Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC-National Bank of Belgium Workshop on "*Data needs and Statistics compilation for macroprudential analysis*"

Brussels, Belgium, 18-19 May 2017

What 'special purposes' make Ireland attractive for debt funding by international banks?[1]

Brian Golden and Eduardo Maqui,
Central Bank of Ireland

[1] This presentation was prepared for the meeting. The views expressed are those of the authors and do not necessarily reflect the views of the BIS, the IFC or the central banks and other institutions represented at the meeting.

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Eurosystem

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Brian Golden[Ψ]
Eduardo Maqui[Ψ]

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Workshop on "Data needs and Statistics compilation for macroprudential analysis"

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Outline

Context

Mapping

- The whole SPE reporting population
- Specific sponsor bank-linked SPEs
- Typical business models employed by sponsor banks

Initial research

- Motivation
- Research goal and data
- Empirical strategy I: Bivariate Probit model
- Empirical strategy II: Tobit model
- Empirical strategy III: OLS model

Conclusions

Context

- **Global market finance growth** $\longrightarrow$ Non-banks step up debt issuance as banks retrench (IMF, 2016);

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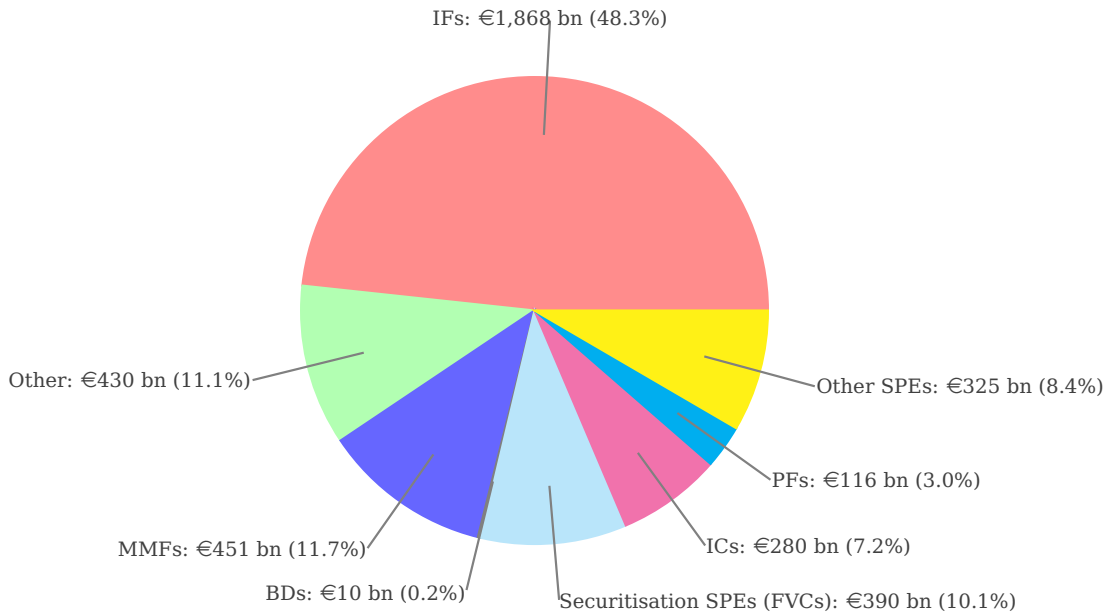

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  1. Over 1,600 vehicles covering **total assets** of **€715 bn**;
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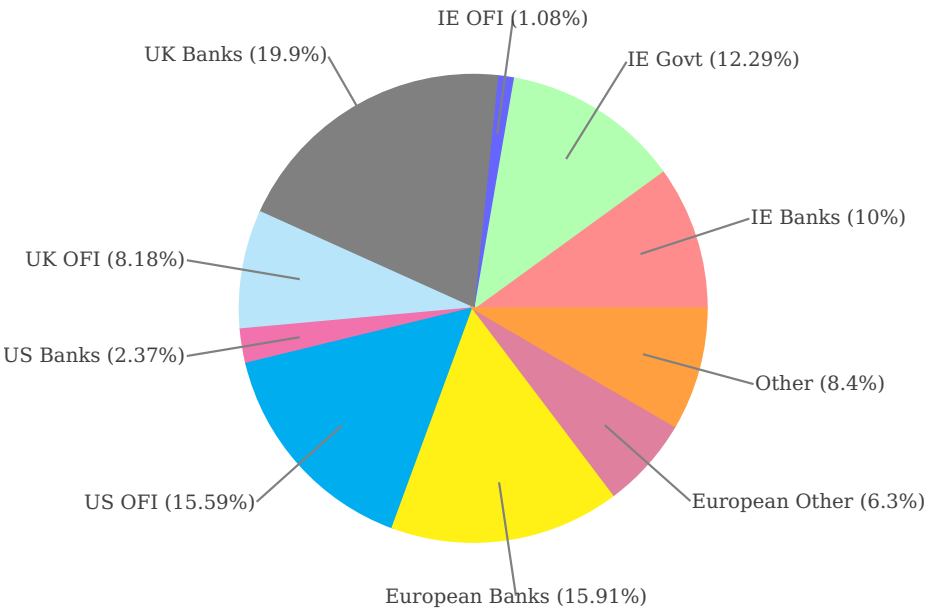
  3. Potential for **original research**.

Mapping SPEs

- Sponsor profile of securitisation SPEs (FVCs)



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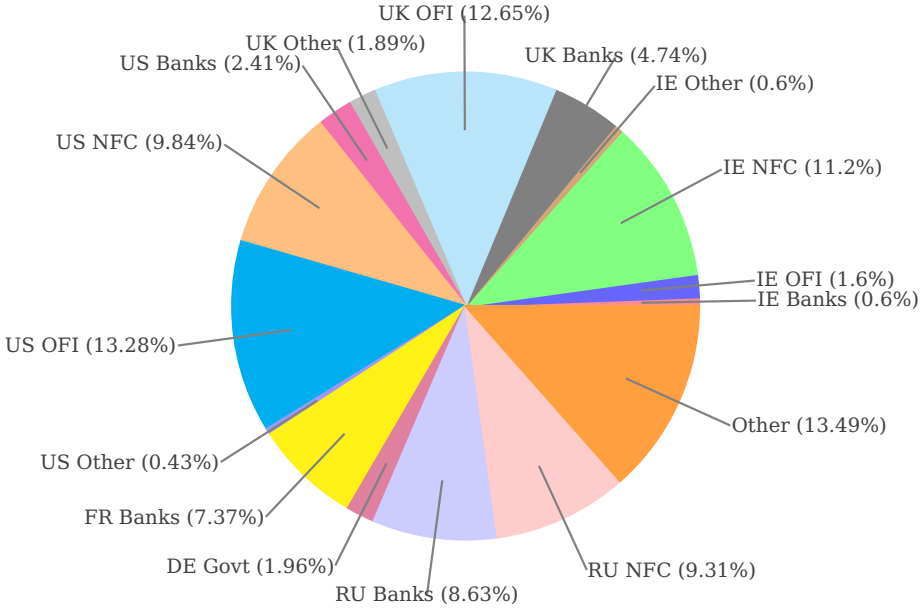

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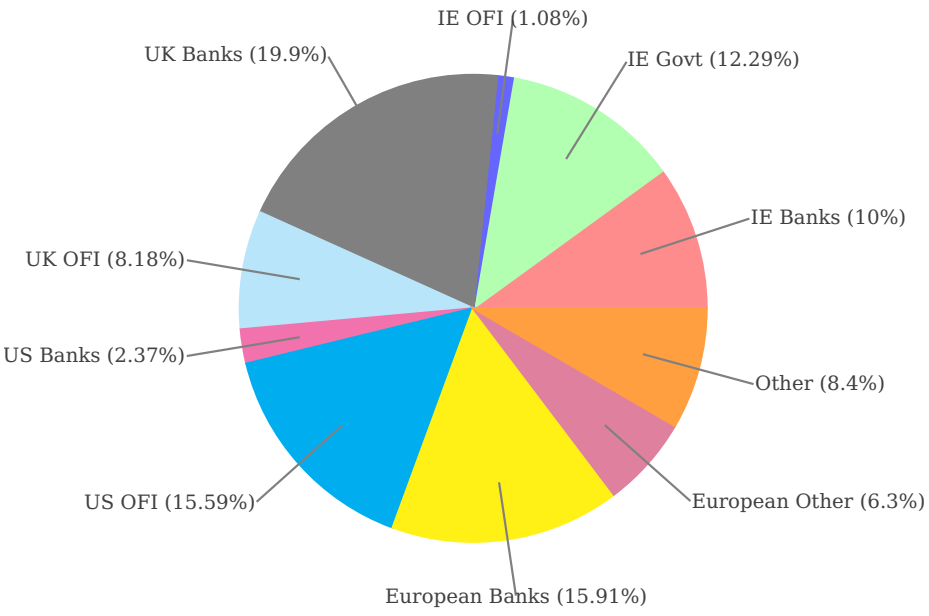

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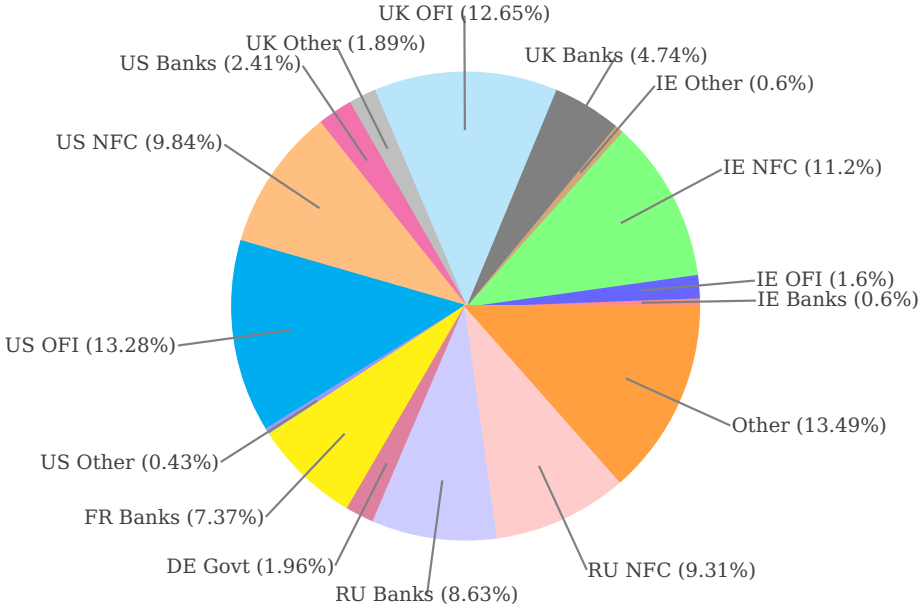

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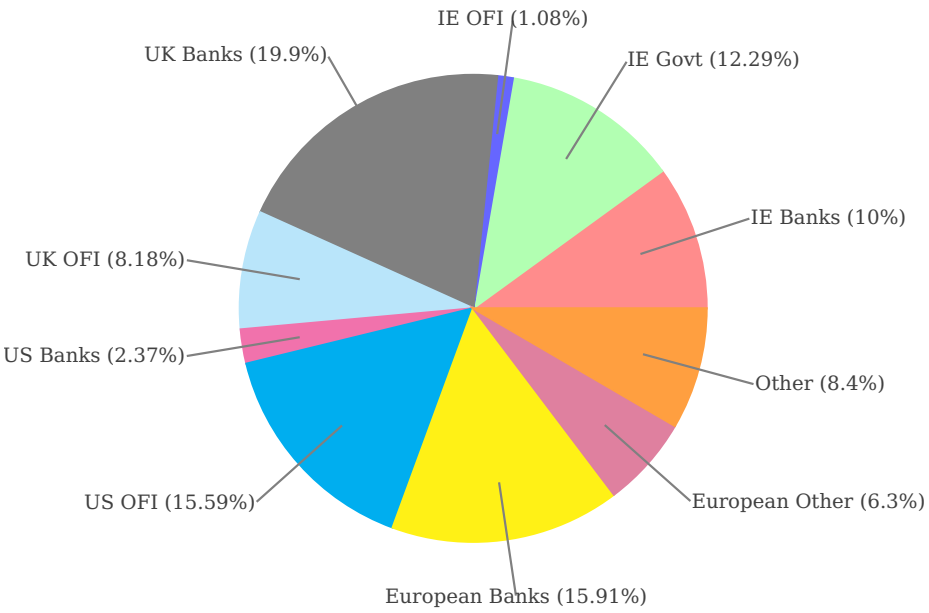

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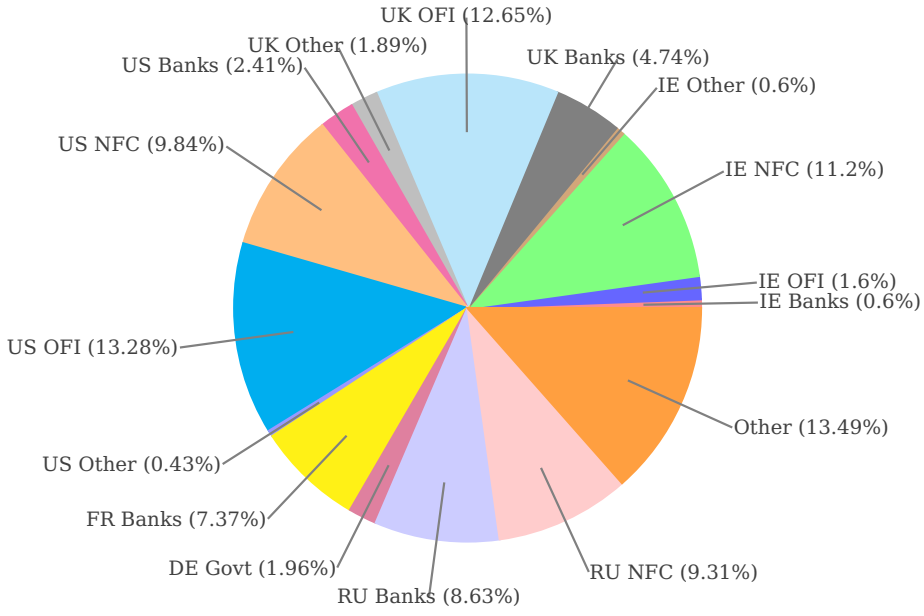

- Wide range of sector and country links, with cluster effects;
- **Other vehicles** → 14 different activity types (fund-linked investment, intra-group financing and external financing accounting for 70%).

Mapping bank-sponsored SPEs

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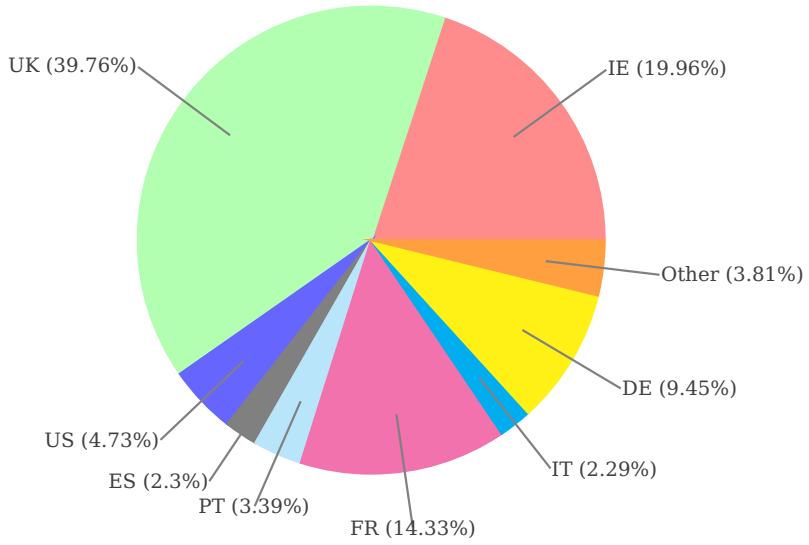

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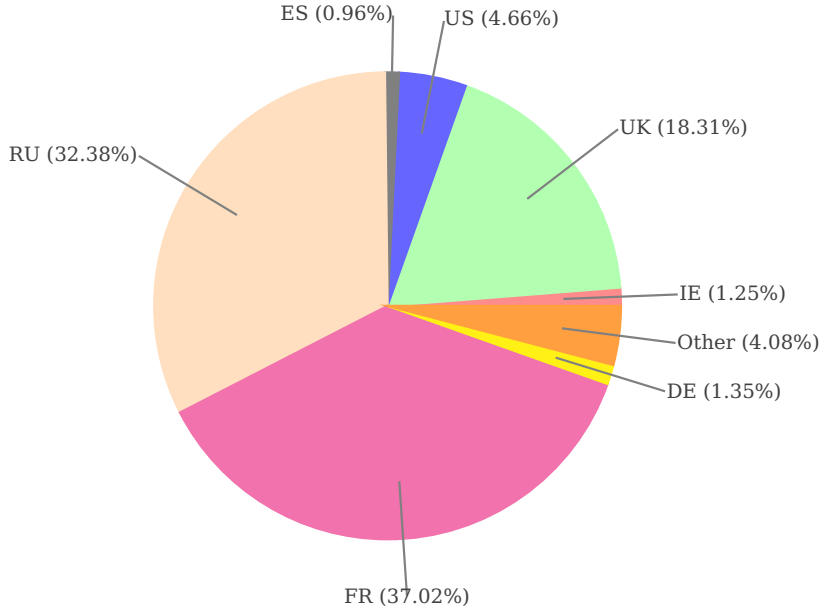

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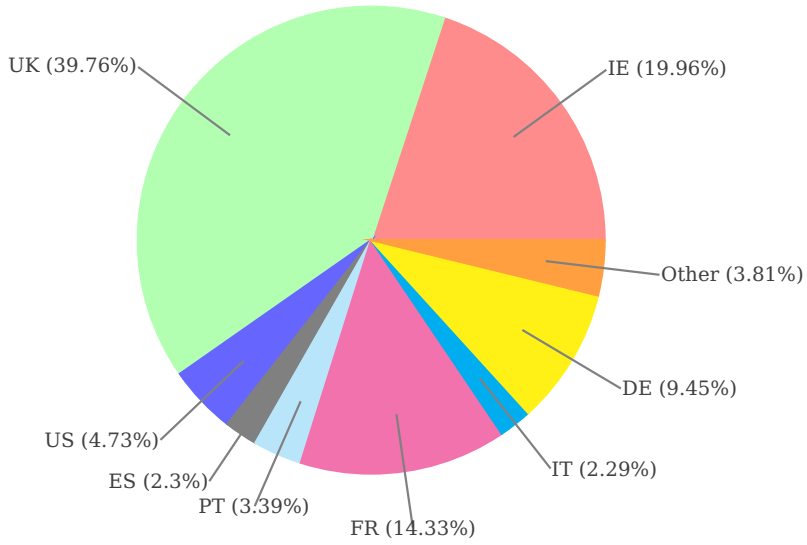

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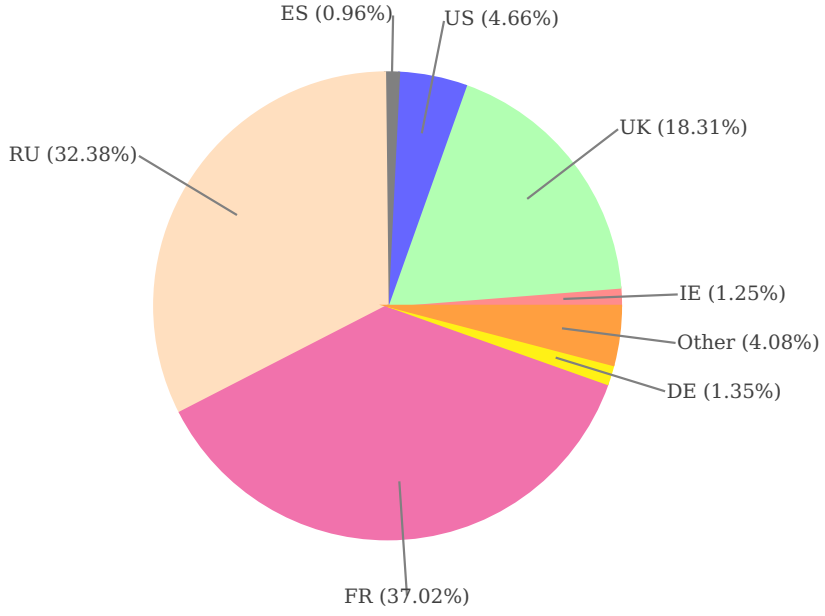

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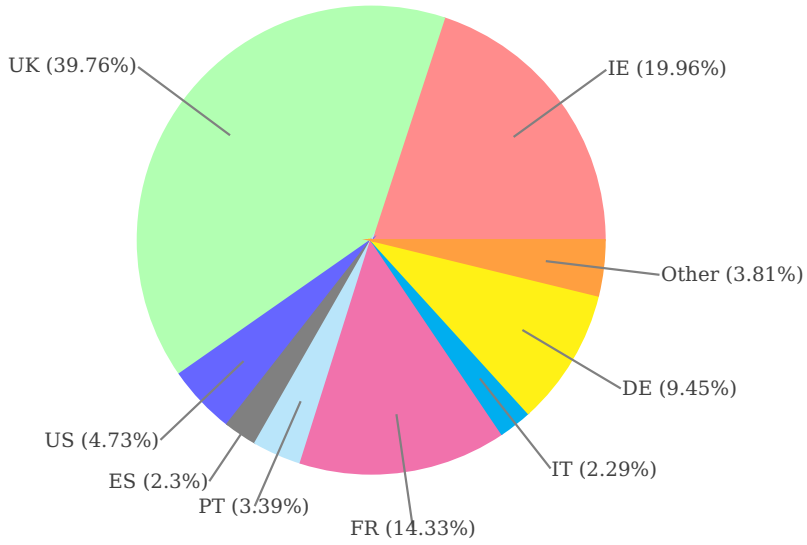

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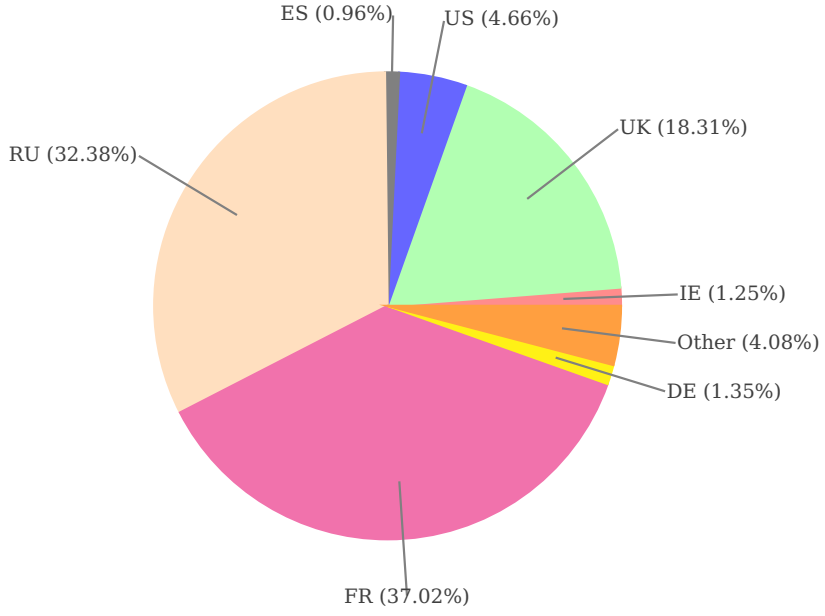

- **Securitisation vehicles** → Variety of links, with Western European cluster;
- **Other vehicles** → Less regional focus given the range of activities, but each country segment represents one to two activity types.

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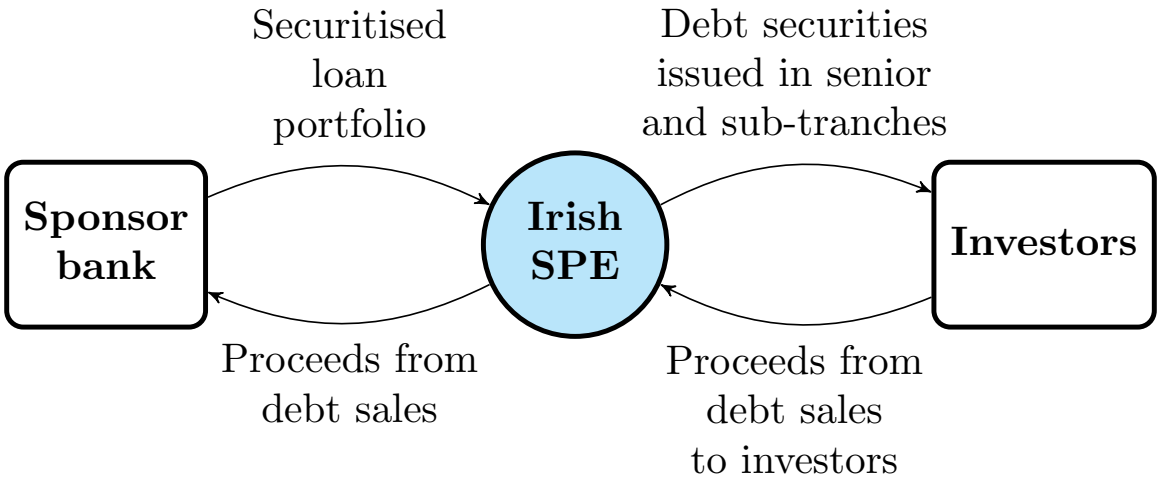

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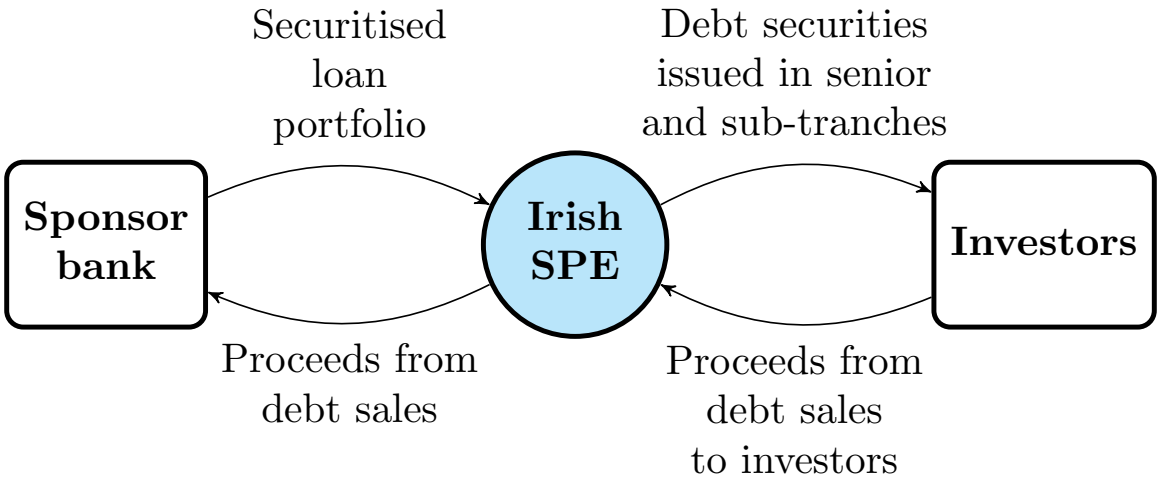

- Sponsor bank passes on the credit risk of loans to investors, reducing loans on the balance sheet while it earns servicing fee income.

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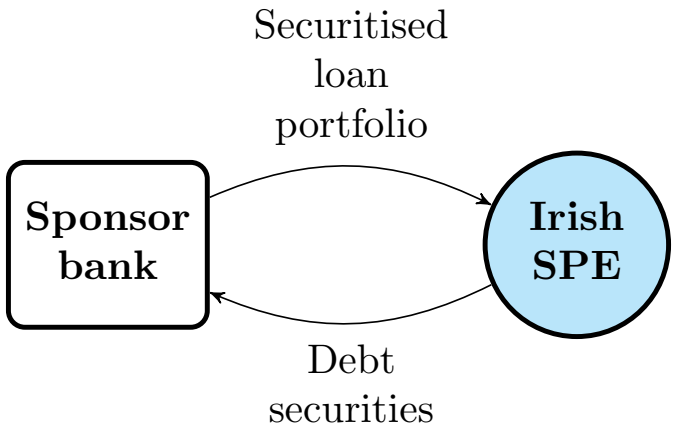

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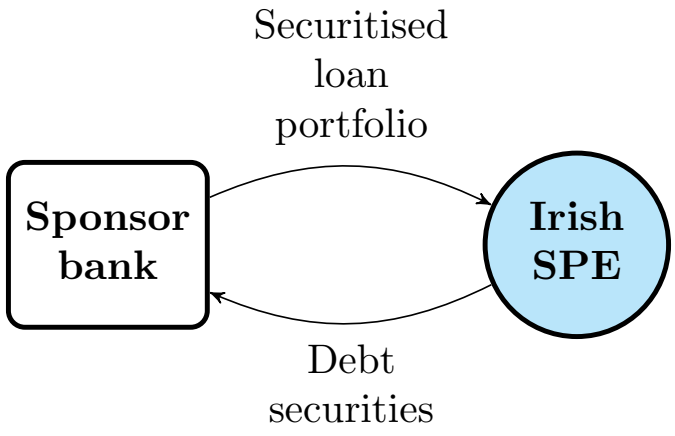

- Sponsor bank uses the debt securities as collateral to access central bank liquidity facilities.

Asset-backed debt issuance

Debt securities held by SPE with returns split between sponsor bank and investors

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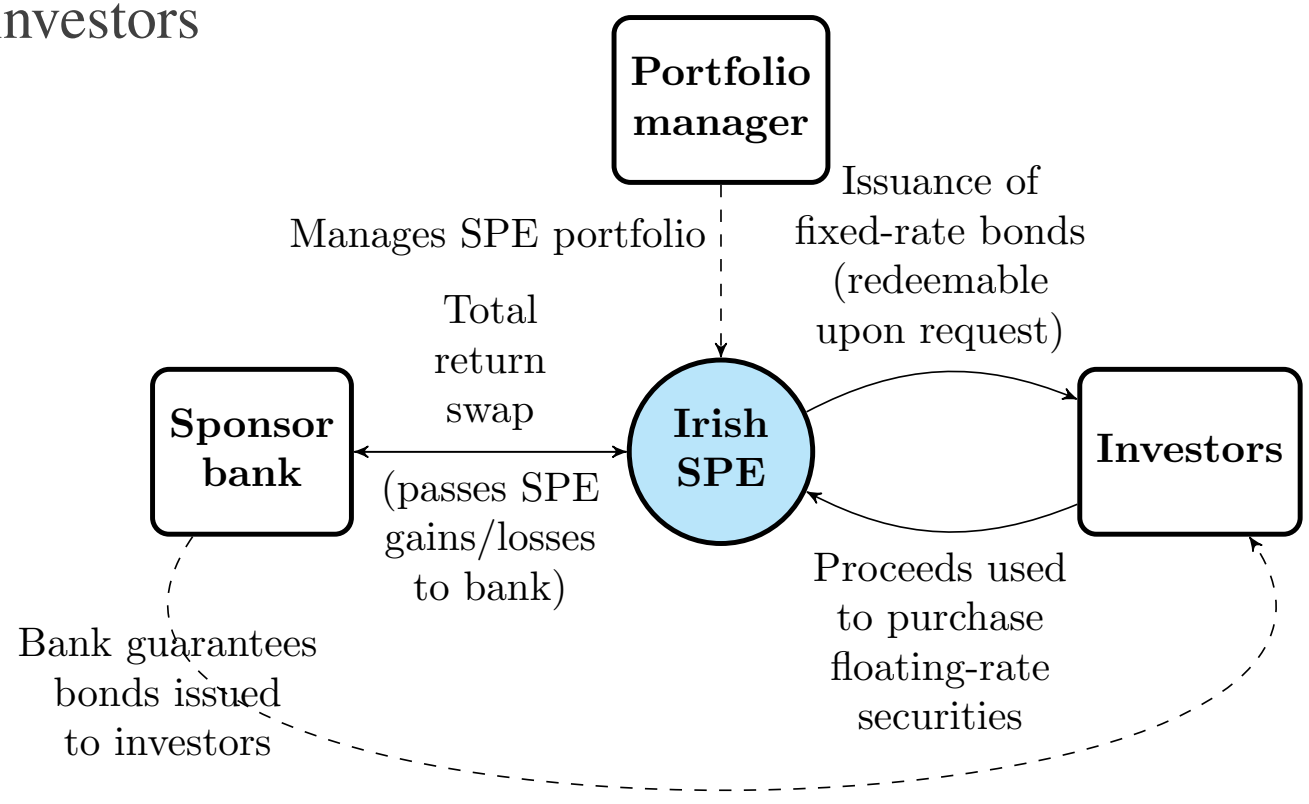

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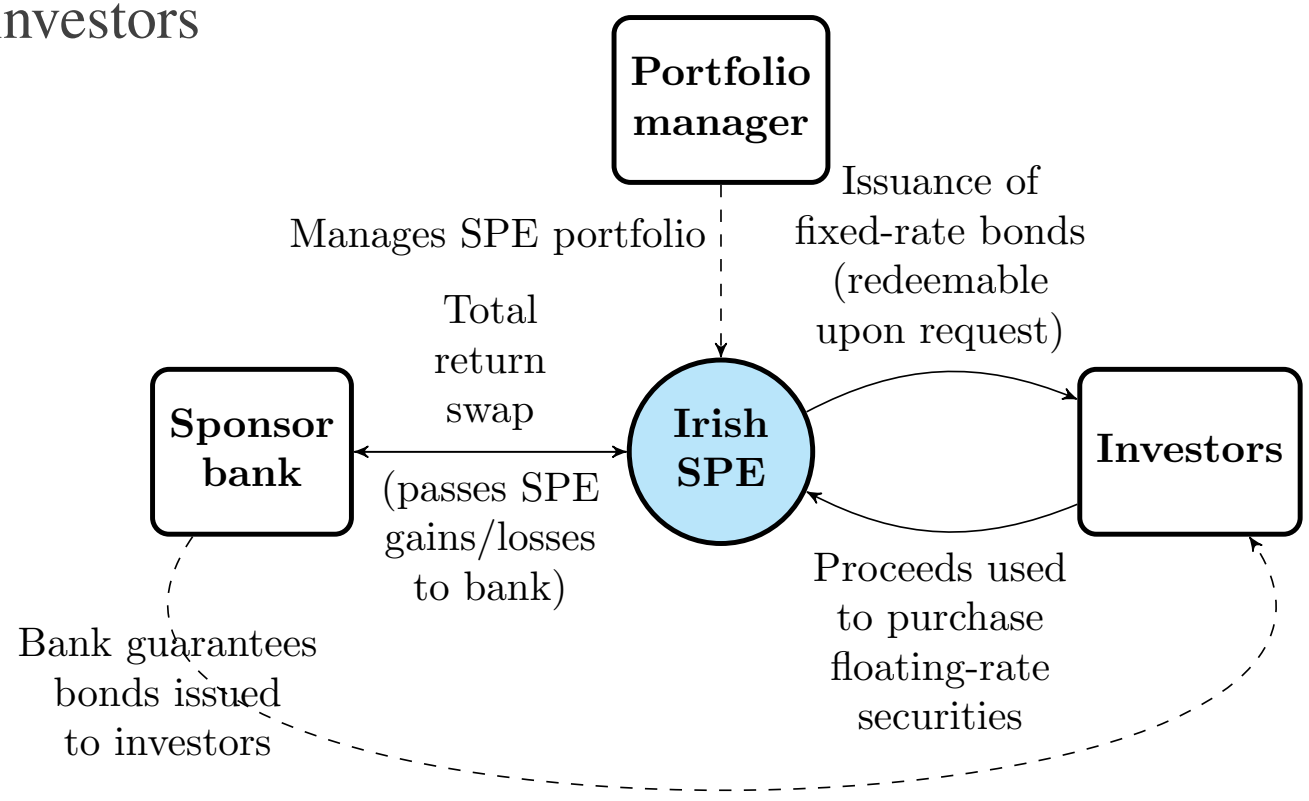

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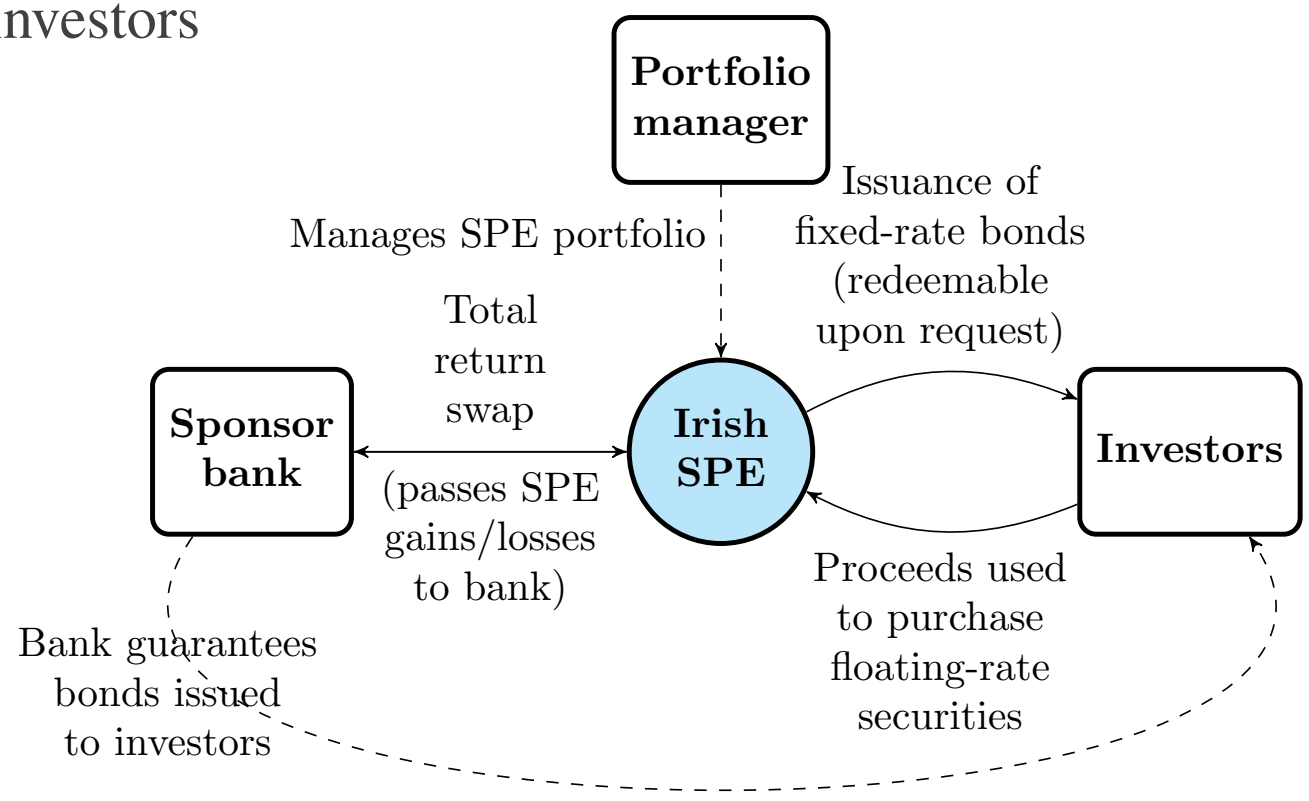

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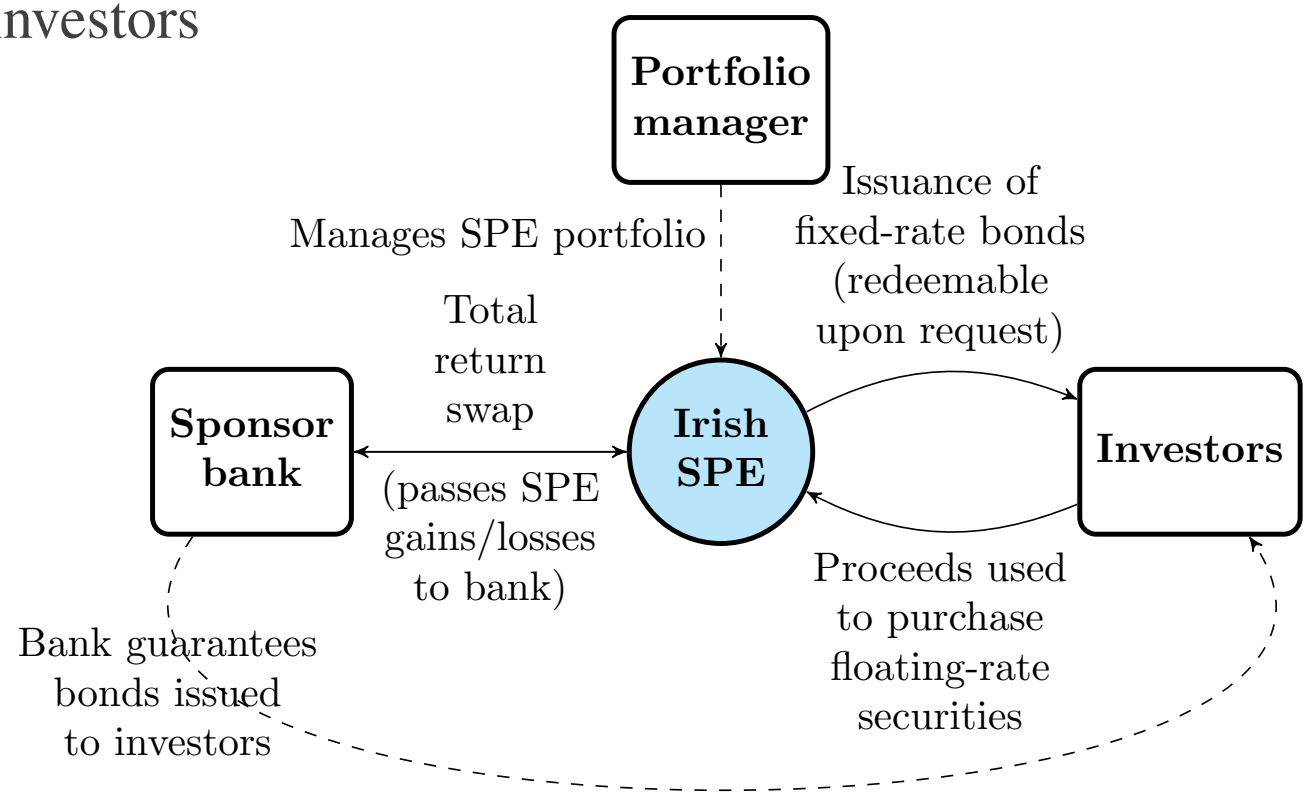

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- **Motivations**: Interest rate risk, maturity transformation and accessing cash flows to finance investments;
- **Open questions**: Where sponsor bank or investors run consistent losses and we do not see the full vehicle structure.

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Sponsor bank places collateral into Irish SPE

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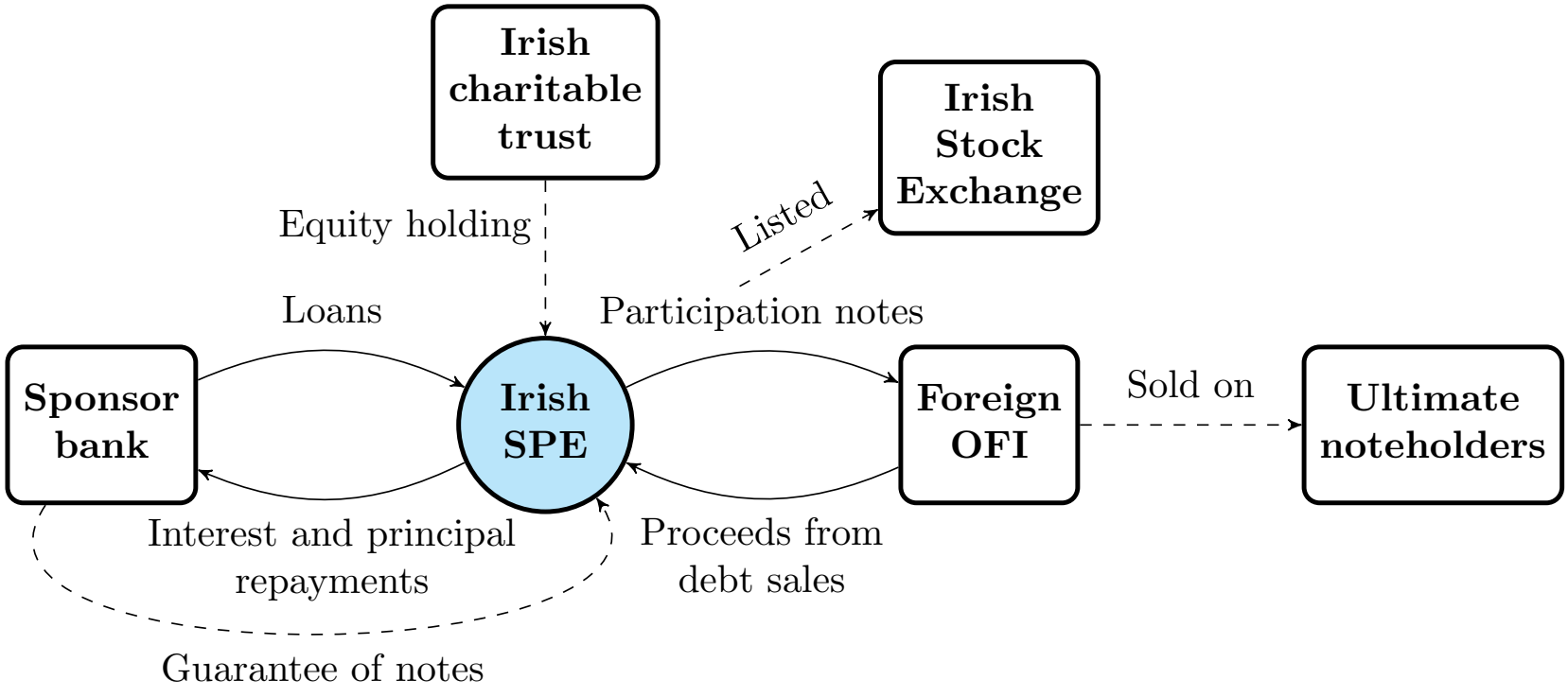

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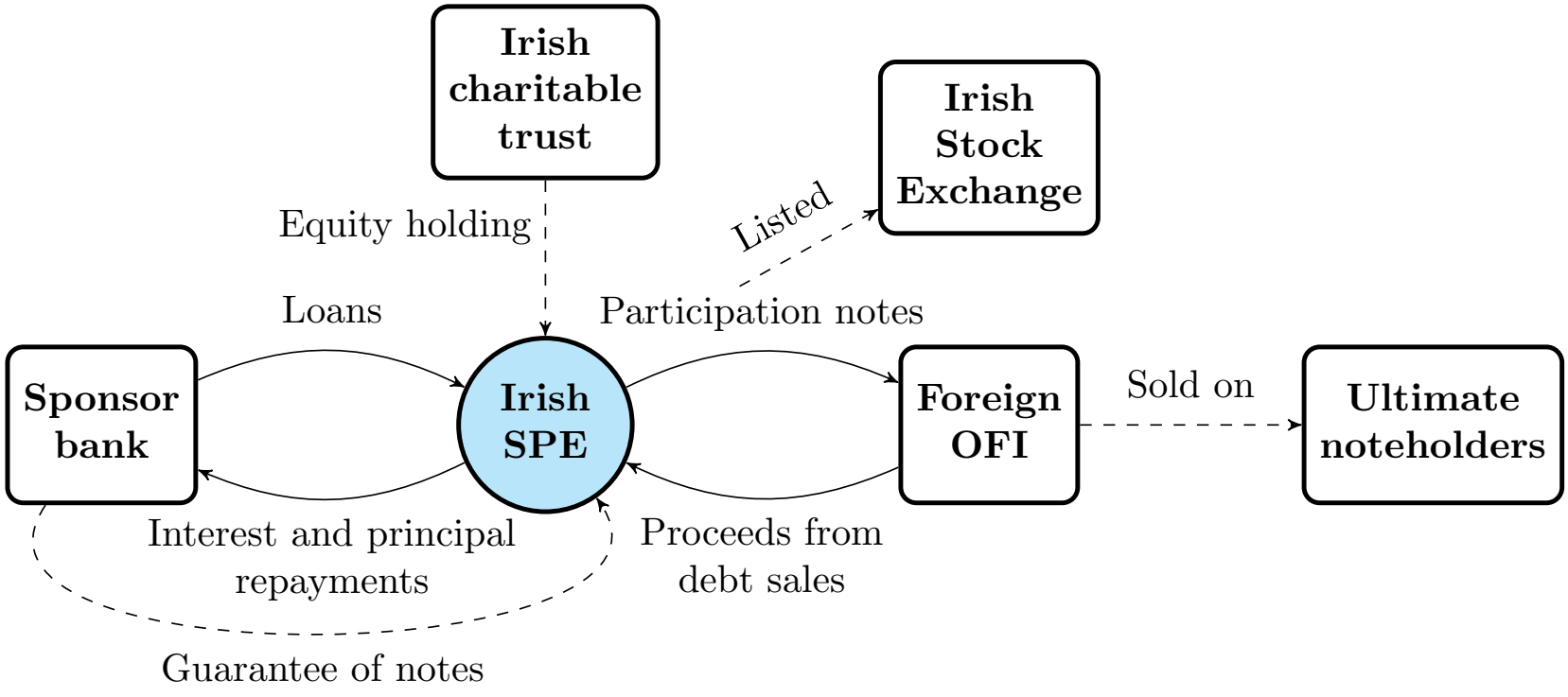

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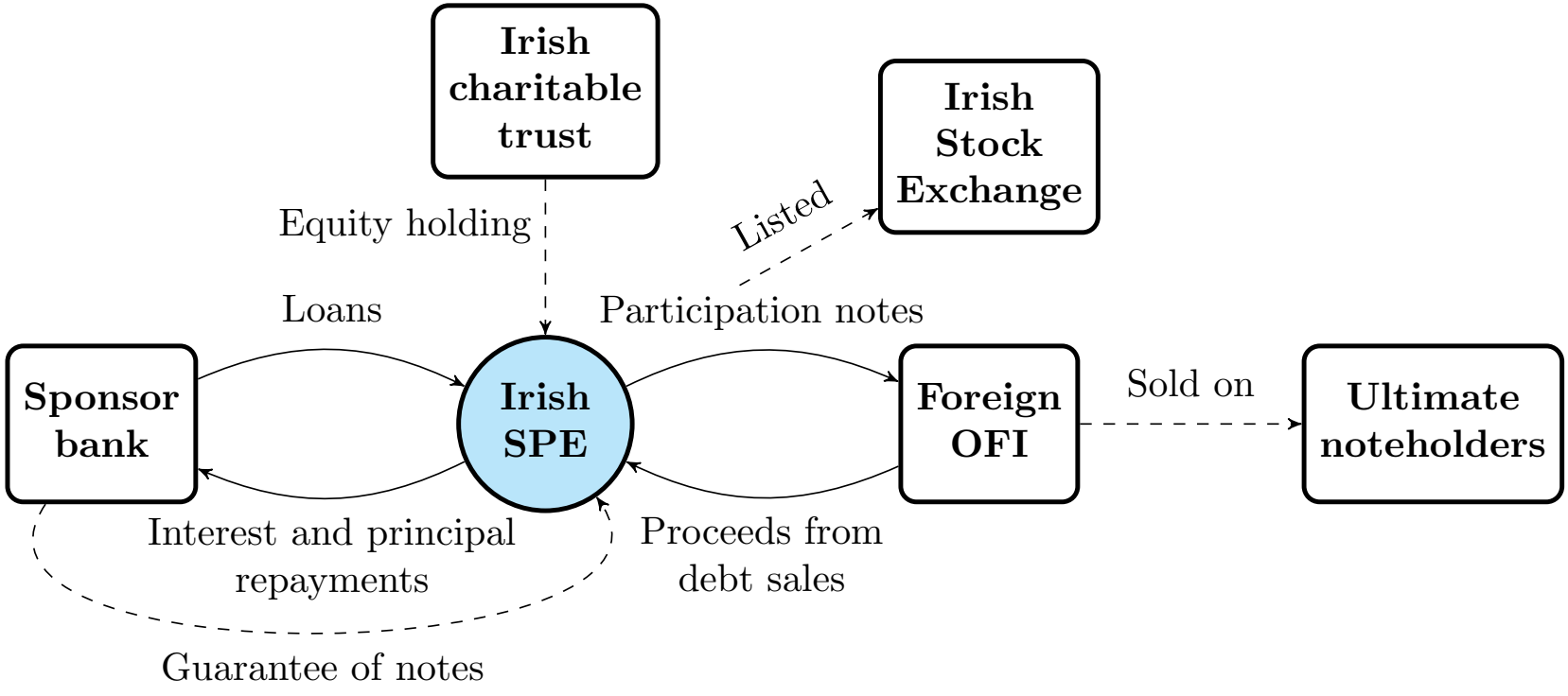

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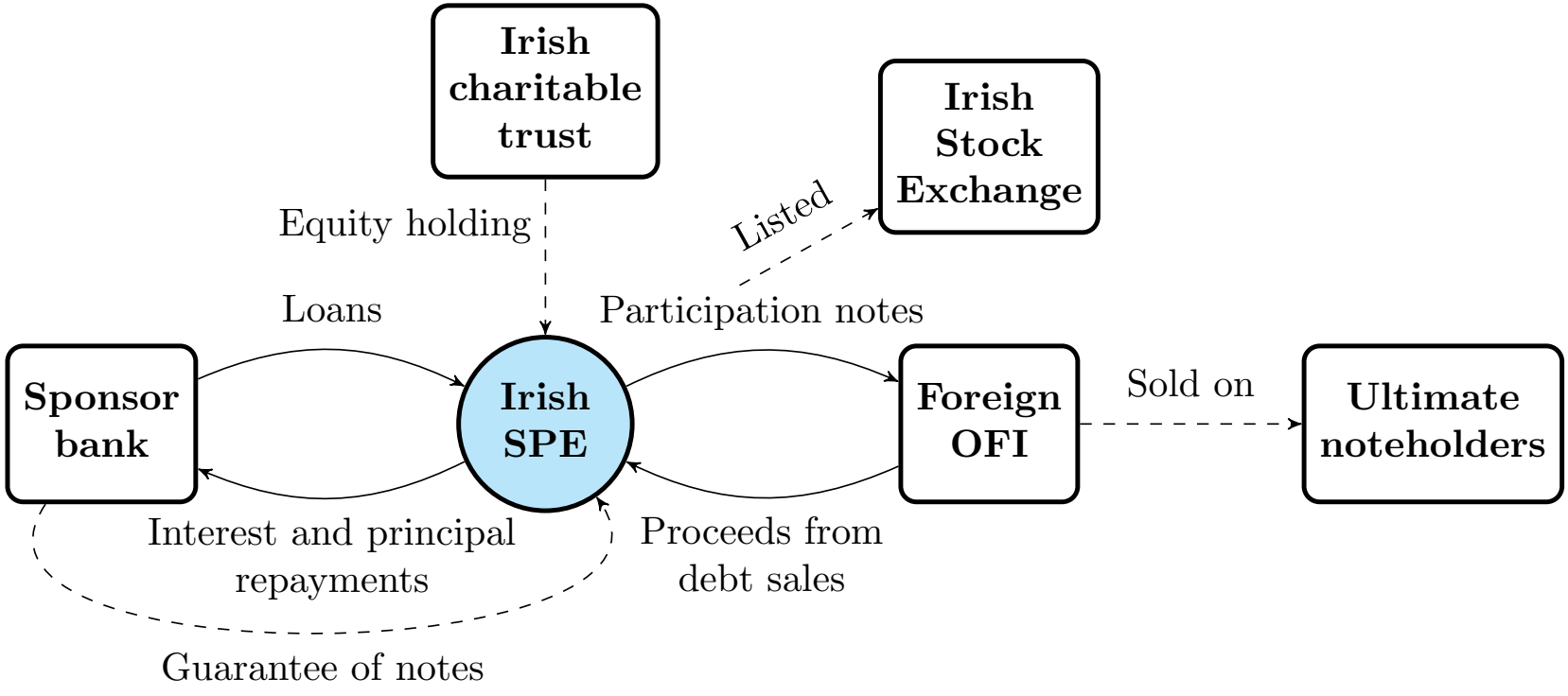

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- **Motivation**: Secure cheaper funding.

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- Cross-border bank-related debt flows (Lane, 2014):
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- Global spillovers $\rightarrow$ Regulatory environment $\rightarrow$ Cross-border bank flows (Houston et al, 2012; Cerutti et al, 2015; Buch et al, 2016).

Research goal and data

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- **Sample split analysis** → Sponsor banks from AE account for 85% of the sample observations → Analysis of full sample and this sub-sample.

Variables

Variable	Description	Source
DFB (Irish SPE)	Binary variable indicating 1 for debt funding issued through an Irish SPE, and 0 otherwise.	Central Bank of Ireland statistics.
DFR (Irish SPE)	Debt funding volume issued through an Irish SPE to total assets ratio.	Central Bank of Ireland statistics.
DFB (other)	Binary variable indicating 1 for senior and subordinated debt funding issuance other than through an Irish SPE, and 0 otherwise.	SNL Financial.
Size	Natural logarithm of total assets.	Bloomberg.
ROA	Return on assets ratio.	Bloomberg.
Tier 1 ratio	Regulatory Tier 1 capital to total assets ratio.	Bloomberg.
LLP/Loans ratio	Loan loss provisions to total loans ratio.	Bloomberg.
Funding constraint	Binary variable indicating 1 for sponsor banks with loan growth rates greater than the median level of all sponsor bank quarter observations and funding interest expenses greater than the median level of all sponsor bank quarter observations, and 0 otherwise.	Bloomberg.
Low Tier 1 ratio	Binary variable indicating 1 for sponsor banks with a Tier 1 ratio lower than the median level of all sponsor bank quarter observations, and 0 otherwise.	Bloomberg.
CFM	Overall index of capital flow controls (restrictions) including all asset categories.	Fernandez et al. (2015).
Tax	Country-level corporate income tax rate.	OECD and KPMG.
Macro-pru	Cumulative change in the aggregate sector-specific capital buffer instruments requiring banks to finance a larger fraction of these exposures with capital (including real estate credit, consumer credit and other sectors).	Cerrutti et al. (2015).
GDP growth	Growth rate of GDP per capita.	World Bank GFDD.
Population growth	Growth rate of population.	World Bank GFDD.

Bivariate Probit model

- Model international sponsor banks' binary debt issuance choice among two alternatives: debt and via Irish SPEs;
- Simultaneous estimation employing a 2-equation multivariate probit model:

$$DFB_{m,i,j,t} = I(DFB^{*}_{m,i,j,t} > 0), m = 1, 2$$

$$DFB^{*}_{m,i,j,t} = \beta' W_{m,i,j,(t-1)} + \gamma' Z_{m,j,(t-1)} + \sum_{t} \delta_t T_t + \epsilon_{i,j,t}$$

m represents the debt issuance choice among two alternatives. i, j, t denote sponsor bank, country and quarter, respectively. $W_{m,i,j,(t-1)}$ captures sponsor bank-specific characteristics, and $Z_{m,j,(t-1)}$ consists of country-level control variables.

Empirical results – full sample

	Dependent variable: *DFB (Irish SPE)*				
	Baseline (1)	*CFM* (2)	*Tax* (3)	*Macro-pru* (4)	*Herding* (5)
Size	0.457***	0.876***	0.568***	0.490***	0.398***
	(0.035)	(0.085)	(0.063)	(0.034)	(0.033)
ROA	0.192**	0.294*	0.251	0.275***	0.105*
	(0.060)	(0.138)	(0.131)	(0.058)	(0.053)
Tier 1 ratio	0.007	0.041	0.022		0.021
	(0.016)	(0.031)	(0.029)		(0.016)
LLP/Loans ratio	0.137***	0.144*	0.185**	0.195***	0.132***
	(0.024)	(0.070)	(0.069)	(0.028)	(0.024)
GDP growth	0.051	-0.570**	0.022	0.148	0.054
	(0.110)	(0.200)	(0.179)	(0.104)	(0.111)
Population growth	-0.072	0.020	-0.030	0.020	-0.033
	(0.120)	(0.186)	(0.161)	(0.136)	(0.127)
Funding constraint		-0.917***	-0.311		
		(0.230)	(0.597)		
CFM		2.761***			
		(0.775)			
Funding constraint × *CFM*		5.855***			
		(1.300)			
Tax			-0.002		
			(0.011)		
Funding constraint × *Tax*			0.012		
			(0.018)		
Low Tier 1 ratio				0.209	
				(0.109)	
Macro-pru				0.152*	
				(0.073)	
Low Tier 1 ratio × *Macro-pru*				-0.060	
				(0.125)	
Country DFB (Irish SPE)					0.227***
					(0.026)
# Observations	1,882	871	871	1,969	1,882
Time fixed effects	YES	YES	YES	YES	YES
Robust clustered std. errors	YES	YES	YES	YES	YES
Pseudo R^2	0.614	0.840	0.836	0.587	0.624

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- Sponsor banks more likely to issue debt through an Irish SPE:

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	(0.024)	(0.070)	(0.069)	(0.028)	(0.024)
GDP growth	0.051	-0.570**	0.022	0.148	0.054
	(0.110)	(0.200)	(0.179)	(0.104)	(0.111)
Population growth	-0.072	0.020	-0.030	0.020	-0.033
	(0.120)	(0.186)	(0.161)	(0.136)	(0.127)
Funding constraint		-0.917***	-0.311		
		(0.230)	(0.597)		
CFM		2.761***			
		(0.775)			
Funding constraint × *CFM*		5.855***			
		(1.300)			
Tax			-0.002		
			(0.011)		
Funding constraint × *Tax*			0.012		
			(0.018)		
Low Tier 1 ratio				0.209	
				(0.109)	
Macro-pru				0.152*	
				(0.073)	
Low Tier 1 ratio × *Macro-pru*				-0.060	
				(0.125)	
Country DFB (Irish SPE)					0.227***
					(0.026)
# Observations	1,882	871	871	1,969	1,882
Time fixed effects	YES	YES	YES	YES	YES
Robust clustered std. errors	YES	YES	YES	YES	YES
Pseudo R^2	0.614	0.840	0.836	0.587	0.624

Standard errors in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

- Sponsor banks more likely to issue debt through an Irish SPE:
  - ↑ bank size
  - ↑ loan loss provisions ratio
  - ↑ profitability (FS only)
  - ↑ tier 1 (AE only)

Empirical results – full sample

	Dependent variable: *DFB (Irish SPE)*				
	Baseline (1)	*CFM* (2)	*Tax* (3)	*Macro-pru* (4)	*Herding* (5)
Size	0.457***	0.876***	0.568***	0.490***	0.398***
	(0.035)	(0.085)	(0.063)	(0.034)	(0.033)
ROA	0.192**	0.294*	0.251	0.275***	0.105*
	(0.060)	(0.138)	(0.131)	(0.058)	(0.053)
Tier 1 ratio	0.007	0.041	0.022		0.021
	(0.016)	(0.031)	(0.029)		(0.016)
LLP/Loans ratio	0.137***	0.144*	0.185**	0.195***	0.132***
	(0.024)	(0.070)	(0.069)	(0.028)	(0.024)
GDP growth	0.051	-0.570**	0.022	0.148	0.054
	(0.110)	(0.200)	(0.179)	(0.104)	(0.111)
Population growth	-0.072	0.020	-0.030	0.020	-0.033
	(0.120)	(0.186)	(0.161)	(0.136)	(0.127)
Funding constraint		-0.917***	-0.311		
		(0.230)	(0.597)		
CFM		2.761***			
		(0.775)			
Funding constraint × *CFM*		5.855***			
		(1.300)			
Tax			-0.002		
			(0.011)		
Funding constraint × *Tax*			0.012		
			(0.018)		
Low Tier 1 ratio				0.209	
				(0.109)	
Macro-pru				0.152*	
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Low Tier 1 ratio × *Macro-pru*				-0.060	
				(0.125)	
Country DFB (Irish SPE)					0.227***
					(0.026)
# Observations	1,882	871	871	1,969	1,882
Time fixed effects	YES	YES	YES	YES	YES
Robust clustered std. errors	YES	YES	YES	YES	YES
Pseudo R^2	0.614	0.840	0.836	0.587	0.624

Standard errors in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

- Sponsor banks more likely to issue debt through an Irish SPE:
  - ↑ bank size
  - ↑ loan loss provisions ratio
  - ↑ profitability (FS only)
  - ↑ tier 1 (AE only)
- Country-level:

Empirical results – full sample

	Dependent variable: *DFB (Irish SPE)*				
	Baseline (1)	*CFM* (2)	*Tax* (3)	*Macro-pru* (4)	*Herding* (5)
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Tier 1 ratio	0.007	0.041	0.022		0.021
	(0.016)	(0.031)	(0.029)		(0.016)
LLP/Loans ratio	0.137***	0.144*	0.185**	0.195***	0.132***
	(0.024)	(0.070)	(0.069)	(0.028)	(0.024)
GDP growth	0.051	-0.570**	0.022	0.148	0.054
	(0.110)	(0.200)	(0.179)	(0.104)	(0.111)
Population growth	-0.072	0.020	-0.030	0.020	-0.033
	(0.120)	(0.186)	(0.161)	(0.136)	(0.127)
Funding constraint		-0.917***	-0.311		
		(0.230)	(0.597)		
CFM		2.761***			
		(0.775)			
Funding constraint × *CFM*		5.855***			
		(1.300)			
Tax			-0.002		
			(0.011)		
Funding constraint × *Tax*			0.012		
			(0.018)		
Low Tier 1 ratio				0.209	
				(0.109)	
Macro-pru				0.152*	
				(0.073)	
Low Tier 1 ratio × *Macro-pru*				-0.060	
				(0.125)	
Country DFB (Irish SPE)					0.227***
					(0.026)
# Observations	1,882	871	871	1,969	1,882
Time fixed effects	YES	YES	YES	YES	YES
Robust clustered std. errors	YES	YES	YES	YES	YES
Pseudo R^2	0.614	0.840	0.836	0.587	0.624

Standard errors in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

- Sponsor banks more likely to issue debt through an Irish SPE:
  - ↑ bank size
  - ↑ loan loss provisions ratio
  - ↑ profitability (FS only)
  - ↑ tier 1 (AE only)
- Country-level:
  - ↑ CFM (particularly for funding constrained banks)
  - ↑ Macro-pru
  - ↑ Herding
  - ↑ Tax (only AE funding constrained banks)

Tobit model

- Model sponsor banks' debt issuance volumes;
- Tobit regression analysis for our dependent variable left-censored at zero :

$$DFR_{i,j,t} = \begin{cases} DFR^*_{i,j,t} & \text{if } DFR^*_{i,j,t} > 0 \\ 0 & \text{if } DFR^*_{i,j,t} \leq 0 \end{cases}$$

$$DFR^*_{i,j,t} = \beta' W_{i,j,(t-1)} + \gamma' Z_{j,(t-1)} + \sum_t \delta_t T_t + \epsilon_{i,j,t}$$

i, j and t denote the sponsor bank, country and quarter, respectively. The dependent variable $DFR_{i,j,t}$ is the ratio of total volume of debt issued to total assets, for sponsor bank i in country j in quarter t. $DFR^*_{i,j,t}$ is the latent variable in our Tobit regressions.

Empirical results – full sample

	Dependent variable: *DFR (Irish SPE)*				
	Baseline	*CFM*	*Tax*	*Macro-pru*	*Herding*
	(1)	(2)	(3)	(4)	(5)
Size	0.237***	0.094***	0.067***	0.191***	0.193**
	(0.071)	(0.016)	(0.012)	(0.027)	(0.062)
ROA	0.219**	0.098**	0.108**	0.224***	0.160*
	(0.078)	(0.034)	(0.036)	(0.063)	(0.066)
Tier 1 ratio	0.005	0.005	-0.008		0.016
	(0.017)	(0.005)	(0.007)		(0.019)
LLP/Loans ratio	0.130*	0.035*	0.051**	0.124***	0.125*
	(0.063)	(0.014)	(0.017)	(0.025)	(0.063)
GDP growth	0.002	-0.076	0.018	0.134*	0.005
	(0.091)	(0.048)	(0.039)	(0.066)	(0.089)
Population growth	-0.147	-0.002	-0.022	-0.003	-0.116
	(0.106)	(0.035)	(0.033)	(0.067)	(0.103)
Funding constraint		-0.260**	0.047		
		(0.086)	(0.148)		
CFM		0.149			
		(0.159)			
Funding constraint × *CFM*		1.608***			
		(0.457)			
Tax			-0.005		
			(0.003)		
Funding constraint × *Tax*			-0.002		
			(0.004)		
Low Tier 1 ratio				0.170**	
				(0.061)	
Macro-pru				-0.015	
				(0.045)	
Low Tier 1 ratio × *Macro-pru*				-0.039	
				(0.099)	
Country DFB (Irish SPE)					0.123***
					(0.035)
# Observations	1,882	871	871	1,969	1,882
Time fixed effects	YES	YES	YES	YES	YES
Robust std. errors	YES	YES	YES	YES	YES
Pseudo R^2	0.492	0.888	0.869	0.555	0.503

Standard errors in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Empirical results – full sample

	Dependent variable: *DFR (Irish SPE)*				
	Baseline (1)	*CFM* (2)	*Tax* (3)	*Macro-pru* (4)	*Herding* (5)
Size	0.237***	0.094***	0.067***	0.191***	0.193**
	(0.071)	(0.016)	(0.012)	(0.027)	(0.062)
ROA	0.219**	0.098**	0.108**	0.224***	0.160*
	(0.078)	(0.034)	(0.036)	(0.063)	(0.066)
Tier 1 ratio	0.005	0.005	-0.008		0.016
	(0.017)	(0.005)	(0.007)		(0.019)
LLP/Loans ratio	0.130*	0.035*	0.051**	0.124***	0.125*
	(0.063)	(0.014)	(0.017)	(0.025)	(0.063)
GDP growth	0.002	-0.076	0.018	0.134*	0.005
	(0.091)	(0.048)	(0.039)	(0.066)	(0.089)
Population growth	-0.147	-0.002	-0.022	-0.003	-0.116
	(0.106)	(0.035)	(0.033)	(0.067)	(0.103)
Funding constraint		-0.260**	0.047		
		(0.086)	(0.148)		
CFM		0.149			
		(0.159)			
Funding constraint × *CFM*		1.608***			
		(0.457)			
Tax			-0.005		
			(0.003)		
Funding constraint × *Tax*			-0.002		
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Low Tier 1 ratio				0.170**	
				(0.061)	
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				(0.045)	
Low Tier 1 ratio × *Macro-pru*				-0.039	
				(0.099)	
Country DFB (Irish SPE)					0.123***
					(0.035)
# Observations	1,882	871	871	1,969	1,882
Time fixed effects	YES	YES	YES	YES	YES
Robust std. errors	YES	YES	YES	YES	YES
Pseudo R^2	0.492	0.888	0.869	0.555	0.503

Standard errors in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

- Debt issuance volumes by sponsor banks through Irish SPEs increase with:

Empirical results – full sample

	Dependent variable: *DFR (Irish SPE)*				
	Baseline (1)	*CFM* (2)	*Tax* (3)	*Macro-pru* (4)	*Herding* (5)
Size	0.237***	0.094***	0.067***	0.191***	0.193**
	(0.071)	(0.016)	(0.012)	(0.027)	(0.062)
ROA	0.219**	0.098**	0.108**	0.224***	0.160*
	(0.078)	(0.034)	(0.036)	(0.063)	(0.066)
Tier 1 ratio	0.005	0.005	-0.008		0.016
	(0.017)	(0.005)	(0.007)		(0.019)
LLP/Loans ratio	0.130*	0.035*	0.051**	0.124***	0.125*
	(0.063)	(0.014)	(0.017)	(0.025)	(0.063)
GDP growth	0.002	-0.076	0.018	0.134*	0.005
	(0.091)	(0.048)	(0.039)	(0.066)	(0.089)
Population growth	-0.147	-0.002	-0.022	-0.003	-0.116
	(0.106)	(0.035)	(0.033)	(0.067)	(0.103)
Funding constraint		-0.260**	0.047		
		(0.086)	(0.148)		
CFM		0.149			
		(0.159)			
Funding constraint × *CFM*		1.608***			
		(0.457)			
Tax			-0.005		
			(0.003)		
Funding constraint × *Tax*			-0.002		
			(0.004)		
Low Tier 1 ratio				0.170**	
				(0.061)	
Macro-pru				-0.015	
				(0.045)	
Low Tier 1 ratio × *Macro-pru*				-0.039	
				(0.099)	
Country DFB (Irish SPE)					0.123***
					(0.035)
# Observations	1,882	871	871	1,969	1,882
Time fixed effects	YES	YES	YES	YES	YES
Robust std. errors	YES	YES	YES	YES	YES
Pseudo R^2	0.492	0.888	0.869	0.555	0.503

Standard errors in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

- Debt issuance volumes by sponsor banks through Irish SPEs increase with:
  - ↑ bank size
  - ↑ loan loss provisions ratio
  - low Tier 1 ratio
  - ↑ profitability (FS only)

Empirical results – full sample

	Dependent variable: *DFR (Irish SPE)*				
	Baseline (1)	*CFM* (2)	*Tax* (3)	*Macro-pru* (4)	*Herding* (5)
Size	0.237***	0.094***	0.067***	0.191***	0.193**
	(0.071)	(0.016)	(0.012)	(0.027)	(0.062)
ROA	0.219**	0.098**	0.108**	0.224***	0.160*
	(0.078)	(0.034)	(0.036)	(0.063)	(0.066)
Tier 1 ratio	0.005	0.005	-0.008		0.016
	(0.017)	(0.005)	(0.007)		(0.019)
LLP/Loans ratio	0.130*	0.035*	0.051**	0.124***	0.125*
	(0.063)	(0.014)	(0.017)	(0.025)	(0.063)
GDP growth	0.002	-0.076	0.018	0.134*	0.005
	(0.091)	(0.048)	(0.039)	(0.066)	(0.089)
Population growth	-0.147	-0.002	-0.022	-0.003	-0.116
	(0.106)	(0.035)	(0.033)	(0.067)	(0.103)
Funding constraint		-0.260**	0.047		
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CFM		0.149			
		(0.159)			
Funding constraint × *CFM*		1.608***			
		(0.457)			
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Country DFB (Irish SPE)					0.123***
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# Observations	1,882	871	871	1,969	1,882
Time fixed effects	YES	YES	YES	YES	YES
Robust std. errors	YES	YES	YES	YES	YES
Pseudo R^2	0.492	0.888	0.869	0.555	0.503

Standard errors in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

- Debt issuance volumes by sponsor banks through Irish SPEs increase with:
  - ↑ bank size
  - ↑ loan loss provisions ratio
  - low Tier 1 ratio
  - ↑ profitability (FS only)
- Less crucial role of regulatory capital;

Empirical results – full sample

	Dependent variable: *DFR (Irish SPE)*				
	Baseline (1)	*CFM* (2)	*Tax* (3)	*Macro-pru* (4)	*Herding* (5)
Size	0.237***	0.094***	0.067***	0.191***	0.193**
	(0.071)	(0.016)	(0.012)	(0.027)	(0.062)
ROA	0.219**	0.098**	0.108**	0.224***	0.160*
	(0.078)	(0.034)	(0.036)	(0.063)	(0.066)
Tier 1 ratio	0.005	0.005	-0.008		0.016
	(0.017)	(0.005)	(0.007)		(0.019)
LLP/Loans ratio	0.130*	0.035*	0.051**	0.124***	0.125*
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	(0.091)	(0.048)	(0.039)	(0.066)	(0.089)
Population growth	-0.147	-0.002	-0.022	-0.003	-0.116
	(0.106)	(0.035)	(0.033)	(0.067)	(0.103)
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Country DFB (Irish SPE)					0.123***
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# Observations	1,882	871	871	1,969	1,882
Time fixed effects	YES	YES	YES	YES	YES
Robust std. errors	YES	YES	YES	YES	YES
Pseudo R^2	0.492	0.888	0.869	0.555	0.503

Standard errors in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

- Debt issuance volumes by sponsor banks through Irish SPEs increase with:
  - ↑ bank size
  - ↑ loan loss provisions ratio
  - low Tier 1 ratio
  - ↑ profitability (FS only)
- Less crucial role of regulatory capital;
- Country-level:

Empirical results – full sample

	Dependent variable: *DFR (Irish SPE)*				
	Baseline (1)	*CFM* (2)	*Tax* (3)	*Macro-pru* (4)	*Herding* (5)
Size	0.237***	0.094***	0.067***	0.191***	0.193**
	(0.071)	(0.016)	(0.012)	(0.027)	(0.062)
ROA	0.219**	0.098**	0.108**	0.224***	0.160*
	(0.078)	(0.034)	(0.036)	(0.063)	(0.066)
Tier 1 ratio	0.005	0.005	-0.008		0.016
	(0.017)	(0.005)	(0.007)		(0.019)
LLP/Loans ratio	0.130*	0.035*	0.051**	0.124***	0.125*
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GDP growth	0.002	-0.076	0.018	0.134*	0.005
	(0.091)	(0.048)	(0.039)	(0.066)	(0.089)
Population growth	-0.147	-0.002	-0.022	-0.003	-0.116
	(0.106)	(0.035)	(0.033)	(0.067)	(0.103)
Funding constraint		-0.260**	0.047		
		(0.086)	(0.148)		
CFM		0.149			
		(0.159)			
Funding constraint × CFM		1.608***			
		(0.457)			
Tax			-0.005		
			(0.003)		
Funding constraint × Tax			-0.002		
			(0.004)		
Low Tier 1 ratio				0.170**	
				(0.061)	
Macro-pru				-0.015	
				(0.045)	
Low Tier 1 ratio × Macro-pru				-0.039	
				(0.099)	
Country DFB (Irish SPE)					0.123***
					(0.035)
# Observations	1,882	871	871	1,969	1,882
Time fixed effects	YES	YES	YES	YES	YES
Robust std. errors	YES	YES	YES	YES	YES
Pseudo R^2	0.492	0.888	0.869	0.555	0.503

Standard errors in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

- Debt issuance volumes by sponsor banks through Irish SPEs increase with:
  - ↑ bank size
  - ↑ loan loss provisions ratio
  - low Tier 1 ratio
  - ↑ profitability (FS only)
- Less crucial role of regulatory capital;
- Country-level:
  - ↑ CFM (only FS funding constrained banks)
  - ↑ Herding
  - Tax insignificant

OLS model

- Model the impact of debt funding through Irish SPEs on sponsor bank characteristics:

$$\begin{aligned} W_{i,j,t} = {} & \lambda \textit{Sponsor bank DFB (Irish SPE) past year}_{i,t-(1,\ldots,4)} \\ & + \omega \textit{Sponsor bank DFB (other) past year}_{i,t-(1,\ldots,4)} \\ & + \beta' W_{i,j,(t-2)} + \gamma' Z_{j,(t-1)} + \sum_t \delta_t T_t + \epsilon_{i,j,t} \end{aligned}$$

i, j and t denote the sponsor bank, country and quarter, respectively. The dependent variable $W_{i,j,t}$ represents sponsor bank-specific characteristics, *Sponsor bank DFB (Irish SPE) past year*$_{i,t-(1,\ldots,4)}$ is a binary variable capturing debt issuance through an Irish SPE in the past four quarters and *Sponsor bank DFB (other) past year*$_{i,t-(1,\ldots,4)}$ is a binary variable capturing debt issuance other than through an Irish SPE in the past four quarters. $W_{i,j,(t-2)}$ is a vector sponsor bank-specific regressors, lagged by two periods. $Z_{j,(t-1)}$ consists of country-level control variables. $\epsilon_{i,j,t}$ is an i.i.d. error term which follows a normal distribution.

Empirical results – full sample

	Dependent variable:			
	Size	*ROA*	*LLP/Loans ratio*	*Tier 1 ratio*
	(1)	(2)	(3)	(4)
Sponsor bank DFB (Irish SPE) past year	1.245***	0.173	0.600*	-0.038
	(0.271)	(0.125)	(0.242)	(0.407)
Sponsor bank DFB (other) past year	0.900	0.182	-0.530	-0.886
	(0.472)	(0.165)	(0.364)	(0.645)
# Observations	1,866	1,866	1,869	1,885
Controls	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES
Robust clustered std. errors	YES	YES	YES	YES
Adjusted R^2	0.379	0.224	0.284	0.363

Standard errors in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Empirical results – full sample

	Dependent variable:			
	Size	*ROA*	*LLP/Loans ratio*	*Tier 1 ratio*
	(1)	(2)	(3)	(4)
Sponsor bank DFB (Irish SPE) past year	1.245***	0.173	0.600*	-0.038
	(0.271)	(0.125)	(0.242)	(0.407)
Sponsor bank DFB (other) past year	0.900	0.182	-0.530	-0.886
	(0.472)	(0.165)	(0.364)	(0.645)
# Observations	1,866	1,866	1,869	1,885
Controls	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES
Robust clustered std. errors	YES	YES	YES	YES
Adjusted R^2	0.379	0.224	0.284	0.363

Standard errors in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

- Debt issuance through Irish SPEs has a particular impact on:

Empirical results – full sample

	Dependent variable:			
	Size	*ROA*	*LLP/Loans ratio*	*Tier 1 ratio*
	(1)	(2)	(3)	(4)
Sponsor bank DFB (Irish SPE) past year	1.245***	0.173	0.600*	-0.038
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- Debt issuance through Irish SPEs has a particular impact on:
  - ↑ bank size
  - ↑ loan loss provisions ratio
- No evidence of other debt issuance impacting sponsor bank characteristics.

Next steps

- **"Top down"** → Drill down further into why sponsor banks employ Irish SPEs for debt funding:

Next steps

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  - "Top-down" analysis helps to guide the focus;
  - Co-operation across borders and data sharing capabilities.
- Develop a comprehensive register of SPE activity types.

Thank you!

Outline

Context

Mapping

- The whole SPE reporting population
- Specific sponsor bank-linked SPEs
- Typical business models employed by sponsor banks

Initial research

- Motivation
- Research goal and data
- Empirical strategy I: Bivariate Probit model
- Empirical strategy II: Tobit model
- Empirical strategy III: OLS model

Conclusions