE



A model of market segmentation and limits to arbitrage

Model to match stylized facts in cross-section and time series **jointly**

- Discrete time (3 periods), n symmetric issuers, no default risk. Similar to Coppola et al (2023)
- Issue bonds that pay \$1 in $t = 2$, endogenous market price at 0 and 1: P_0^i and P_1^i
- 2 classes of investors similar to Vayanos and Vila (2021):
  1. Investors with **long-dated** liabilities (e.g. pension, insurance, banks). **"Preferred-habitat"** hold to maturity
  2. Investors with **short-dated** liabilities (e.g. mutual funds, MMMFs). **"Arbitrageurs"** with potential liquidity needs
- For each issuer i, exogenous supply at face value S gives market clearing at $t = 0$

$$P_0^i S = \underbrace{A^i - B P_0^i}_{Preferred-habitat} + \underbrace{\omega^i(\cdot)}_{Arbitrageurs}$$

- In $t = 1$ fraction ϕ of Arbitrageurs needs to liquidate assets, symmetric problem is

$$\max_{\{\omega^i\}_{i=1}^n} \mathbb{E}\left[\sum_{i=1}^n \frac{\omega^i}{P_0^i}\left(\phi \cdot P_1^i + (1-\phi)\cdot 1 - P_0^i\right)\right] \quad \text{s.t.} \quad \sum_{i=1}^n \omega^i = 1.$$

- Exogenous parameter Γ^i is *size of potential investors* for issuer i in $t = 1$ (Duffie et al (2005))

$$m^i = \lambda\left(m_S^i\right)^\theta \left(m_B^i\right)^\theta = \lambda\left(\phi\frac{\omega^i}{P_0^i}\right)^\theta \left(\Gamma^i\right)^\theta, \qquad \mathbb{E}\left[P_1^i\right] = \frac{m^i}{m_S^i}$$

- Simplification with $\theta = 1, A^i = A\ \forall i$: spread is function of $\Gamma^i(-)$ and $\Gamma^z(+)$

$$\zeta_{i,z} = \left[-\ln\left(P_0^i\right)\right] - \left[-\ln\left(P_0^z\right)\right] = \ln\left(\frac{\phi\lambda\Gamma^z + (1-\phi)}{\phi\lambda\Gamma^i + (1-\phi)}\right)$$

- Issuers with small size of potential investors (e.g. supranationals) earn lower convenience yield

Corollary 1 (spreads in the cross-section)

The initial price for issuer i, P_0^i, is increasing in the size of potential investors in i, Γ^i, but decreasing in the size of potential investors in other securities $\{\Gamma^j\}_{j\neq i}$. Therefore, the spread of issuer i to any other issuer, $\zeta_{i,j}\ \forall j \neq i$, is decreasing in Γ^i.

- Larger Γ^i is associated with more holdings by Arbitrageurs even if bonds are more expensive

Corollary 2 (investor base in the cross-section)

The market share of arbitrageurs, ρ^i, is **decreasing** in the inelastic demand A^i (home bias) and **increasing** in the size of potential investors Γ^i (investment mandates).

$\Longrightarrow$ strong predictions regarding the investor base of supranationals vs governments

1. **Arbitrageurs** skew portfolio away from supranationals (pay premium for liquidity during crises)
2. **Preferred-habitat** skew portfolio toward supranationals (don't care about liquidity, only return)

Interaction of investment mandates and conditional QE

Investment mandates are slow-moving $\Longrightarrow$ Γ^i cannot explain time series

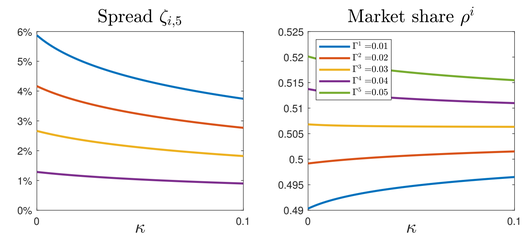
- Asset purchases by the central bank can be of 2 types
  1. Unconditional: planned (A^i), **monetary policy** tool
  2. Conditional: during crises (Γ^i), **market stability** tool
- Introduce measure of **expected** conditional QE for issuer i, QE^i

$$m^i = \lambda\left(m_S^i\right)^\theta \left(m_B^i\right)^\theta = \lambda\left(\phi\frac{\omega^i}{P_0^i}\right)^\theta \left(\Gamma^i + QE^i\right)^\theta$$

- But by treaty ECB must treat all issuers equally (capital key) so $QE^i = \kappa\ \forall i$
  1. Issuer-specific level is absorbed into Γ^i, κ is common *time* variation
  2. Does not predict *ex-post* purchases are equalized
  3. Only concerns flow of purchases during crisis, not stock
- Higher-than-expected inflation translates into more restrictive policy and hence lower κ

Variations in conditional QE κ over time

Numerical version of the model with 5 symmetrical issuers but different $\Gamma^i \in [0.01, 0.05]$

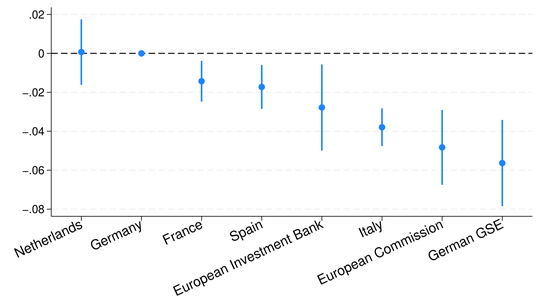


A decrease in κ causes

1. Spreads increase more for issuers with lower Γ^i
2. Effect on spreads is nonlinear
3. Arbitrageurs buy issuers with high Γ^i, sell issuers w/ low Γ^i

Test: regress $\Delta\rho_i$ between 2021Q4 and 2022Q2 on issuer FE and bond characteristics

$$\Delta\rho_i = \mu_i + z_i'\zeta + \varepsilon_i$$



Safety, size and liquidity are not sufficient to make a safe asset

- Sovereigns have huge advantage over comparably safe and large issuers: large investor base
- Very large effect (up to 100 basis points for a 10-year yield) and fiscal cost (≈€10 Bn per year)
- Large cost for mutual funds and foreigners, source of rents for pension, insurance and banks
- 3 broad policy implications
  1. **Non-gvt bonds are costly.** Much cheaper to issue sovereign bonds than the equivalent supranationals
  2. **Returns to broad investor base.** US earns conv yields because everybody can hold Treasuries
  3. **Nonlinearity in QT.** Spread unrelated to duration risk, safety premiums, maturities liquidity, default risk
- Mixed conclusions for programs of common EU borrowing:
  - Increasing the size of potential investors is hard (e.g. index inclusion has failed so far)
  + There is no "EU penalty", it's just market segmentation that favors sovereigns
- What is the cost of GSEs bonds exclusion from Fed purchases?