



ESBies: Safety in the Tranches

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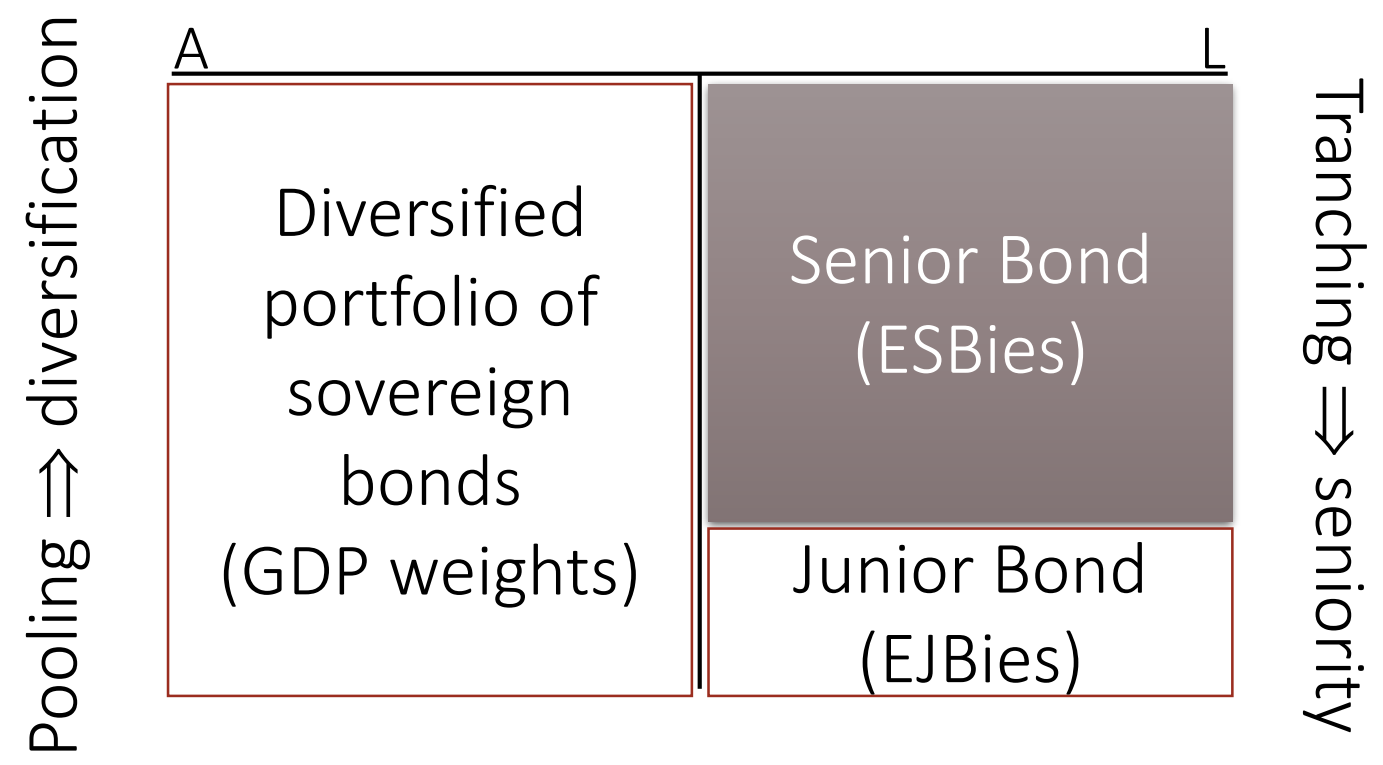
(joint with Markus Brunnermeier, Marco Pagano,
Ricardo Reis, Stijn Van Nieuwerburgh
and Dimitri Vayanos)

Economic Policy Panel

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European Senior Bonds (ESBies)

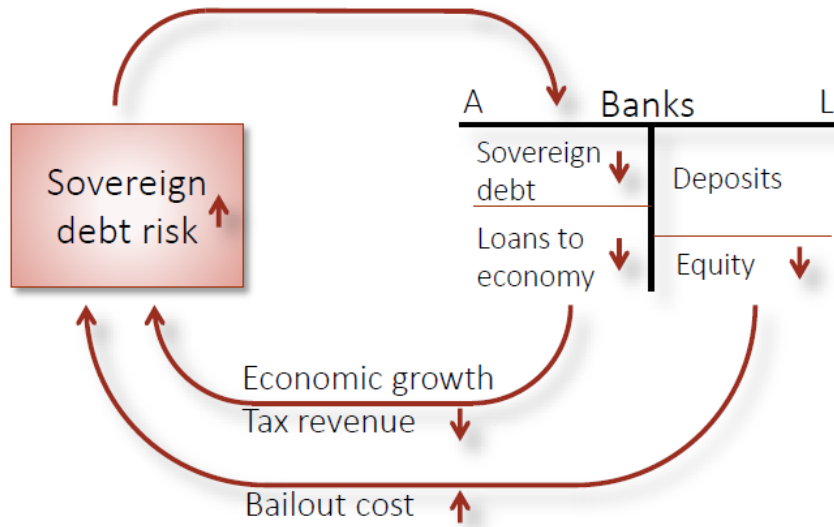
Illustrative face value:
60% of GDP



- Proposed by Euronomics (2011)
 - Brunnermeier, Garicano, Lane, Pagano, Reis, Santos, Van Nieuwerburgh & Vayanos

1. Motivation

1. Diabolic loop between sovereign & bank risk



Recent example of sovereign-bank loop



5-year default probabilities on Monte dei Paschi debt and Italian sovereign debt

1. Motivation

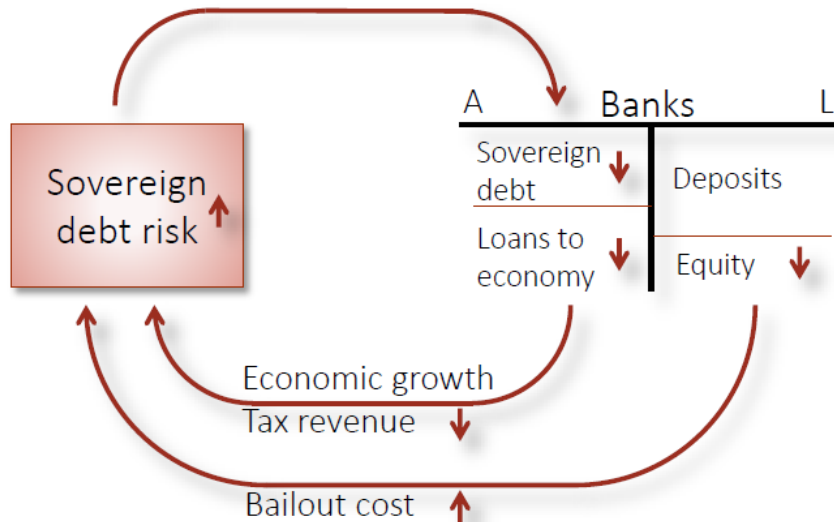
2. Cross-border flight to safety

- Price of German debt \uparrow
- Price of Italian/Spanish debt \downarrow



1. Motivation

1. Diabolic loop between sovereign & bank risk



→ weakened if **banks hold safe assets** (not sensitive to sovereign risk)

2. Cross-border flight to safety

- Price of German debt ↑
- Price of Italian/Spanish debt ↓



→ weakened if safe asset is **symmetrically supplied**

European political constraints

- No joint liability

- Fiscal mutualisation is *verboten*

- No EU treaty change

- Little political willingness for radical reform

→ ESBies

Outline

■ Simulation:

- How safe are ESBies (expected loss)?
- By how much would they increase safe asset supply (safety = AAA-rated = 0.5% EL)?

■ Theory:

- Would ESBies affect sovereign default probabilities?

■ Implementation:

- How to create ESBies in practice?

2. Simulations

- 10 million draws in 2 stages:
 - Stage 1: draw macro states
 - 5% crisis state
 - 25% mild recession
 - 70% normal state
 - Stage 2: draw defaults
 - state-dependent PD distributions

Table 1: Simulation inputs

	(1) Rating	(2) Debt/GDP	(3) Weight	(4) pd1	(5) pd2	(6) pd3	(7) lgd1
Germany	1	71	28.16	5	0.5	0	40
Netherlands	1	65	6.61	10	1	0	40
Luxembourg	1	21	0.18	10	1	0	40
Austria	1.5	86	3.21	15	2	0	45
Finland	1.5	63	2.02	15	2	0	45
France	3	96	21.25	25	3	0.05	60
Belgium	3.5	106	3.93	30	4	0.1	62.5
Estonia	4.5	10	0.03	35	5	0.1	67.5
Slovakia	5	53	0.66	35	6	0.1	70
Ireland	6.5	94	1.80	40	6	0.12	75
Latvia	7	36	0.17	50	10	0.3	75
Lithuania	7	43	0.25	50	10	0.3	75
Malta	7.5	64	0.07	55	11	0.4	78
Slovenia	9	83	0.37	60	15	0.4	80
Spain	9	99	10.77	60	15	0.4	80
Italy	9.5	133	16.52	65	18	0.5	80
Portugal	12	129	1.77	70	30	2.5	85
Cyprus	13.5	109	0.19	75	40	10	87.5
Greece	19	177	2.01	95	75	45	95
Average	4.58	91		31.30	8.07	1.12	59.47

- Benchmark scenario: calibrated to end-2015 CDS spreads
- Adverse scenarios: more severe PD distributions, correlations

Securities to compare

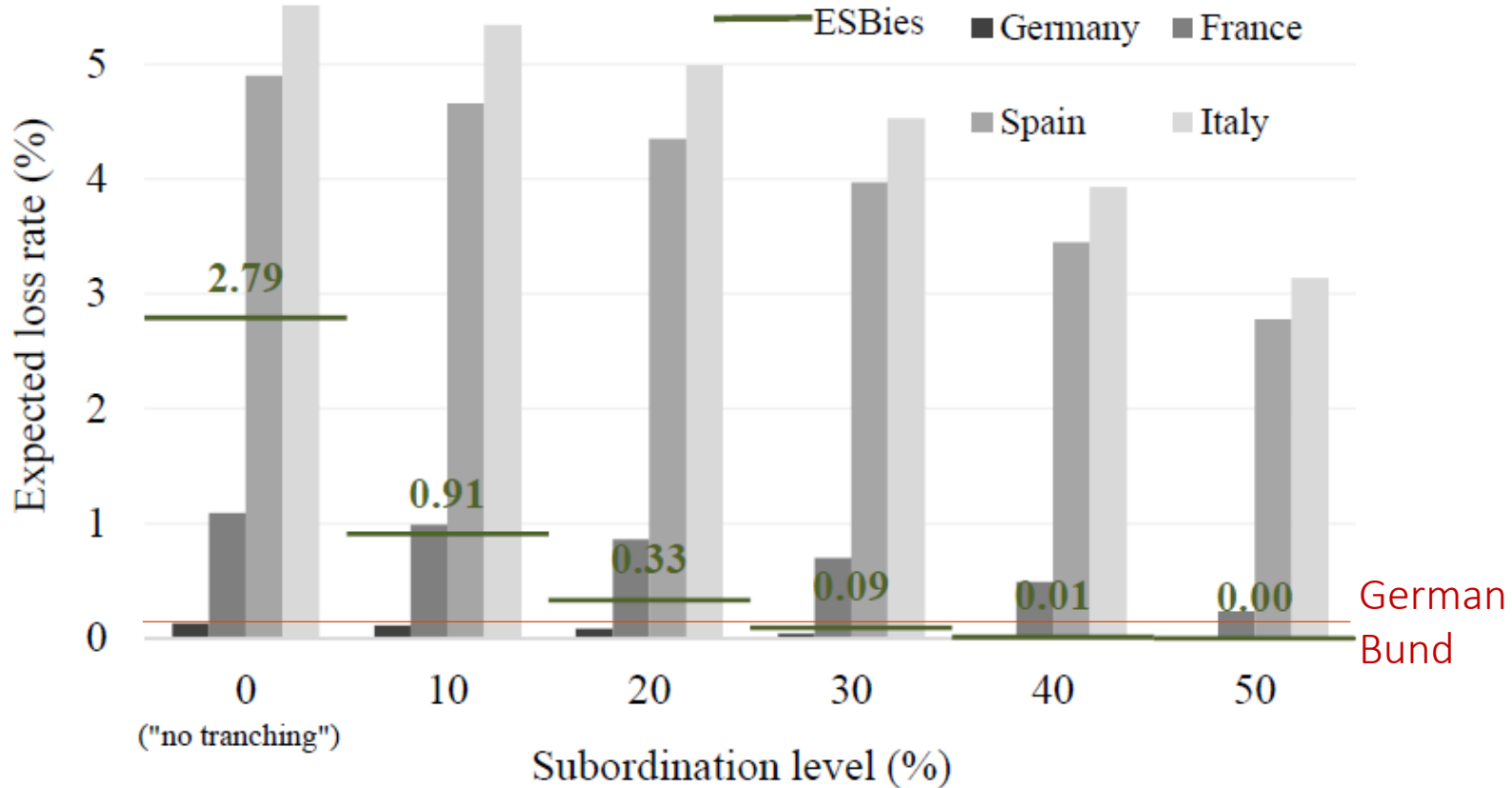
- **Status quo** national sovereign bonds
- **Pure pooling** (without tranching)
- **National tranching** (without pooling)
- **ESBies** (pooling and tranching)

5-year expected loss rates *status quo vs pure pooling*



5-year expected loss rates: senior tranche

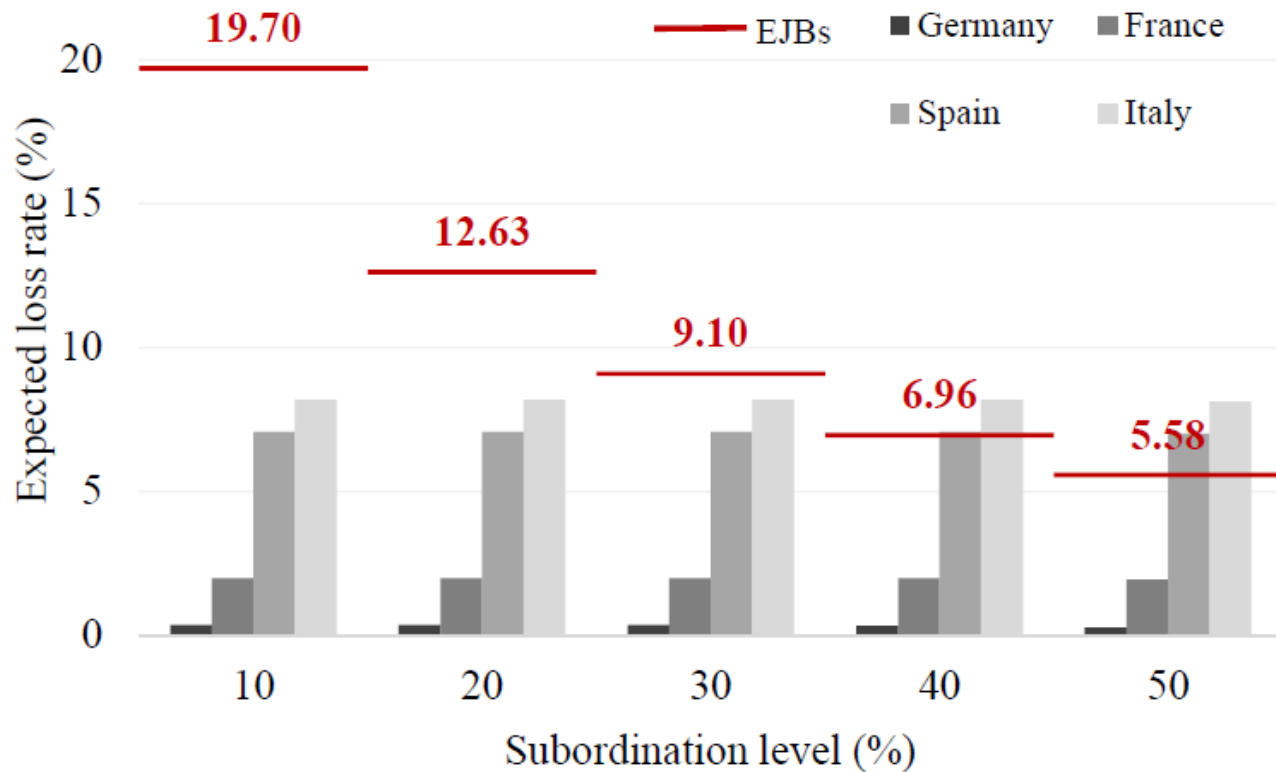
Senior tranches' five-year expected loss rates by subordination level



ESBies benefit from tranching more than national sovereign debt

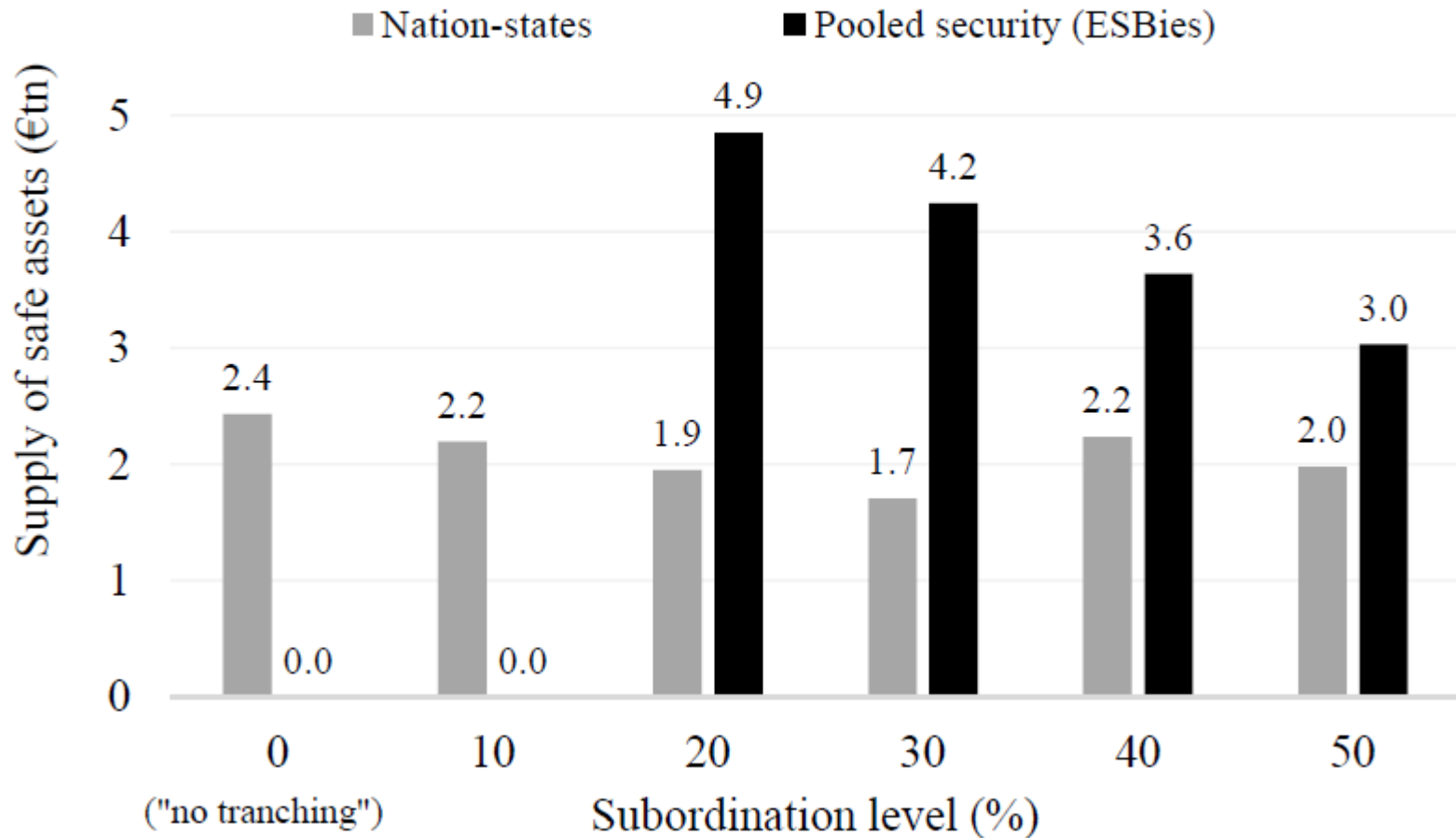
5-year expected loss rates: junior tranches

Junior tranches' five-year expected loss rates by subordination level



EJBies with 30% subordination compare with Portugal (8.97%), basket of IT, PT, CY, GR (9.32%)

Supply of safety assets



3. Can ESBies weaken the diabolic loop?

- So far, MM neutrality
 - ESBies just reallocate risk, do not reduce it
 - In the simulations all correlations were taken as given
- But if banks held (some) ESBies, they would be less vulnerable to domestic sovereign repricing
 - ⇒ the probability of a diabolic loop would fall
- To see this, model the diabolic loop

Model ingredients

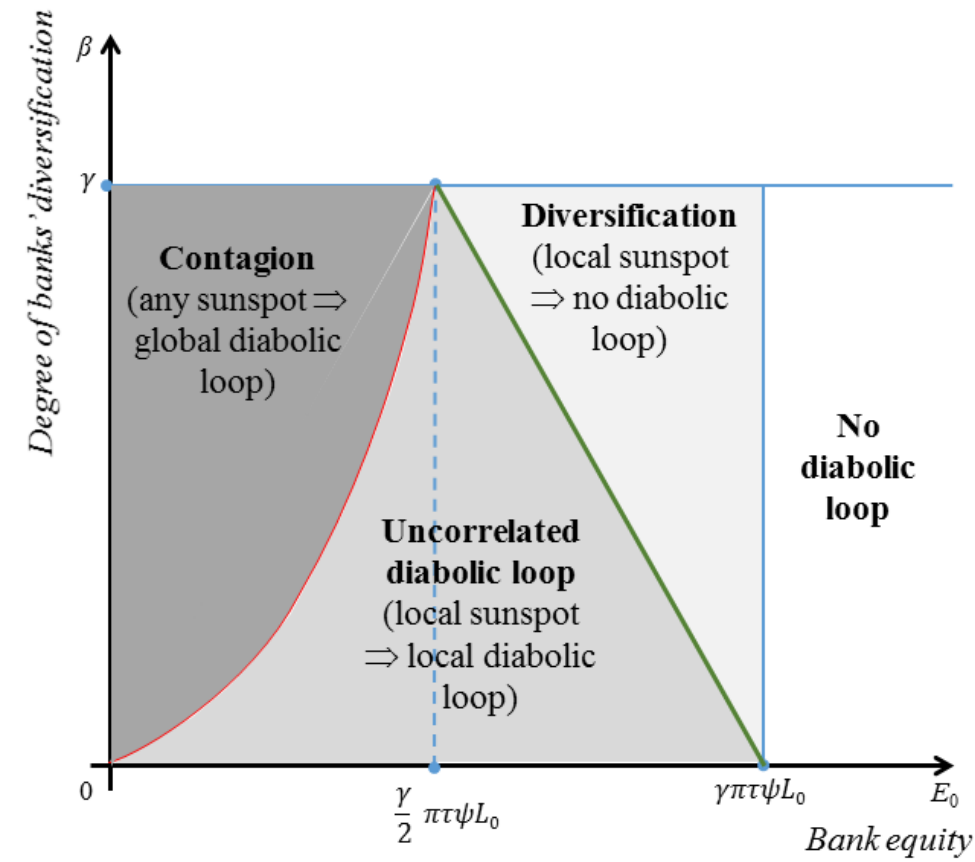
- Two symmetric countries
- $t = 0$: Banks endowed with fraction α domestic sovereign debt and β of a pooled security formed by a 50-50 mix of both countries
- $t = 1$: Probabilistic sunspot in each country causes sovereign debt repricing for certain parameter values
- $t = 2$: government bails out banks if they are insolvent \rightarrow diabolic loop

Key parameters:

- Higher equity (E_0) improves bank resilience
- More portfolio diversification (β):
 - reduces sensitivity of bank equity value to domestic sovereign
 - increases sensitivity to foreign sovereign
- More subordination ($1-f$) shrinks region (E_0, β) with diabolic loop

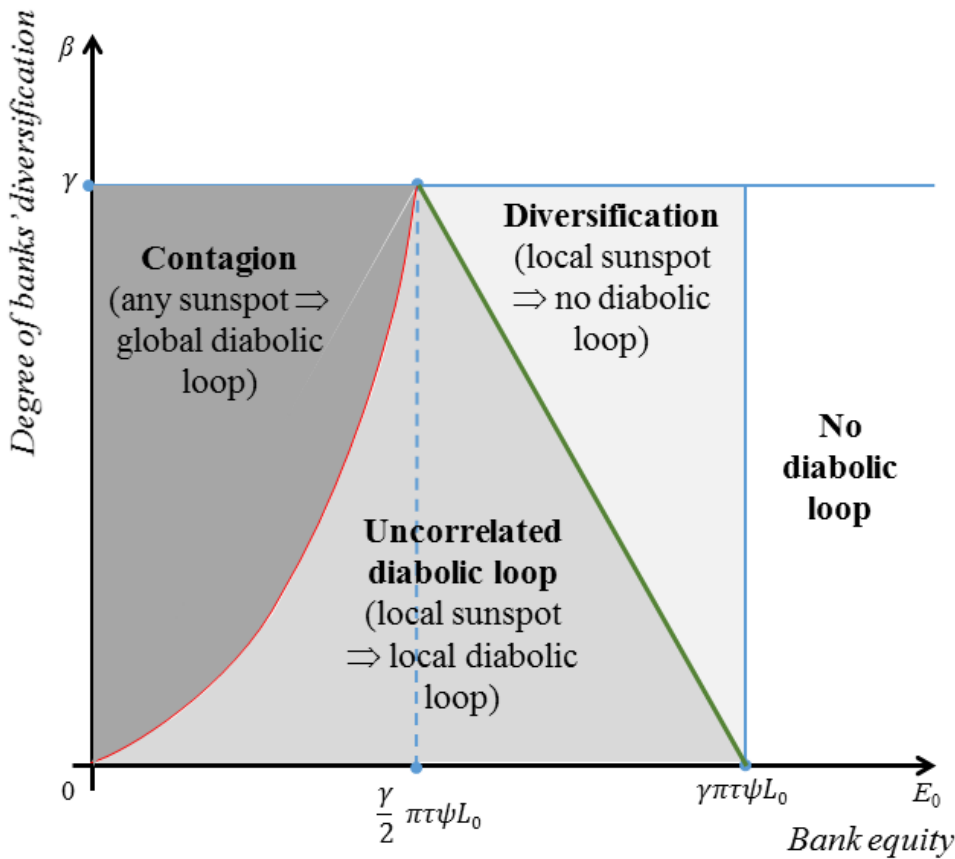
Parameter regions

No tranching

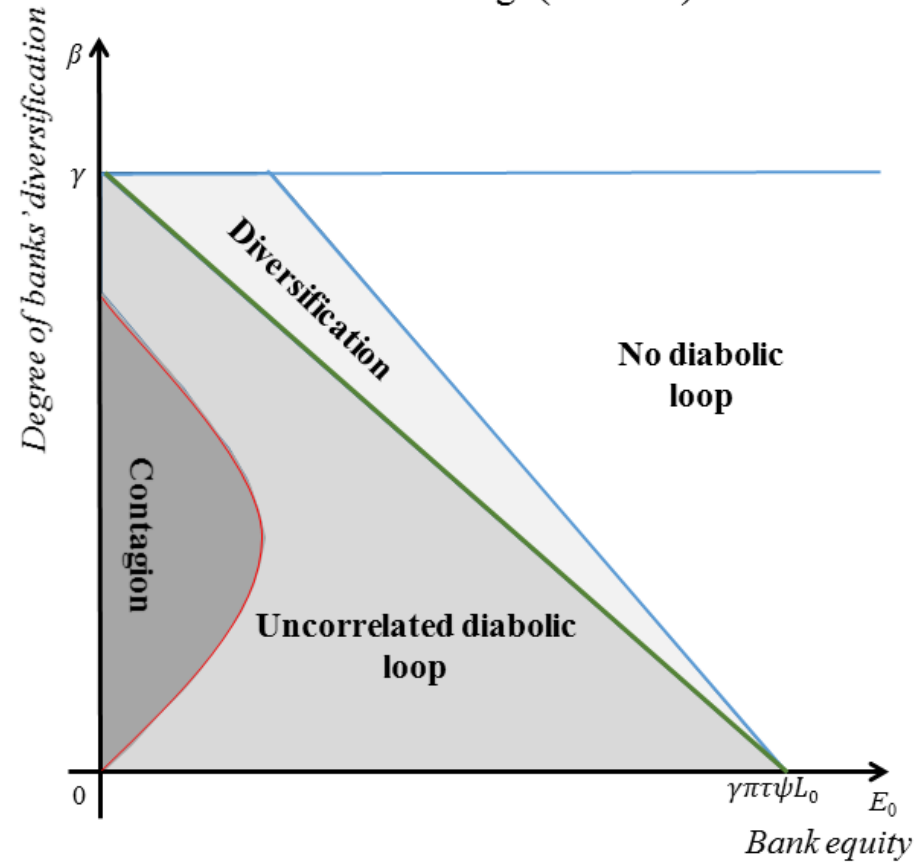


Parameter regions

No tranching



Tranching (ESBies)



Intuition:

tranching shifts default risk to junior bond holders outside of banks

How to dig the trenches?



Implementation

What?

security design

Who?

buyers and sellers

How?

regulation and market microstructure

When?

sequencing of market creation

What?

Underlying portfolio

- All euro area nation-states' government debt
 - general government: includes central, state, local (à la Maastricht Treaty)
 - opt-in for other EU member states (à la SSM)
 - possible temporary exclusion if price discovery not guaranteed (?)
- Weighted by slow-moving GDP shares
 - 5-year moving average
 - Alternatively: ECB capital key
- Weight adjustment for low national debt stocks (Estonia, etc)
 - retain active secondary market for national debt
 - constrain ESB issuers to buy up no more than $k\%$ of a nation-state's debt stock by adjusting weights
 - in ECB QE, $k=33\%$, but k could be set higher to minimise weight adjustments
 - important that $k < 100\%$ to retain price signal

Who?

Buyers of ESBies

- Who would buy ESBies?
 - Banks
 - Other financial institutions in need of collateral (e.g. for derivatives)
 - Others in need of safe stores of value (e.g. CCPs)
 - Eurosystem (for non-standard measures)

Who?

Buyers of EJBies

- Who would buy EJBies?
 - Highly liquid
 - About as risky as Portuguese bonds
 - Safer than implied by Modigliani-Miller (endogenous risk reduction)
 - Investor base: investment funds, insurers
- Main attraction: embedded leverage
 - EJBies allow investors to attain greater exposure to sovereign debt for the same quantum of external funding
 - Additional exposure implicitly financed at the safe rate of ESBies
 - To achieve same exposure with balance sheet leverage, build sovereign portfolio financed by 70% debt, 30% equity
 - Debt priced at the marginal cost of external funding

Who?

Issuers of ESBies and EJBies

Feasible options:

- Public or private – or both
 - Public:
 - Political interference (strong governance)
 - Legal change
 - Private:
 - Counterparty credit risk (bankruptcy remote securitization vehicle)
 - Counterparty moral hazard (transparency; supervision)
 - Legal risk (issuance under same jurisdiction)
 - Compensation (fees)

How?

ESBies' Handbook

Standard-setting:

- Homogenise ESBies
 - Standard security design: portfolio, tranching

Enforcement:

- Certify ESBies' issuers
- Grant security license numbers (ISINs) to ESBies

How?

Interaction with sovereign debt markets

- ESBies-issuers could buy on primary and secondary markets
- Price discovery continues to take place on both markets
- Issuers' job in primary markets easier with more DMO coordination...
 - timing of issues
 - diversity of characteristics (maturity, coupon, etc)
- ...but full coordination is unnecessary to reduce warehousing risk
 - to be announced (TBA) securitisation
 - time tranching
 - buy on secondary markets

When?

- Phase 0: Define ESBies' regulatory treatment
 - Monetary policy, prudential regulation (look-through principle)
- Phase 1: Limited experimentation (“prototype”)
 - Small volume issuance
- Phase 2: Auction swap
 - Large-scale swap using auction mechanism
- Phase 3: Reform treatment of national debt
 - Risk-based or concentration-based capital charges on banks' national holdings
 - Look-through principle

Conclusions

- For given PDs and LGDs, ESBies would
 - be at least as **safe** as German Bunds
 - **double the supply** of euro safe assets
- If banks replaced domestic sovereign debt holdings with ESBies, they would **weaken the bank-sovereign loop**
- ESBies are **feasible**:
 - Politically (no mutualisation)
 - Technically