

Constructing euro area safe assets without mutualizing risk (much)

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Outline

1. Rationales
2. Proposals
3. Conclusion

Rationales

1. Eliminate the bank-sovereign doomloop in a way that does not have unacceptable distributional and political implications
 - Just applying regulation would lead to some combination of concentration charges and risk weights that imply that banks only hold diversified portfolios of AAA and AA rated bonds.
2. Reduce cross-border flights to safety
3. Create large euro-denominated safe government bond market
 - perhaps 3 trillion euro – three times as large a Bunds market, though still much smaller than U.S. treasury bond market

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1. Rationales

2. Proposals

- i. SBBS/ESBies
- ii. E-bonds
- iii. GDP-based national tranching
- iv. Safety comparison
- v. A safe asset based on ECB liabilities?

3. Conclusion

Sovereign bond-backed securities (SBBS)

(Brunnermeier et al 2011, 2017; ESRB task force 2018)

1. Private intermediaries purchase diversified portfolios of sovereign bonds

Weights reflect:

- GDP or ECB capital key: e.g. $P_i^{SB} \leq 0.6Y_i$
- Constraint on share of debt market than can be purchased e.g. $P_i^{SB} \leq 0.5D_i$

<i>Private intermediary</i>	
Assets	Liabilities
Sovereign bonds (100)	ESBies (70) EJBies (30)

2. Thickness of junior tranches is calibrated such that 5-year expected loss rate of senior tranche (ESBie) is about the same as that of German bonds

Properties

- No mutualization, no redistribution
- Cost of issuance does not change, except possibly via liquidity effects (traded volume of bonds declines because of SBBS portfolios).
- Can sustain ESBie volume in the order of up to 2-3 trillion
 - depends on maximum share of debt market purchased

SBBS: complications

Requires a (complex?) regulatory structure, and possibly coordination among sovereign issuers, to ensure that:

1. SBBS are homogeneous
2. Intermediaries do not bear or introduce extra risk (“robots” mapping sovereign bond debt service into SBBS payments)
3. Bonds from sovereigns that lose market access are excluded from SBBS portfolio
4. Bonds in SBBS portfolios are not discriminated in a debt restructuring
5. SBBS holders are adequately represented in a debt restructuring (e.g. by giving voting instructions to SBBS issuers)

Note: conditions 2, 3 and 4 are supposed to ensure that SBBS issuers never lose market access (arbitrage argument: if SBBS reflect only sovereign risk, there is no discrimination against SBBS issuers, and all sovereigns in SBBS portfolio enjoy market access, then SBBS must also enjoy market access).

A regulation of this type is currently making its way through the EP.

E-bonds

(Monti 2010, Leandro and Zettelmeyer 2018, Giudice et al 2019)

1. An official institution with preferred creditor status (e.g. ESM) lends to euro area countries up to a pre-set ceiling, financed by issuing “E-bonds”. Ceiling could be defined with respect to:

<i>Official issuer</i> (e.g. ESM)	
Assets	Liabilities
Senior sovereign loans (100)	Single-tranche safe asset (E-bond)

- Just GDP: $P_i^E = yY_i$. Then, set y so E-bond achieves desired 5-year expected loss rate (e.g. $y=0.2$)
- GDP and share of debt market: $P_i^E = \min\{yY_i, cD_i\}$. Then, set y and c to maximize E-bond volume s.t. desired 5-year expected loss rate (e.g. 0.25, 0.5)

2. All sovereigns pay same interest rates on loans = interest rate on E-bonds

Properties

- Some redistribution from more creditworthy to less creditworthy borrowers
- Marginal cost of issuance rises, particularly for high-debt countries, but average cost of issuance does not change much
- Maximum E-Bond Issuance volume in same order as ESBies (2-3 trillion)

E-bonds: complications

1. Requires a new official institution or a change in the ESM treaty (but not necessarily more capital, if issuer just passes on debt service received)
2. Hinges on establishing preferred creditor status in a legally and politically watertight way – through statute, by contract, or through a combination of the two.
 - Example: Italian *pari passu* clause for NY law bonds: these rank equally “except for such obligations as may be preferred by mandatory provisions of international treaties and similar obligations to which Italy is a party.”
 - This should protect sovereign who respects seniority of E-bond issuer from private litigation
 - BUT: Would euro area sovereigns respect seniority of E-bond issuer under all circumstances?

GDP-based national tranching + pooling

Wendorff and Mahle 2015, Leandro and Zettelmeyer 2018

1. Euro area sovereigns issue multi-tranche sovereign debt. Ceilings for senior sovereign tranches set in the same way as E-bond loan ceilings (e.g. $S_i = 0.2Y_i$, or $S_i = \min\{0.25Y_i, 0.5D_i\}$).

<i>Private intermediaries</i>	
Assets	Liabilities
Senior sovereign tranches (100)	Single-tranche safe asset

2. Private intermediaries purchase diversified portfolios of senior tranches and issue a single-tranche safe asset. (Alternative: no intermediaries at all – simply require banks to hold diversified portfolios of senior tranches).

Properties: “in the middle” between ESBies and E-bonds.

- No mutualization, no redistribution (like ESBies)
- Average cost of issuance does not change, except possibly via liquidity effects (like ESBies)
- In general, marginal cost of debt is cost of issuing junior tranche. Hence, will rise (like E-bonds)
- Same volume as E-bonds (and ESBies), i.e. \approx 2-3 trillion.

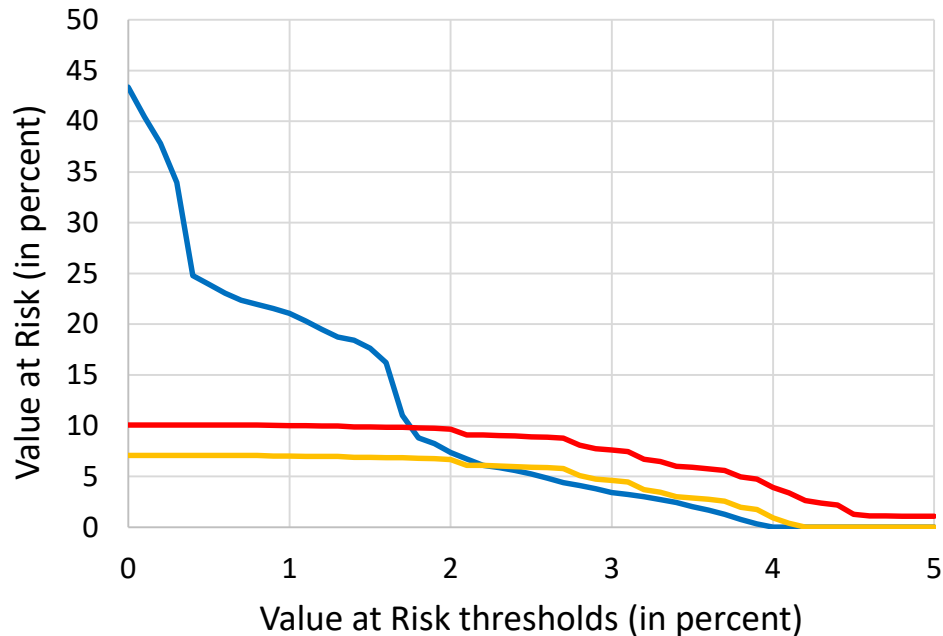
GDP-based national tranching: complications

1. Requires a legally and politically binding agreement on ceilings for senior tranche issuance
2. In variant in which private intermediaries issue single-tranche debt security: requires regulatory structure.
 - Similar objectives as SBBS regulation – in particular, to exclude new risks associated with intermediation.
 - However, fewer complications of SBBS: do not have to worry about “freezing junior tranche”, creditor representation in a restructuring is simpler due to one-tranche structure.
3. In variant without any intermediation:
 - may not need any regulation except adapting bank regulation to encourage diversified portfolios of senior tranches.
 - However, this comes at the cost of not obtaining a new market in homogenous, tradable safe assets.

Safety comparison

By construction, *expected loss rate* identical in all approaches. But *distribution* of losses (“Values at Risk”) differs. Below, VaRs based on Brunnermeier et al model

“Value at Risk at probability p ” = maximum loss occurring with probability p or higher



- ESBies
- E-Bonds and national tranching with equivalent subordination levels
- E-bonds with 3% capital

- ESBies offer better protection for smaller, more common default events
- E-bonds and NT offer better protection against extreme events.

Maximum Value at Risk (i.e. VaR at $p=0$):

- ESBies: 44% = (maximal loss given default = {60.6%-30% absorbed by junior tranche}/70% (nominal value of senior tranche).
- E-bonds and equivalent national tranching: (weighted average of losses-given-default suffered by senior tranches, which are zero for many countries

A safe asset based on ECB liabilities?

Idea: Banks could hold ECB time deposits or bonds in lieu of government bonds (e.g. Sandbu, 2019).

- Problem: need to sterilize impact on money supply. Doing so involves purchasing assets.
- Suppose sterilization is done by purchasing sovereign bonds in the ECB capital key. Then, production of an ECB safe asset looks a lot like issuing one-tranche SBBS (or E-bonds without the benefit of seniority).
- Fiscal cost of this – capitalization that would be required to absorb credit risk – is equivalent to the size of the SBBS junior tranches, i.e. 30/70 percent of safe asset
- Example: issuing 2.1 trillion in safe assets would require $2.1 * 3/7 = 0.9$ trillion (€ 900billion) in capitalization. This is enormous (ECB capital is presently €11 billion, ESM paid-in capital €80 billion).

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E-bonds and GDP-based national tranching deserve further study.

1. Advantages over SBBS

- Even safer, particularly in version with (small) capital buffer.
- Could be issued by an existing institution (E-bonds: ESM, after treaty change); or may not require any new institution at all (national tranching)
- Disciplining effect, supports fiscal responsibility

2. Potentially controversial features of E-bonds

- High debt countries may not like disciplining effect
- “North” may not like the (mildly) redistributive impact
- Unlike SBBS, *requires* a public issuer
- Works only if seniority of public issuer is respected

3. Potentially controversial features of GDP-based national tranching

- High debt countries may not like disciplining effect
- Requires SBBS-like private intermediation in order to deliver benefits of a homogenous safe debt market.

Backup slides

Summary: SBBS, E-bonds and GDP-based national tranching vs. euro area debt

Criterion	SBBS	E-bonds	National tranching	Euro area debt
Requires new institutions?	yes	no , but need to change ESM treaty	yes	yes
Tranched debt?	yes	no	yes	no
Raises marginal borrowing cost?	no	yes	yes	no
Issuer	Many private	One public	Many private	One public
Volume*	€2-3 trillion	€2-3 trillion	€2-3 trillion	No ex ante limit
Safety	Except when most of EA defaults	Even when most of EA defaults	Even when most of EA defaults	Depends on governance, size
Redistribution?	no	Yes, but small	no	Depends on expenditure side

Main approaches to creating euro area safe assets (historical overview)

1. Through full or partial guarantees
 - “Eurobond” proposals: De Grauwe and Moesen (2009), Bonnefoy (2010)
 - Blue bonds: Depla and von Weizsäcker (2010,2011)
 - Eurobills: Hellwig and Philippon (2011), Bishop (2013)
 - Purple bonds: Bini-Smaghi and Marcussen (2018).
2. Debt issued by a euro area budget or euro area SWF
 - Ubide (2015), Zettelmeyer (2017), Leandro and Zettelmeyer (2018b)
3. Debt instruments issued by financial intermediaries/intermediary, backed by a diversified pool of sovereign debt
 - lower sovereign risk by combining diversification with some form or seniority
 - Monti (2010), Brunnermeier et al (2011, 2017), Wendorff and Mahle (2015), Leandro and Zettelmeyer (2018a,b)

The Brunnermeier et al (2017) default model

Two-level hierarchical simulation model:

- First level simulates 2,000 five-year periods, in which economy is in one of three states:
 - 1) (5% of the time) Severe recession: high probabilities of default and losses-given-default.
 - 2) (25% of the time) Mild recession: LGD rates 80% of state 1
 - 3) (70% of the time) Expansion: LGD rates 50% of state 1
- Second level (5,000 draws) determines sovereign defaults, determined by random variable with Student-t distribution (fat-tailed) and conditional on aggregate state

Two calibrations:

- Benchmark: average default rates consistent with bond yields and CDS spreads at end of 2015, LGDs consistent with historical averages
- Adverse: higher cross-country correlations in default probabilities due to additional contagion assumptions (if Germany defaults, ...)

Italy's 2013 pari passu clause

“The Securities are the direct, unconditional and general and ... unsecured obligations of Italy and will rank equally with all other evidences of indebtedness issued in accordance with the Fiscal Agency Agreement and with all other unsecured and unsubordinated general obligations of Italy for money borrowed, ***except for such obligations as may be preferred by mandatory provisions of international treaties and similar obligations to which Italy is a party.***”

Source: Gelpern 2013

(<http://www.creditslips.org/creditslips/2013/04/italys-pari-passu-scrubbing.html>)

Euro area leveraged sovereign wealth fund

- Use small national contributions to start up a euro area leveraged sovereign wealth fund, which gradually capitalizes itself out of retained earnings.
- When desired debt volume and capital levels have been reached, stop growing, and pay a dividend back to taxpayers.

Assets	Liabilities
Diversified international portfolio	Safe asset
Cash	Capital

Problems:

- Does not create demand for national sovereign bonds that replaces potential decline in demand from banks
- The only thing more damning than “it’s a CDO!” may be: “it’s a hedge fund!”

E-bond purchase portfolio and expected losses

	Purchase volume in € billion	Purchase volume in % of			Implicit subordination level (%)	Brunnermeier et al		For E-bond issuer	
		country GDP	country debt	Portfolio		Five-year expected loss rates	Maximal losses-given-default (lgd1)	5-year exp. loss rate, %	maximal lgd assuming lgd1
Germany	706.4	22.5	45.5	27.31	54.5	0.50	40.0	0.00	0.0
Netherlands	155.0	22.1	45.5	5.99	54.5	0.69	40.0	0.00	0.0
Luxembourg	2.8	5.2	45.5	0.11	54.5	0.69	40.0	0.00	0.0
Austria	90.8	26.0	36.9	3.51	63.1	0.96	45.0	0.00	0.0
Finland	47.7	22.1	45.5	1.84	54.5	0.96	45.0	0.00	0.0
France	579.2	26.0	31.9	22.39	68.1	1.94	60.0	0.00	0.0
Belgium	109.6	26.0	29.9	4.23	70.1	2.64	62.5	0.00	0.0
Estonia	0.1	0.5	45.5	0.00	54.5	3.10	67.5	0.64	28.5
Slovakia	16.3	20.2	45.5	0.63	54.5	5.58	70.0	1.19	34.0
Ireland	56.4	20.5	45.5	2.18	54.5	6.05	75.0	2.10	45.0
Latvia	3.3	13.4	45.5	0.13	54.5	6.81	75.0	2.30	45.0
Lithuania	5.6	14.5	45.5	0.22	54.5	6.80	75.0	2.30	45.0
Malta	2.4	24.6	45.5	0.09	54.5	7.32	78.0	2.98	51.6
Slovenia	10.5	26.0	39.4	0.41	60.6	8.17	80.0	2.41	49.2
Spain	289.4	26.0	31.5	11.19	68.5	6.80	80.0	1.20	36.5
Italy	434.6	26.0	23.2	16.80	76.8	7.22	80.0	0.46	13.8
Portugal	48.1	26.0	36.1	1.86	63.9	11.80	85.0	3.54	58.5
Cyprus	2.9	16.0	45.5	0.11	54.5	16.07	87.5	7.40	72.5
Greece	26.0	14.8	45.5	1.00	54.5	35.19	95.0	13.95	89.0
Total portfolio	2587.1				64.0	3.69	60.6	0.50	10.1

Impact of E-bond proposal on marginal and average costs: example

Standard interest parity condition:

$$(1 + r)(1 - p) = (1 + r^*) - (1 - l)p$$

Where r = risky interest rate p = default probability, r^* = risk-free interest rate and l = loss given default.

Example : $r^* = 0.34\%$, $r = 1.82\%$. Assume $l = 0.5$. This implies $p = 2.9\%$.

Suppose risky rate refers to junior tranche of size s . Then, condition becomes:

$$(1 + r_s)(1 - p) = \begin{cases} (1 + r^*) & \text{for } l \geq s \\ (1 + r^*) - p(1 - l/s) & \text{for } l < s \end{cases}$$

For Italy, $s = 0.77$ in E-bond proposal (intermediary would only buy 23% of debt securities, because of ceiling of 26% of GDP). Implies $r_s = 2.27\%$. *Marginal cost of debt would increase by 45 basis points.*

But impact on *average* debt cost is unchanged. Assume intermediary can issue at 0.36% (just above safe interest rate). Then, new borrowing cost is:

$$0.77 * 2.27 + 0.23 * 0.36 = 1.83\%$$

Redistributive effects of E-bond proposal

Cause of redistribution: intermediary charges all borrowers the same interest rate (its funding cost), regardless of riskiness.

	Debt volume in portfolio (€billion)	Portfolio share (%)	Expected loss rates, interme- diary (%)	Expected losses caused (€billion)	Expected losses absorbed (€billion)	Expected transfer (>0 means recipient)
Germany	706.4	27.3	0.0	0.00	2.85	-2.85
Netherlands	155.0	6.0	0.0	0.00	0.62	-0.62
France	579.2	22.4	0.0	0.00	2.34	-2.34
Spain	289.4	11.2	1.0	2.80	1.17	1.64
Italy	434.6	16.8	0.4	1.67	1.75	-0.08
Portugal	48.1	1.9	2.8	1.33	0.19	1.13
Greece	26.0	1.0	13.3	3.47	0.10	3.36
Other countries	348.4	13.5	0.33	1.16	1.40	-0.25
Total or weighted average	2587.1	100.0	0.40	10.43	10.43	0.00

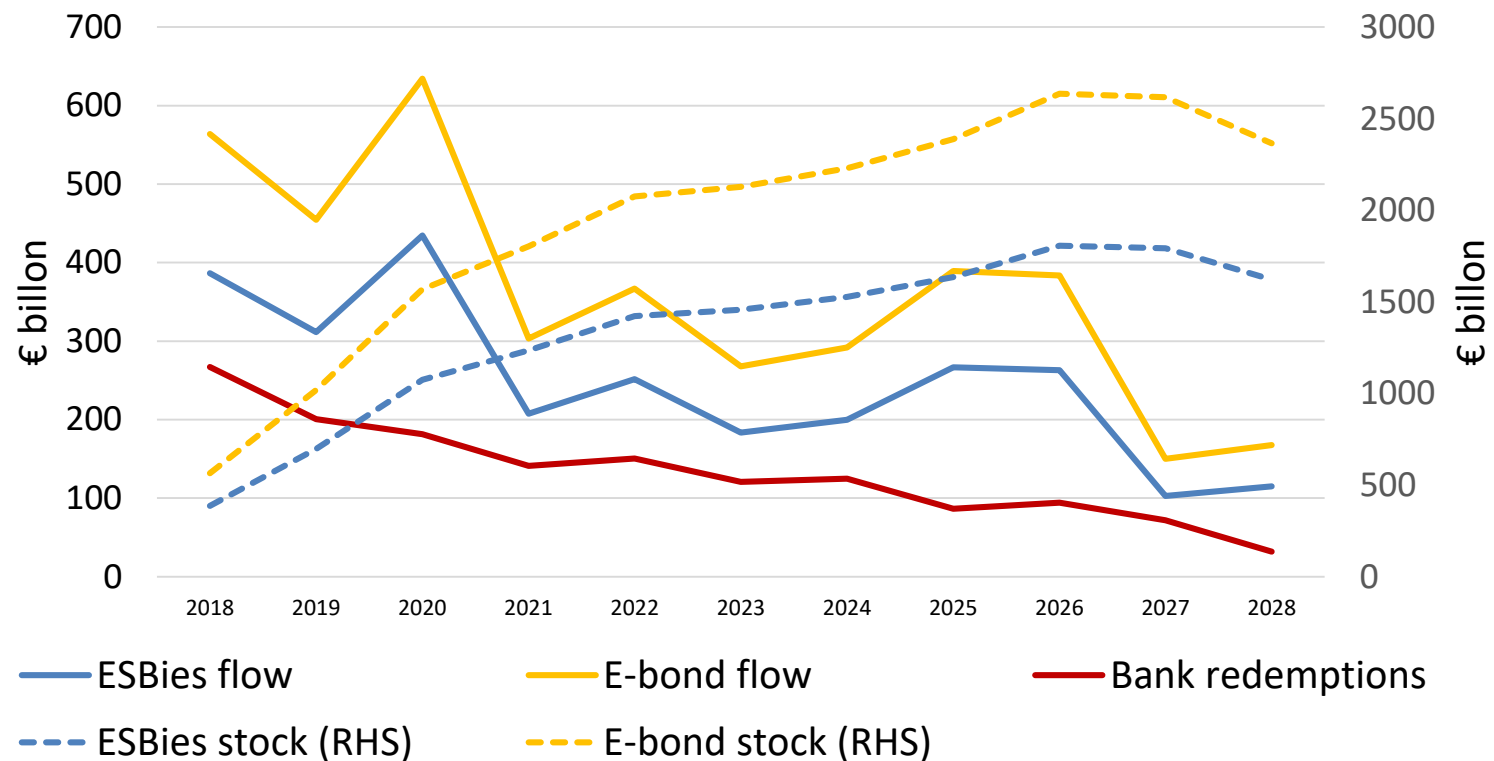
Total redistribution (sum of negative expected transfers across all countries):
€6.9 billion over 5 years \approx €1.4 billion per year < 1% of EU budget.

Engineering a smooth transition

1. Set up safe asset institution(s)/legal framework; test issuance.
2. Impose a regulatory penalty on Euro area bank holdings of newly issued sovereign debt. Penalty would *not* apply to
 - previously issued sovereign debt
 - the safe asset
3. Issue sufficient safe assets to match or exceed volume of bank-held maturing sovereign bonds *for all Euro area countries*
4. Continue until all national sovereign bonds owned by Euro area banks have matured and been replaced by the Euro area safe asset.

Illustrative transition path

Redemptions of bank-held sovereign bonds plotted against E-bond and ESBies issuance calibrated to generate demand for sovereign bonds equal to or exceeding bank redemptions



Note: Based on country maturity profiles from Bloomberg. Assumes that bank redemptions = total redemptions times share of country bonds held by Euro area banks.