The Effect of Monetary Policy on Systemic Bank Funding Stability

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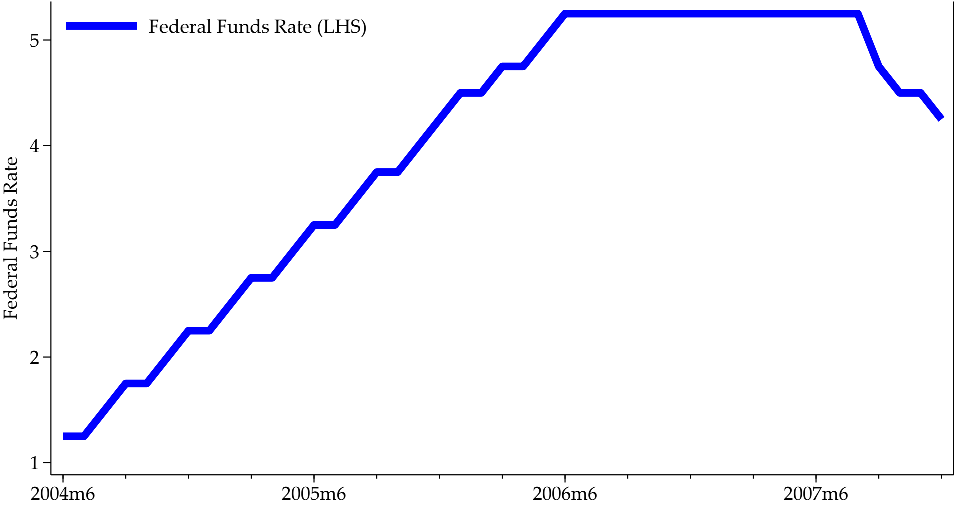
Federal Reserve Board

4th CEMLA/Dallas Fed Financial Stability Workshop

November 24

Motivation: The U.S. Financial Crisis



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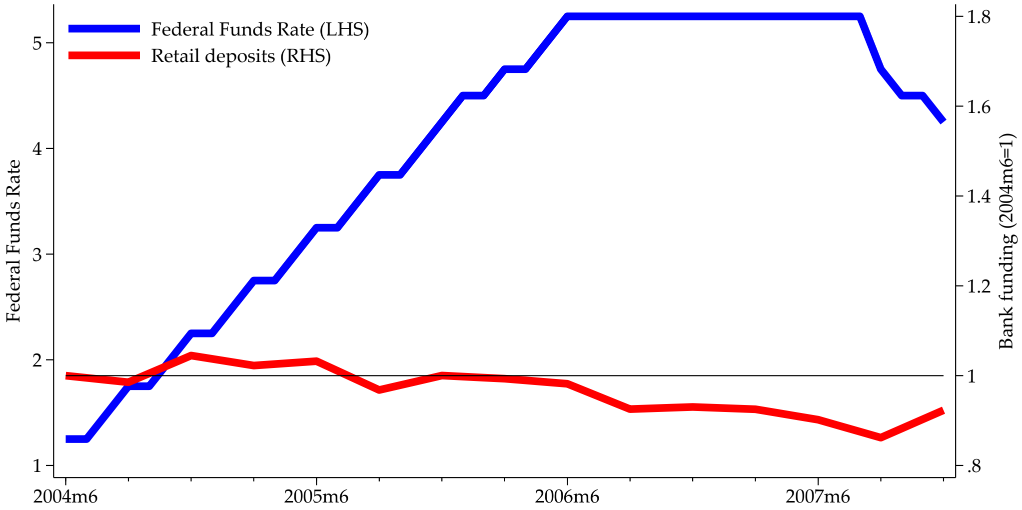

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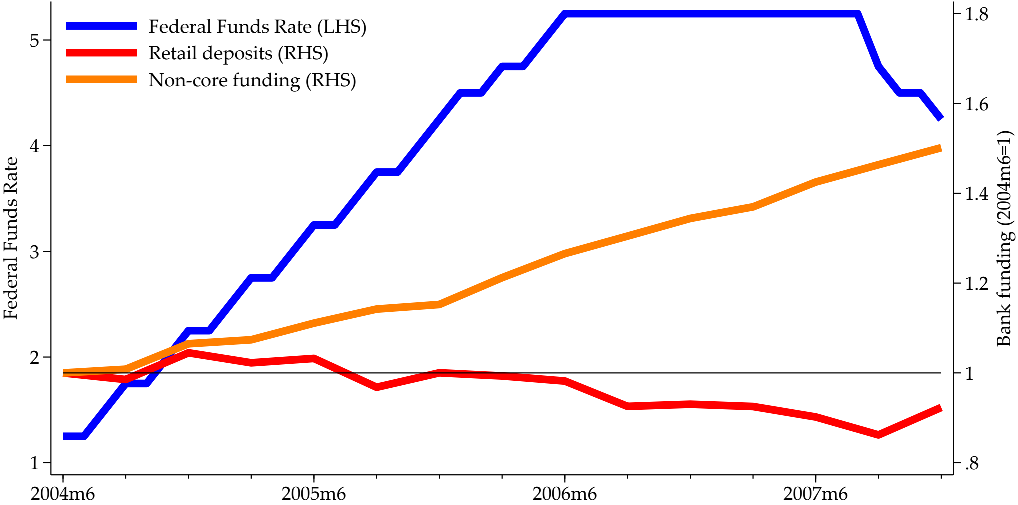

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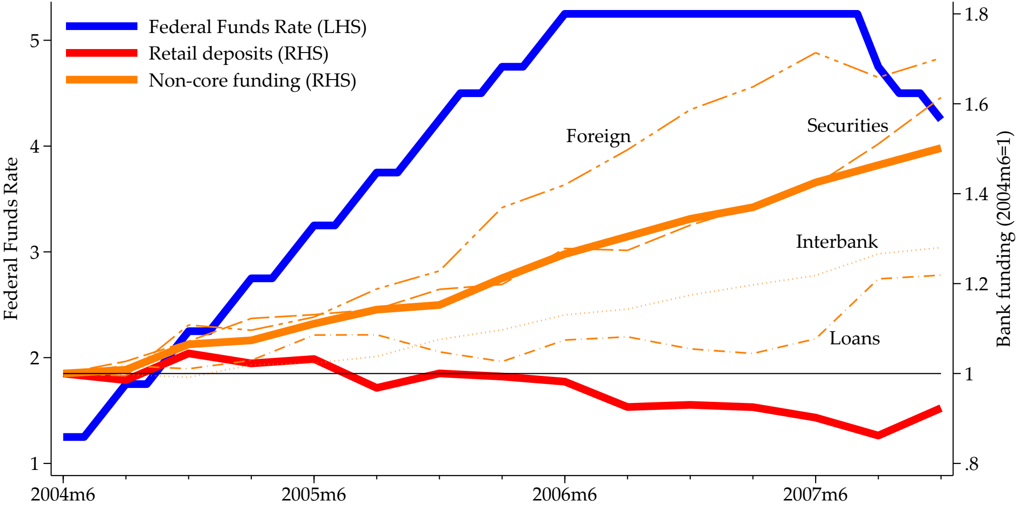

Research Questions

I. What is the effect of **monetary policy** on banking systems' **non-core funding shares**?

Non-core funding: *all funding sources other than equity, traditional customer deposits, and those provided by the government and central bank*

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Non-core funding: *all funding sources other than equity, traditional customer deposits, and those provided by the government and central bank*

II. Do increasing non-core shares, induced by monetary tightening, create **systemic risk**?

Systemic risk: *systemic banking panics, financial crises*

Baron et al. (2021) Laeven and Valencia (2020)

This paper

- Constructs a novel macro-financial dataset at monthly frequency covering
  - the liability structure of banking systems and policy rates
  - developed and developing economies
  - the post-1950s

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  - the liability structure of banking systems and policy rates
  - developed and developing economies
  - the post-1950s
- Explores, within an IV setting, the relationship

$$\begin{tikzcd} \text{Contractionary MP} \arrow[r, "\mathcal{A}"'] \arrow[rr, bend right, "\mathcal{C}"'] & \text{Increasing reliance on non-core funding} \arrow[r, "\mathcal{B}"'] & \text{Systemic financial instability} \end{tikzcd}$$

Mechanism: Implications of monetary tightening

- Preference for liquidity allows banks to raise deposit rates less than policy rates
  Drechsler et al. (2017)

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  II. bank fundamentals have deteriorated

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- Non-core run *does* cause bank insolvency when
  - I. the share of non-core funding is sufficiently high
  - II. bank fundamentals have deteriorated
- This is precisely what happens after monetary tightening

Model

Three main empirical findings

I. Effects of contractionary MP shocks:
   - Withdrawals of retail deposits
   - Inflow of non-core funding
   - → Rising non-core funding shares

$$\begin{tikzcd}
\text{MP} \arrow[r, "\mathcal{A}"'] \arrow[rr, bend right, "\mathcal{C}"'] & \text{Bank funding} \arrow[r, "\mathcal{B}"'] & \text{Instability}
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II. Dynamics before systemic instability:

- Withdrawals of retail deposits
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III. *Direct* link between monetary policy, bank funding, and stability risk

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  - I show that banking systems' non-core reliance predicts financial instability
- Evidence on the role of MP in this relationship is lacking
  - I find evidence for a direct chain linking MP, bank funding, and instability
  - I provide an explanation for the 'reduced-form effect' of MP on instability
    Schularick et al. (2021); Jiménez et al. (2025)

Creating a new macro-financial dataset

- Basis: IMF's **International Financial Statistics (IFS)**
  - Published monthly since January 1948 covering 'the world'
  - Only small portion included in the IMF online database
  - Credit and deposit data for some countries is already digitized
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- **This dataset:**
  - Aggregate bank balance sheet positions & basic macro variables
  - Developed and developing economies, monthly frequency
  - 1950s–today, unbalanced panel
  - Complemented with novel data on policy rates

Availability of bank balance sheet positions

Asset	Countries	Obs.	Liability	Countries	Obs.
Private Credit	189	104,587	Demand Deposits	188	104,854
Public Corporations	177	72,137	Time Deposits	184	102,309
Foreign	188	103,894	Foreign	188	103,078
CB (Reserves)	188	105,280	CB	182	97,776
CB (Other)	173	47,553			
Government	189	104,031	Government	183	97,421
Other Fin. Institutions	174	64,038	Other Fin. Institutions	174	52,277
			Securities	177	69,117
			— Short-term	173	60,517
			— Long-term	174	41,946
			Loans	171	38,003
			Derivatives	171	37,740
			ITRs	171	37,707
			Capital	186	97,618

Illustration of data coverage Comparison with other datasets Time series

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Illustration of data coverage | Comparison with other datasets | Time series

Non-core funding

Identifying monetary policy shocks: Trilemma IV

- Building on the **trilemma of international finance**
  Obstfeld and Taylor (2004); di Giovanni et al. (2009); Jordà et al. (2020)
- Absence of international arbitrage $\Rightarrow$ pegging country has to adjust its policy rates in tandem with the base country
- Identification assumption: base country's interest rate decisions do not take economic conditions of the pegging country into account

Exploit 3 features of the new dataset to refine the instrument

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   - EMEs often peg their currency to that of an AE

III. **Policy rates** serve as a better proxy for MP than short-term market rates
   - Short-term market rates in EMEs are influenced by time-varying risk premia De Leo et al. (2022)

Does monetary tightening cause rising non-core shares?

Local projection:
Jordà (2005)

$$\Delta_h y_{i,t+h} = \alpha_i^h + \beta^h \Delta R_{i,t}^{policy} + \sum_{k=1}^{12} \gamma_k^h \Delta R_{i,t-k}^{policy} + \sum_{k=0}^{12} \delta_k^h \Delta y_{i,t-k} + \mathbf{\Gamma}^h \boldsymbol{X}_{i,t} + e_{i,t+h}$$

- α: country fixed effects
- $\boldsymbol{X}$: lags 0 to 12 of monthly changes in
  - log exchange rate vis-à-vis USD
  - log CPI
  - log real private credit
- R^{policy}: monetary policy rate, instrumented with z

Formal construction of the instrument

First stage

Dep. var.: $\Delta R^{policy}_{i,t}$	(1)
$z_{i,t}$	0.268***
	(0.058)
Controls	✗
Country FEs	✓
Time FEs	✗
KP weak IV	21.50
Countries	157
Observations	46065

Notes: OLS estimates of γ with country-based cluster-robust SEs of $\Delta R^{policy}_{i,t} = \alpha_i + \gamma z_{i,t} + \sum_{k=1}^{12} \delta^k \Delta R^{policy}_{i,t-k} + \mathbf{\Gamma X}_{i,t} + e_{i,t}$. *KP weak IV* refers to the Kleibergen-Paap (2006) Wald rk F-statistic.

AEs and non-AEs Floaters maintain independence

First stage

Dep. var.: $\Delta R^{policy}_{i,t}$	(1)	(2)	(3)	(4)
$z_{i,t}$	0.268***	0.397***	0.360***	0.318***
	(0.058)	(0.065)	(0.062)	(0.075)
Controls	✗	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	Year	Year $\times$ Month
KP weak IV	21.50	36.77	33.14	18.23
Countries	157	154	154	154
Observations	46065	36762	36762	36762

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Monetary policy shifts bank funding: 12-month horizon

	Non-core Demand Dep.
$\Delta R^{policy}_{i,t}$	15.338***
	(4.267)
Controls	✓
Country FEs	✓
Time FEs	✗
KP weak IV	46.38
Countries	151
Observations	31618

Notes: LP-IV estimates of β^{12} with country-based cluster-robust SEs. ΔR^{policy}_t is instrumented with z_t. The response variables are log-transformed. *KP weak IV* refers to the Kleibergen-Paap (2006) Wald rk F-statistic.

No controls | W/ GDP | W/ VIX | W/ Time FEs | W/ U.S. shocks | Subset of peggers | Subset of AEs | W/o EA countries
$\Delta_{12} R^{policy}$ | Symmetry | NIMs | Spreads | Other ratios | Indiv. non-core positions | Other positions

Monetary policy shifts bank funding: 12-month horizon

		Real Quantities	
	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Demand Dep.	Non-core
$\Delta R_{i,t}^{policy}$	15.338***	-8.585***	7.973**
	(4.267)	(2.608)	(3.912)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	46.38	51.58	45.32
Countries	151	152	152
Observations	31618	33307	31892

Notes: LP-IV estimates of β^{12} with country-based cluster-robust SEs. ΔR_t^{policy} is instrumented with z_t. The response variables are log-transformed. *KP weak IV* refers to the Kleibergen-Paap (2006) Wald rk F-statistic.

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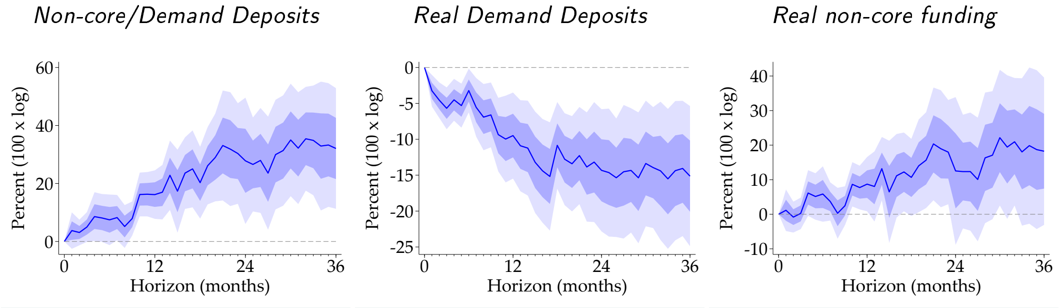
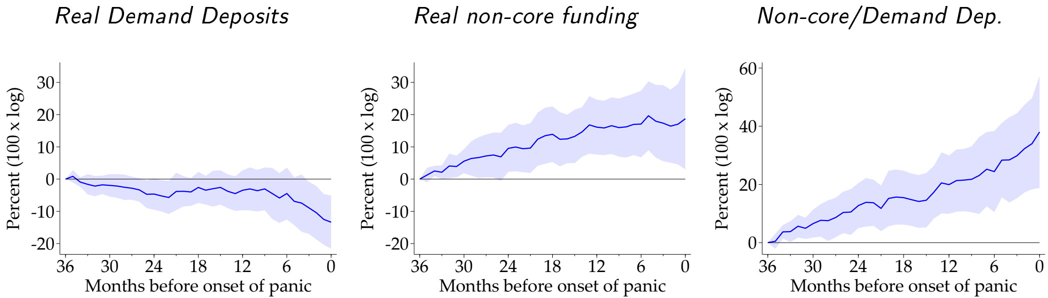
Monetary policy shifts bank funding: IRFs



Notes: LP-IV estimates of $\{\beta^h\}_{h=1}^{36}$. Shaded areas indicate 95% (light) and 68% (dark) confidence intervals based on country-based cluster-robust SEs.

Bank funding shifts before panics: event studies



Notes: Estimates of $\{\beta^h\}_{h=0}^{36}$ with 95% CIs of $y_{i,t-36+h} - y_{i,t-36} = \alpha_i^h + \beta^h \mathbb{1}\{\text{panic}_{i,t} = 1\} + e_{i,t-36+h}$. y is log-transformed for all variables.

Pre-crisis paths of bank funding | Other balance sheet ratios | Individual non-core positions

Other balance sheet positions | Time FEs | Post-panic paths | Without GFC | Timing comparison

Extensions

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- Paper and Appendix go beyond narratively identified panics and crises
  - Rising non-core ratios predict non-core runs, credit busts, and real disasters...
  - ...but not subsequent variations in retail deposits

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- Paper and Appendix go beyond narratively identified panics and crises
  - Rising non-core ratios predict non-core runs, credit busts, and real disasters. . .
  - . . . but not subsequent variations in retail deposits
- Shifts toward non-core funding are associated with weakening bank fundamentals
- Confirmation at the bank level

Taking stock

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II. Shifts toward non-core funding precede systemic financial instability

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III. Before panics and crises, monetary policy tightens
Schularick et al. (2021); Grimm et al. (2023); Jiménez et al. (2025)

Taking stock

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⇒ **Remaining question:**

Does MP directly affect financial stability through its effect on non-core funding?

Relative frequency tables

Tightening-induced rising non-core shares cause stability risk

	Banking panics
	(1)
$\Delta_{12}\left(\log \frac{\textit{Non-core}}{\textit{Demand}}\right)_{i,t}$	2.341***
	(0.856)
Instrument	$z_{i,t-12}$
Controls	✓
Country FEs	✓
Time FEs	✗
KP weak IV	14.46
Countries	41
Observations	12771

Notes: 2SLS estimates of 100β with country-based cluster-robust SEs of $y_{i,t+1,t+12} = \alpha_i + \beta\,\Delta_{12}\left(\log \frac{\textit{Non-core}}{\textit{Demand}}\right)_{i,t} + \mathbf{\Gamma}\boldsymbol{X}_{i,t} + u_{i,t+1}$. y refers to the onset of crises or panics.

Tightening-induced rising non-core shares cause stability risk

	Banking panics	
	(1)	(2)
$\Delta_{12}\left(\log \frac{\textit{Non-core}}{\textit{Demand}}\right)_{i,t}$	2.341***	2.238**
	(0.856)	(0.947)
Instrument	$z_{i,t-12}$	$\sum_{k=0}^{12} z_{i,t-12-k}$
Controls	✓	✓
Country FEs	✓	✓
Time FEs	✗	✗
KP weak IV	14.46	22.09
Countries	41	41
Observations	12771	12771

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Tightening-induced rising non-core shares cause stability risk

	Banking panics		Financial crises	
	(1)	(2)	(3)	(4)
$\Delta_{12}\left(\log \frac{\textit{Non-core}}{\textit{Demand}}\right)_{i,t}$	2.341***	2.238**	0.423**	0.640***
	(0.856)	(0.947)	(0.191)	(0.234)
Instrument	$z_{i,t-12}$	$\sum_{k=0}^{12} z_{i,t-12-k}$	$z_{i,t-12}$	$\sum_{k=0}^{12} z_{i,t-12-k}$
Controls	✓	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
KP weak IV	14.46	22.09	9.70	21.86
Countries	41	41	153	153
Observations	12771	12771	37515	37515

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Conclusion

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- Findings highlight importance of macroprudential tools during monetary tightening
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    BIS (2014)

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  the funding structure of banking systems
- Findings highlight importance of macroprudential tools during monetary tightening
  - "The NSFR limits overreliance on short-term wholesale funding [...] and promotes funding stability"
    BIS (2014)
- New macro-financial dataset with three characteristics:
  high frequency, long horizon, extensive country coverage

References I

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Model (Drechsler et al., 2017)

- Problem of retail depositor:

$$\max_{W,M,D} U(W,\ell) = \left(W^{\frac{\rho-1}{\rho}} + (\lambda\ell)^{\frac{\rho-1}{\rho}}\right)^{\frac{\rho}{\rho-1}} \ , \ \rho \in (0,1)$$

$$s.t.$$

$$\ell(M,D) = \left(M^{\frac{\epsilon-1}{\epsilon}} + (\delta D)^{\frac{\epsilon-1}{\epsilon}}\right)^{\frac{\epsilon}{\epsilon-1}} \ , \ \epsilon > 1$$

$$W = W_0(1+r) - M\, r - D\, s$$

- Problem of monopoly bank:

$$\max_{s,H} \Pi = r\,B - \left(h_0 + \frac{h_1}{2}H\right)H - (r-s)D \ \ s.t.\ B = H + D$$

Back

Equilibrium

- For $\rho \to 1$ (as in Drechsler et al. (2017)):
  - $\frac{\partial D^*}{\partial r} < 0$
  - $\frac{\partial \frac{H^*}{D^*}}{\partial r} > 0$
- For $\rho \to 0$ (implying $U(W, \ell) = \min\{W, \lambda\ell\}$ and a strong IE):
  - $\frac{\partial D^*}{\partial r} > 0$
  - $\frac{\partial \frac{H^*}{D^*}}{\partial r} > 0$

Back

Prediction

- For $\rho \to 1$ (as in Drechsler et al. (2017)):
  - $\frac{\partial D^*}{\partial r} < 0$
  - $\boldsymbol{\frac{\partial \frac{H^*}{D^*}}{\partial r} > 0}$
- For $\rho \to 0$ (implying $U(W, \ell) = \min\{W, \lambda\ell\}$ and a strong income effect):
  - $\frac{\partial D^*}{\partial r} > 0$
  - $\boldsymbol{\frac{\partial \frac{H^*}{D^*}}{\partial r} > 0}$

Back

Characterizing a bank failure equilibrium

- Non-core lenders decide whether to run ($\theta = 1$) or stay ($\theta = 0$)
- Δ: unexpected change in interest rate
- NPV of bank assets:

$$\frac{1+r}{1+r+\Delta} \underbrace{B(r)}_{\text{LT investment}} + \underbrace{H(r+\Delta) - H(r)}_{\text{Inflow of H}} + \underbrace{D(r+\Delta) - D(r)}_{\text{Inflow of D}} - \underbrace{\theta H(r+\Delta)}_{\text{Run}}$$

- NPV of external liabilities:

$$\frac{1}{1+r+\Delta}\left[(1+r+\Delta-s)D(r+\Delta) + (1+h_0+\frac{h_1}{2}H(r+\Delta))(1-\theta)H(r+\Delta)\right]$$

- Coexistence of *'good'* and *'bad'* equilibrium if

$$sD(r+\Delta) \in \left[\Delta D(r) - \frac{(r-h_0)^2}{2h_1} - \frac{\Delta^2}{2h_1} \;,\; \Delta\frac{(r-h_0)}{h_1} + \Delta D(r)\right)$$

Back

Characterizing a bank failure equilibrium
Predictions

I. A non-degenerate interval where both solvency and run-induced insolvency co-exist is possible if $\Delta > 0$ and $H > 0$.

II. This interval widens as r or Δ increases.

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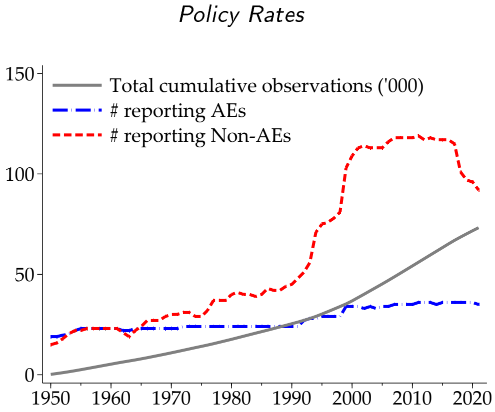
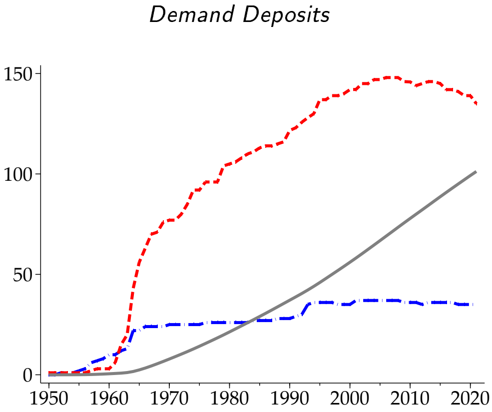
Overview of data availability of unbalanced panel





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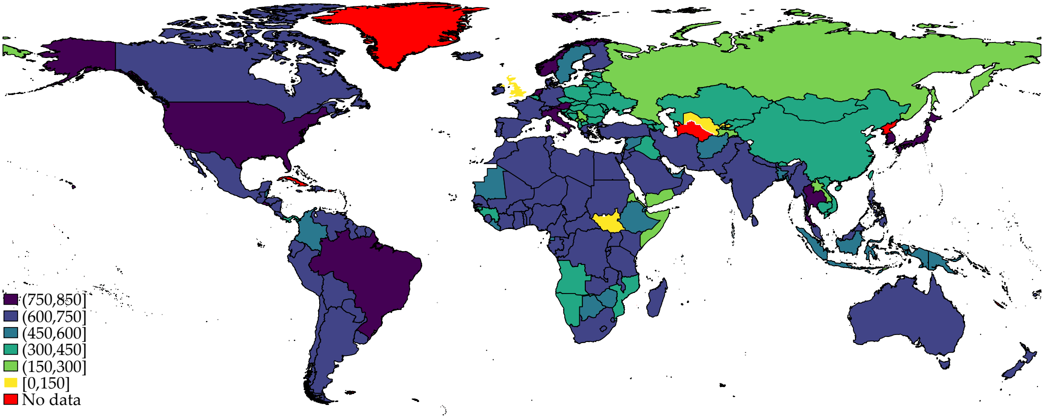
IFS: illustration of data coverage

Number of available data points for demand deposits



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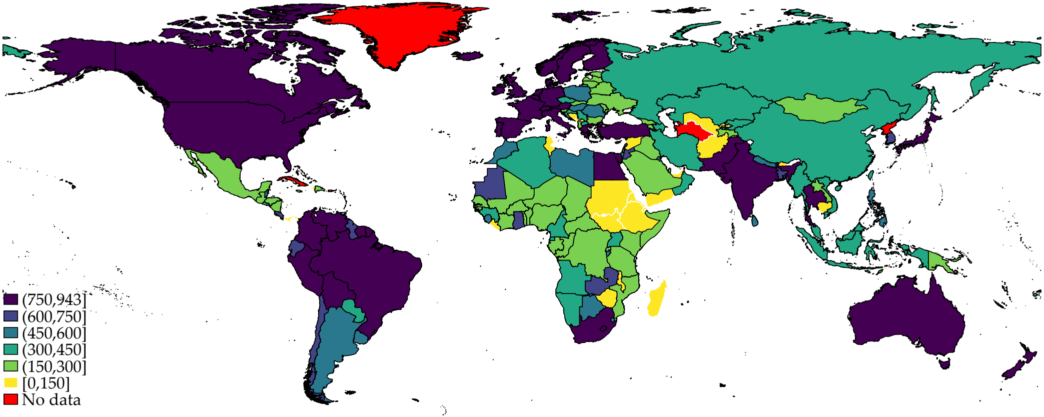
IFS: illustration of data coverage

Number of available data points for policy rates



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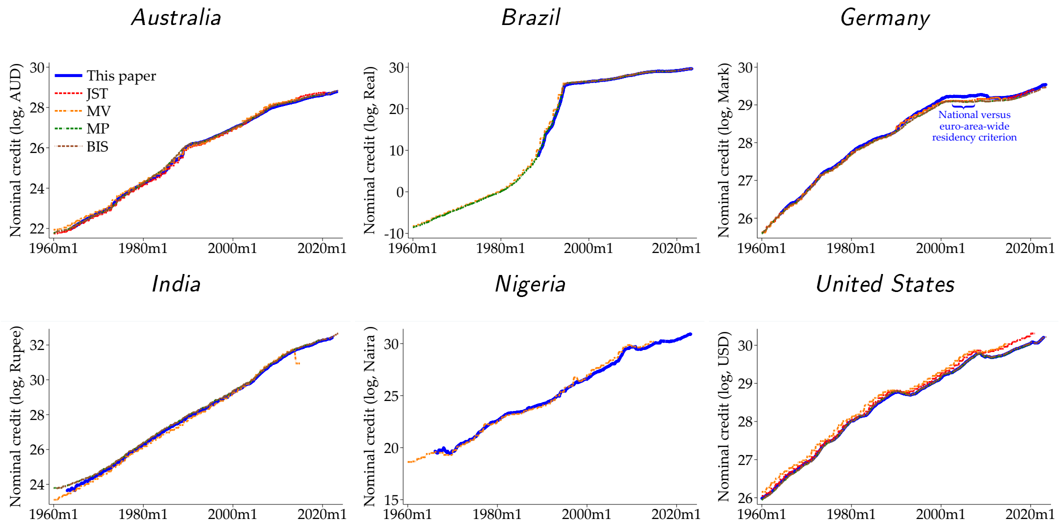
Private credit: comparison with other datasets



Notes: Data from this paper, Jordà et al. (2017), Müller and Verner (2024), Monnet and Puy (2021), and BIS.

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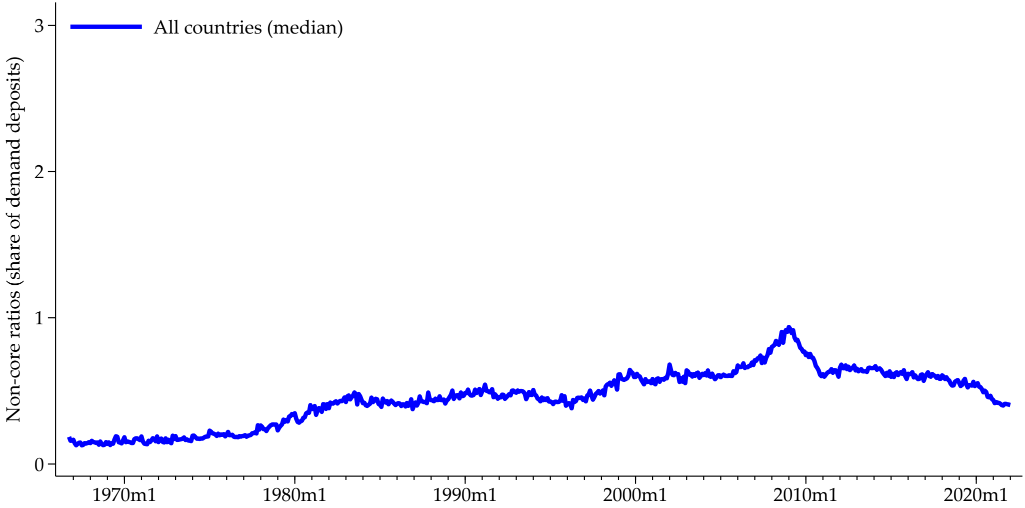
Non-core ratios over time



All positions

All positions, by income group

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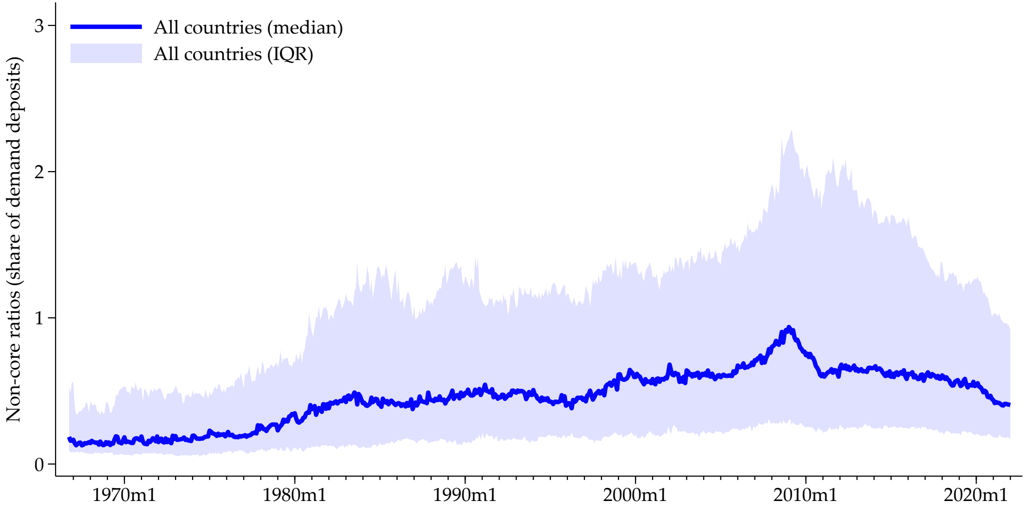
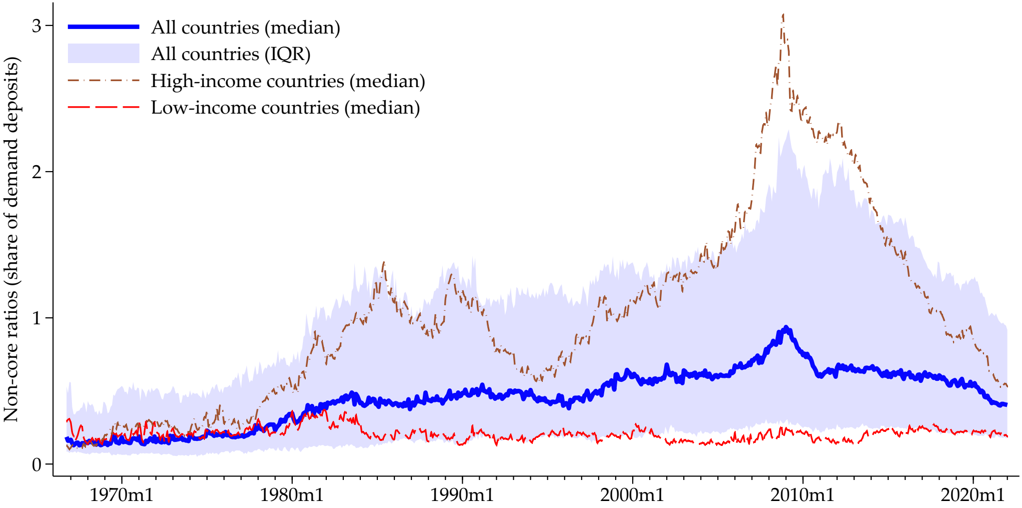
Non-core ratios over time



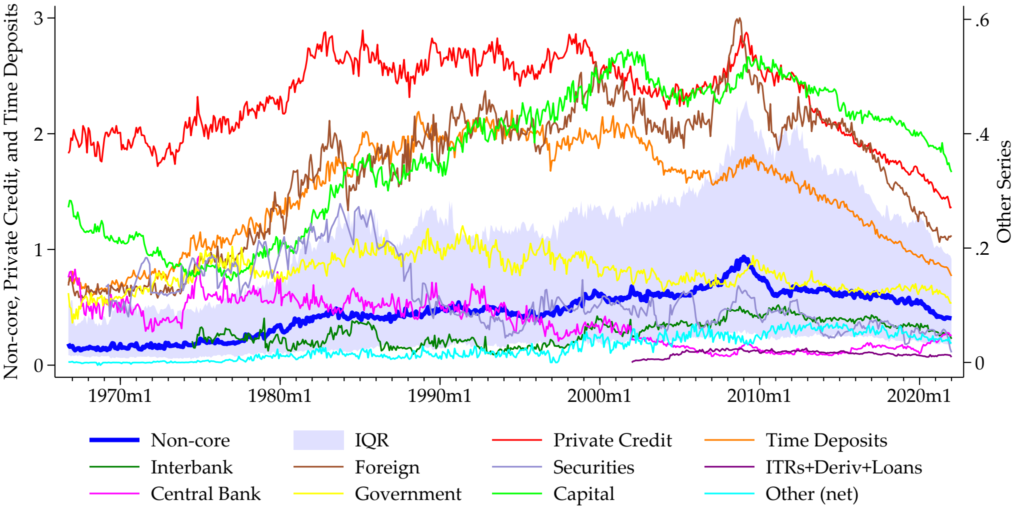
All positions All positions, by income group Back

Non-core ratios over time



All positions
All positions, by income group
Back

Balance sheet ratios over time



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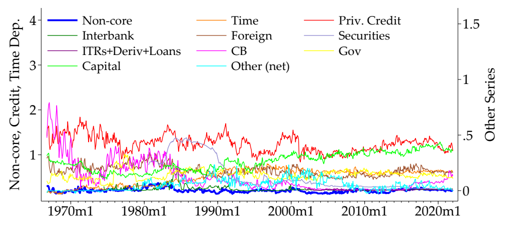
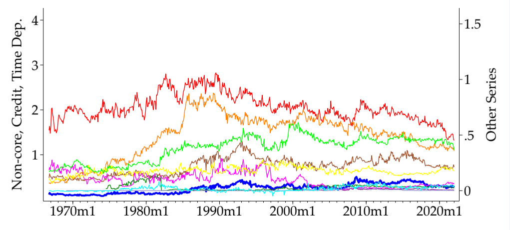
Balance sheet ratios over time: by income group

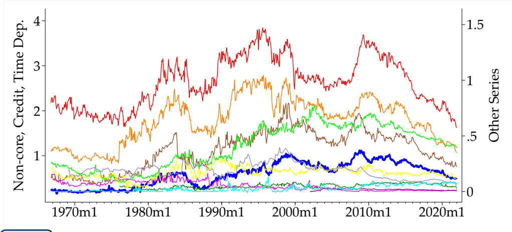
Low-income countries



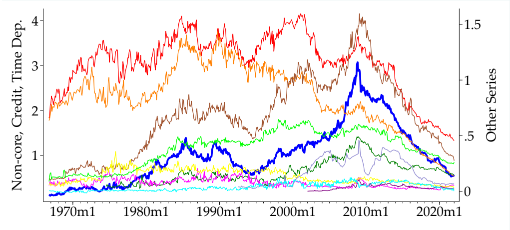
Lower middle-income countries



Upper middle-income countries



High-income countries



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Which policy rates?

IFS 'Monetary Policy-Related Interest Rate'[1]

If missing: IFS Discount Rate

If missing: IFS Refinancing Rate

If missing: IFS Central Bank Borrowing Facility Rate

If missing: BIS Central Bank Policy Rates Database

If missing: Digitization of National Central Bank Documents

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[1] "Central Bank Policy Rate is the target rate used by the central bank to conduct monetary policy. The monetary policy instrument varies across countries and is described in the Country Notes." (IMF, 2023a, p. 23)

Ex.: Central bank discount rates reported by the Bundesbank

7. Central Bank discount rates in foreign countries *)

Country	Rate on 31 December 1969: % p. a.	Rate on 31 December 1969: Applicable from	Previous rate: % p. a.	Previous rate: Applicable from
I. European countries				
1. EEC member countries				
Belgium-Luxembourg	7 ½	18 Sep. '69	7	31 July '69
France	8	9 Oct. '69	7	13 June '69
Italy	4	14 Aug. '69	3 ½	7 June '58
Netherlands	6	4 Aug. '69	5 ½	9 Apr. '69
2. EFTA member countries				
Austria	4 ¾	11 Sep. '69	3 ¾	27 Oct. '67
Denmark	9	12 May '69	7	31 Mar. '69
Norway	4 ½	27 Sep. '69	3 ½	14 Feb. '55
Portugal	2 ¾	8 Jan. '69	2 ½	1 Sep. '65
Sweden 1)	7	11 July '69	6	28 Feb. '69
Switzerland	3 ¾	15 Sep. '69	3	10 July '67
United Kingdom	8	27 Feb. '69	7	19 Sep. '68
3. Other European countries				
Finland	7	28 Apr. '62	8	30 Mar. '62
Greece	6 ½	15 Sep. '69	6	1 July '69
Iceland	5 ¼	1 Jan. '66	5	1 Jan. '65
Spain	5 ½	22 July '69	4 ½	27 Nov. '67
Turkey	7 ½	1 July '61	9	29 Nov. '60
II. Non-European industrial countries				
Canada	8	16 July '69	7 ½	11 June '69
Japan	6.25	1 Sep. '69	5.84	7 Aug. '68
New Zealand	7	23 Mar. '61	6	19 Oct. '59
South Africa	5 ½	27 Aug. '68	6	8 July '66
United States 2)	6	4 Apr. '69	5 ½	18 Dec. '68
III. Non-European developing countries				
Ceylon 3)	5 ½	May '68	5	28 May '65
Chile	19.09	1 Jan. '69	16.61	1 Jan. '68
Colombia	8	30 Apr. '63	7	11 Mar. '63
Costa Rica	5	Sep. '66	4	1 July '64
Ecuador	5	22 Nov. '56	6	19 July '51
El Salvador	4	24 Aug. '64	6	24 June '61
Ghana	5 ½	30 Mar. '68	6	8 May '67
India	5	4 Mar. '68	6	17 Feb. '65
Iran	8	7 Aug. '69	7	26 Nov. '68
Korea, South	23	1 Oct. '68	21	1 Mar. '68
Nicaragua	8	4 Feb. '65	6	1 Apr. '54
Pakistan	5	15 June '65	4	15 Jan. '59
United Arab Republic (Egypt)	5	15 May '62	3	13 Nov. '52

* Discount rates applied by central banks in transactions with commercial banks; excluding special terms for certain finance transactions (e. g., rediscount of export bills). — 1 Discount rate of the central bank in transactions with non-banks. Since 5 June 1952 the rate governing transactions with banks has been currently adapted to market conditions. — 2 Discount rate of the Federal Reserve Bank of New York. — 3 Rate for advances against government securities.

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Comparison of the crisis and panic chronologies

	Starting month of LV Crisis	Starting year of LV Crisis	Total
No BVX Panic month	16	21	24,794
BVX Panic month	26	33	70
Total	42	54	

LV Crisis: combination of "[s]ignificant signs of financial distress in the banking system" and "[s]ignificant banking policy intervention measures in response to significant losses in the banking system" Laeven and Valencia (2020, p. 310)

BVX Panic: "episodes of severe and sudden withdrawals of funding by bank creditors from a significant part of the banking system" Baron, Verner, and Xiong (2021, p. 53)

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Illustration of peggers' anchor countries

End-1975

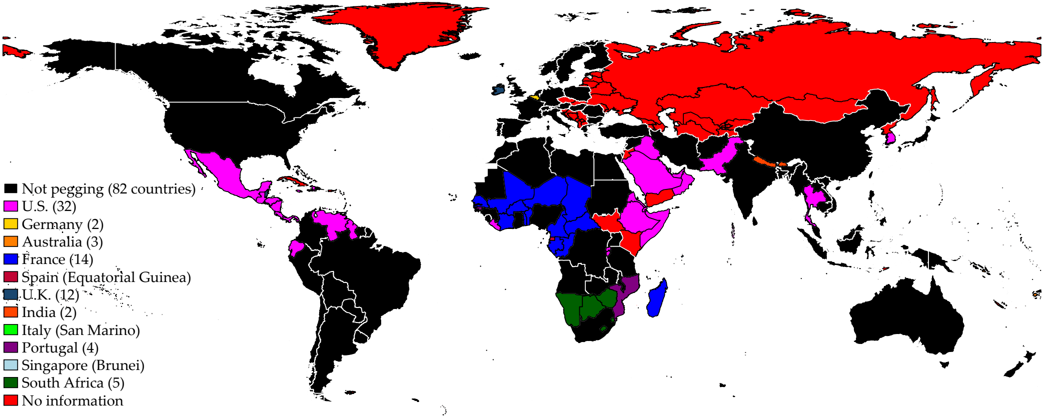
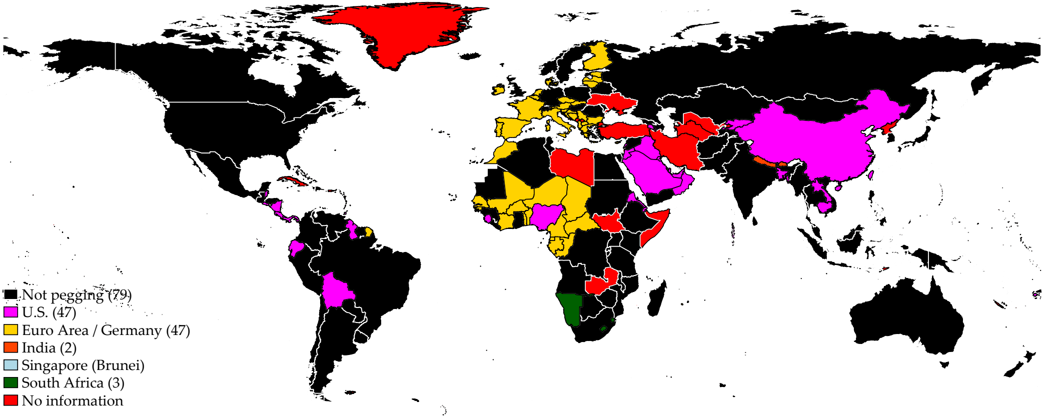


Illustration of peggers' anchor countries (ctd.)

End-2019



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Construction of the instrument

- $k_{i,t} \in [0,1]$: capital mobility indicator (1 if open)
- $q_{i,t} \in \{0,1\}$: ER regime indicator $\underbrace{(1 \text{ if peg in } t, t-1, \ldots, t-23)}_{\text{following Jordà et al. (2020)}}$
- $\Delta R^{policy}_{b(i,t),t}$: policy rate change in i's base country b in month t
- $\Delta \hat{R}^{policy}_{b(i,t),t}$: predicted changes in $\Delta R^{policy}_{b(i,t),t}$
  - Predictors: 12 lags of $\Delta R^{policy}_{b(i,t),t}$, CPI growth, and credit growth
- $z_{i,t} = \begin{cases} k_{i,t}\left(\Delta R^{policy}_{b(i,t),t} - \Delta \hat{R}^{policy}_{b(i,t),t}\right) & , q_{i,t} = 1 \\ 0 & , q_{i,t} = 0 \end{cases}$

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First stage for *advanced* economies

Dep. var.: $\Delta R_{i,t}^{policy}$	(1)	(2)	(3)	(4)
$z_{i,t}$	0.463***	0.632***	0.551***	0.446***
	(0.071)	(0.059)	(0.060)	(0.123)
Controls	✗	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	Year	Year $\times$ Month
KP weak IV	42.90	115.99	84.40	13.06
Countries	36	36	36	36
Observations	15907	12566	12566	12566

Back

First stage for *non-advanced* economies

Dep. var.: $\Delta R^{policy}_{i,t}$	(1)	(2)	(3)	(4)
$z_{i,t}$	0.151**	0.252***	0.215**	0.187**
	(0.071)	(0.085)	(0.086)	(0.088)
Controls	✗	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	Year	Year $\times$ Month
KP weak IV	4.56	8.75	6.28	4.57
Countries	121	118	118	118
Observations	30158	24196	24196	24196

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Floaters and peggers: response of policy rates

Dep. var.: $\Delta R^{policy}_{i,t}$	(1)	(2)	(3)	(4)
$z^{peg}_{i,t}$	0.268***	0.397***	0.363***	0.345***
	(0.058)	(0.065)	(0.064)	(0.078)
$z^{float}_{i,t}$	0.125	0.123	0.099	0.094
	(0.114)	(0.127)	(0.127)	(0.125)
Controls	✗	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	Year	Year × Month
KP weak IV	10.77	19.27	17.05	10.02
Countries	157	154	154	154
Observations	46065	36762	36762	36762

Notes: $\Delta R^{policy}_{i,t} = \alpha_i + \alpha_t + \gamma_1 z^{peg}_{i,t} + \gamma_2 z^{float}_{i,t} + \sum_{k=1}^{12} \delta^k \Delta R^{policy}_{i,t-k} + \mathbf{\Gamma} \boldsymbol{X}_{i,t} + e_{i,t}$.

$z^{peg}_{i,t} = \begin{cases} k_{i,t}\left(\Delta r_{b(i,t),t} - \Delta\hat{r}_{b(i,t),t}\right) & , q_{i,t} = 1 \\ 0 & , q_{i,t} = 0 \end{cases}$ and $z^{float}_{i,t} = \begin{cases} k_{i,t}\left(\Delta r_{b(i,t),t} - \Delta\hat{r}_{b(i,t),t}\right) & , q_{i,t} = 0 \\ 0 & , q_{i,t} = 1 \end{cases}$.

Back

Floaters and peggers: response of exchange rates

Dep. var.: $\Delta \log ER_{i,t+1}$	(1)	(2)	(3)	(4)
$z_{i,t}^{peg}$	0.039	-0.202	-0.001	0.096
	(0.169)	(0.202)	(0.186)	(0.163)
$z_{i,t}^{float}$	0.488***	0.463***	0.588***	0.561***
	(0.134)	(0.152)	(0.149)	(0.129)
Controls	✗	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	Year	Year × Month
KP weak IV	6.73	5.20	8.03	9.88
Countries	157	154	154	154
Observations	46022	36850	36850	36850

Notes: $\Delta \log ER_{i,t+1} = \alpha_i + \alpha_t + \gamma_1 z_{i,t}^{peg} + \gamma_2 z_{i,t}^{float} + \sum_{k=1}^{12} \delta^k \Delta R_{i,t-k}^{policy} + \boldsymbol{\Gamma X}_{i,t} + e_{i,t}$.

$$z_{i,t}^{peg} = \begin{cases} k_{i,t}\left(\Delta r_{b(i,t),t} - \Delta \hat{r}_{b(i,t),t}\right) & , q_{i,t} = 1 \\ 0 & , q_{i,t} = 0 \end{cases} \text{ and } z_{i,t}^{float} = \begin{cases} k_{i,t}\left(\Delta r_{b(i,t),t} - \Delta \hat{r}_{b(i,t),t}\right) & , q_{i,t} = 0 \\ 0 & , q_{i,t} = 1 \end{cases}.$$

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Ratios vis-à-vis total assets

	$\frac{\text{Non-core}}{\text{Total Assets}}$	$\frac{\text{Demand Deposits}}{\text{Total Assets}}$	$\frac{\text{Time Deposits}}{\text{Total Assets}}$	$\frac{\text{Total Deposits}}{\text{Total Assets}}$
$\Delta R^{policy}_{i,t}$	1.324***	-1.530***	-0.140	-1.542*
	(0.459)	(0.469)	(0.823)	(0.787)
Controls	✓	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
KP weak IV	46.34	46.64	42.19	45.64
Countries	152	152	149	152
Observations	31927	32625	31572	32090

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Ratios vis-à-vis total private deposits

	$\frac{\text{Demand Deposits}}{\text{Total Deposits}}$	$\frac{\text{Time Deposits}}{\text{Total Deposits}}$	$\frac{\text{Non-core}}{\text{Total Deposits}}$
$\Delta R_{i,t}^{policy}$	-8.943***	2.401**	7.611**
	(2.951)	(1.189)	(3.834)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	45.55	44.33	45.50
Countries	152	149	151
Observations	32702	32121	31443

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Additionally controlling for real activity

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities Demand Dep.	Non-core
$\Delta R^{policy}_{i,t}$	12.194***	-4.979	9.729***
	(3.530)	(3.184)	(2.894)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	43.78	55.41	43.31
Countries	91	92	92
Observations	13631	14418	14010

Notes: Monthly growth rates in real GDP from lag 0 to 12 are included as additional control variables.

Back

The effect of *contractionary* monetary policy on bank funding

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities Demand Dep.	Real Quantities Non-core
$\Delta R^{policy}_{i,t}$	36.585***	-21.580***	19.025*
	(13.705)	(7.516)	(11.139)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	23.47	25.75	22.71
Countries	151	152	152
Observations	31618	33307	31892

Notes: Here, I set $\Delta R_{i,t}$ to 0 whenever $\Delta R_{i,t} < 0$.

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The effect of *expansionary* monetary policy on bank funding

		Real Quantities	
	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Demand Dep.	Non-core
$\Delta R_{i,t}^{policy}$	26.412***	-14.255***	13.723**
	(6.826)	(4.489)	(6.196)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	24.11	30.51	23.11
Countries	151	152	152
Observations	31618	33307	31892

Notes: Here, I set $\Delta R_{i,t}$ to 0 whenever $\Delta R_{i,t} > 0$.

Back

No controls

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities	
		Demand Dep.	Non-core
$\Delta R^{policy}_{i,t}$	18.387**	-7.564***	7.779**
	(8.879)	(2.580)	(3.838)
Controls	✗	✗	✗
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	12.31	51.36	45.79
Countries	154	152	152
Observations	34718	34418	32544

Back

Including country×decade fixed effects

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities	
		Demand Dep.	Non-core
$\Delta R_{i,t}^{policy}$	12.967***	-6.129**	7.878**
	(3.905)	(2.609)	(3.372)
Controls	✓	✓	✓
Fixed effects	Ctry. × Dec.	Ctry. × Dec.	Ctry. × Dec.
KP weak IV	41.76	47.51	40.76
Countries	152	153	153
Observations	31619	33308	31893

Back

Including year fixed effects

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities Demand Dep.	Non-core
$\Delta R^{policy}_{i,t}$	12.059**	-6.792***	5.850
	(4.813)	(2.503)	(4.457)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	Year	Year	Year
KP weak IV	41.66	43.86	40.41
Countries	151	152	152
Observations	31618	33307	31892

Back

Including year×month fixed effects

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities Demand Dep.	 Non-core
$\Delta R_{i,t}^{policy}$	21.828***	-10.444**	9.494
	(7.975)	(4.085)	(6.109)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	Y × M	Y × M	Y × M
KP weak IV	15.30	17.76	15.74
Countries	151	152	152
Observations	31618	33307	31892

Back

With U.S. shocks

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities Demand Dep.	Non-core
$\Delta R^{policy}_{i,t}$	14.530***	-8.694***	7.003*
	(4.018)	(2.458)	(3.719)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	52.32	58.24	51.21
Countries	151	152	152
Observations	31618	33307	31892

Notes: Here, I add the Romer and Romer (2023) monetary policy shocks for the United States.

Back

Subset of advanced economies

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities Demand Dep.	Real Quantities Non-core
$\Delta R_{i,t}^{policy}$	11.671***	-7.215***	7.196***
	(2.683)	(2.382)	(2.609)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	83.17	131.22	89.46
Countries	35	35	36
Observations	10410	11251	10799

Notes: Here, the model is re-estimated for the subset of advanced economies. The country classification follows IMF (2023b, pp. 119–120).

Back

Subset of Baron et al. (2021) countries

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities	
		Demand Dep.	Non-core
$\Delta R_{i,t}^{policy}$	11.240***	-4.752**	8.845***
	(2.594)	(2.155)	(2.493)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	54.68	88.55	34.21
Countries	41	42	42
Observations	12276	13420	12652

Notes: Here, the model is re-estimated for the subset of countries for which the Baron et al. (2021) banking panic chronology is available.

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Subset of non-advanced economies

		Real Quantities	
	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Demand Dep.	Non-core
$\Delta R_{i,t}^{policy}$	15.295*	-11.582**	4.276
	(8.535)	(5.454)	(7.619)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	15.66	12.25	16.10
Countries	116	117	116
Observations	21208	22056	21093

Notes: Here, the model is re-estimated for the subset of non-advanced economies. The country classification follows IMF (2023b, pp. 119–120).

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Subset of pegging countries

		Real Quantities	
	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Demand Dep.	Non-core
$\Delta R_{i,t}^{policy}$	14.345***	-7.336***	7.732**
	(4.037)	(2.544)	(3.689)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	43.62	55.43	43.14
Countries	99	100	99
Observations	13063	13772	12964

Notes: Here, the model is re-estimated for the subset of countries that peg their currency to a base country according to Ilzetzki et al. (2019, 2022).

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Additionally controlling for the VIX Index

	Non-core / Demand Dep.	Real Quantities	
		Demand Dep.	Non-core
$\Delta R_{i,t}^{policy}$	17.479***	-8.457***	10.228***
	(4.628)	(3.174)	(3.913)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	37.12	40.04	35.67
Countries	149	150	150
Observations	24669	25772	24893

Notes: Monthly changes in the log-transformed VIX Index are included as additional control variables.

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Response of Net Interest Margins

	Lending Rate-Time Dep. Rate	Lending Rate-Interbank Rate
$\Delta R_{i,t}^{policy}$	-0.850	-2.602***
	(0.891)	(0.966)
Controls	✓	✓
Country FEs	✓	✓
Time FEs	✗	✗
KP weak IV	12.67	16.05
Countries	138	85
Observations	21586	12635

Notes: Here, the dependent variable refers to the difference between lending and time deposit rates (first column) or interbank rates (second column).

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Response of Time Deposit & Interbank Spreads

	Time Dep. Rate	Time Dep. Spread	Interbank Rate	Interbank Spread
$\Delta R_{i,t}^{policy}$	2.604*	-1.262	7.586***	-2.143*
	(1.388)	(4.781)	(2.358)	(1.126)
Controls	✓	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
KP weak IV	16.93	4.59	9.93	19.12
Countries	145	144	94	93
Observations	24680	23761	16516	15837

Notes: The dependent variable in column (2) refers to the difference between policy and time deposit rates. The dependent variable in column (4) refers to the difference between policy and interbank rates.

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Individual non-core positions—*Foreign Liabilities*

	Real		Ratio to Demand Deposits	
	All	AEs	All	AEs
$\Delta R^{policy}_{i,t}$	11.670**	4.395	18.244***	10.675***
	(5.106)	(3.061)	(5.529)	(3.097)
Controls	✓	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
KP weak IV	42.32	93.45	46.97	89.22
Countries	152	36	151	35
Observations	33344	11233	32542	10847

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Individual non-core positions—*Interbank Liabilities*

	Real		Ratio to Demand Deposits	
	All	AEs	All	AEs
$\Delta R^{policy}_{i,t}$	19.828	10.032	19.533*	12.850*
	(12.113)	(6.377)	(11.436)	(7.034)
Controls	✓	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
KP weak IV	30.77	421.85	28.37	417.83
Countries	137	33	137	33
Observations	20649	5270	20269	5205

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Individual non-core positions—*Security Liabilities*

	Real		Ratio to Demand Deposits	
	All	AEs	All	AEs
$\Delta R_{i,t}^{policy}$	6.696	12.707**	13.304**	18.015***
	(6.596)	(6.202)	(6.709)	(6.250)
Controls	✓	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
KP weak IV	29.72	68.06	33.56	61.47
Countries	113	32	113	32
Observations	16711	6696	16506	6612

Back

Individual non-core positions—*Derivative and Loan Liabilities*

	Real		Ratio to Demand Deposits	
	All	AEs	All	AEs
$\Delta R^{policy}_{i,t}$	16.251	23.450*	17.876	28.318*
	(22.272)	(14.213)	(24.144)	(16.902)
Controls	✓	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
KP weak IV	25.43	283.60	25.44	285.92
Countries	114	32	114	32
Observations	11874	3503	11858	3503

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Response of other balance sheet positions

	Real Time Dep.	Real CB Res.	Real CB Liab.	Real Gov. Liab.
$\Delta R_{i,t}^{policy}$	2.571	-22.862*	-4.481	14.077
	(2.294)	(11.812)	(29.124)	(8.577)
Controls	✓	✓	✓	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
KP weak IV	44.92	48.95	32.69	47.16
Countries	149	153	143	148
Observations	32370	33891	25750	30588

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$\Delta_{12} R^{policy}$

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities	
		Demand Dep.	Non-core
$\Delta_{12} R^{policy}_{i,t}$	6.463***	-2.783***	3.989**
	(1.923)	(0.830)	(1.856)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	34.92	27.33	34.98
Countries	152	152	152
Observations	28634	30002	28882

Notes: Here, $\Delta_{12} R^{policy}_{i,t}$ is instrumented with $\sum_{k=0}^{11} z_{i,t-k}$.

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Without EA countries

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities Demand Dep.	Non-core
$\Delta R_{i,t}^{policy}$	17.380***	-12.429***	6.792
	(5.954)	(3.826)	(5.148)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	26.98	28.38	26.19
Countries	148	149	149
Observations	29533	30899	29807

Notes: Here, countries are excluded from the date onwards when they joined the Euro Area.

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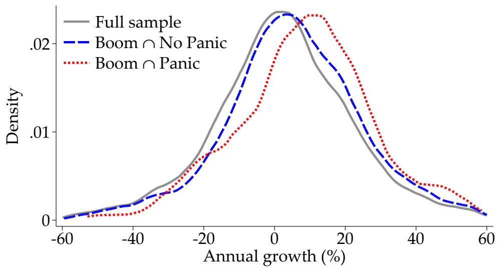
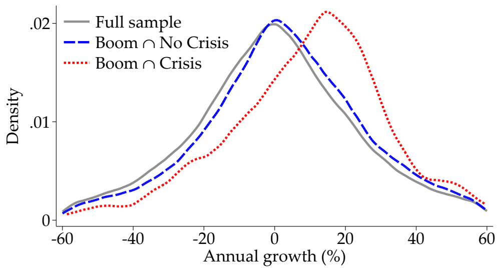
Alternative credit boom definition: HP filter

Non-core ratio before panics



Non-core ratio before crises



Notes: Real private credit is detrended based on a two-sided HP filter with $\lambda = 129,600$. An economy is *booming* when detrended real private credit is positive.

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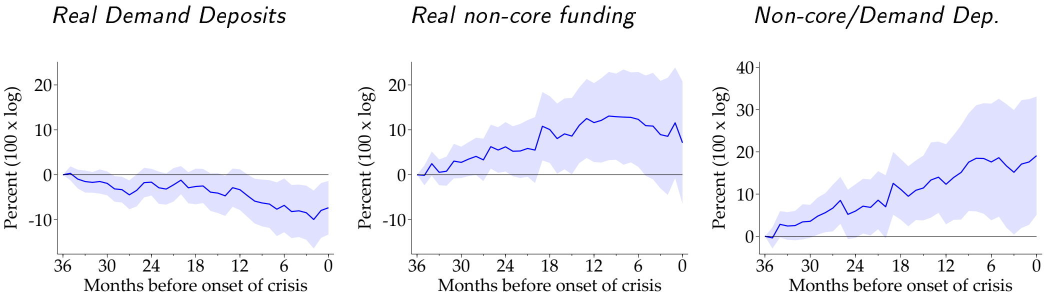
Pre-crisis paths of bank funding

Assumption: crisis starts in January whenever LV do not pin down month



Notes: Estimates of $\{\beta^h\}_{h=0}^{36}$ with 95% CIs of $y_{i,t-36+h} - y_{i,t-36} = \alpha_i^h + \beta^h \mathbb{1}\{\textbf{crisis}_{i,t} = 1\} + e_{i,t-36+h}$. y is log-transformed for all variables. Bottom-right panel shows estimates of $\{\beta^h\}_{h=0}^{36}$ with 95% CIs of $\sum_{k=0}^{h} \Delta \widehat{R^{policy}_{i,t-36+k}} = \alpha_i^h + \beta^h \mathbb{1}\{\textbf{crisis}_{i,t} = 1\} + e_{i,t-36+h}$.

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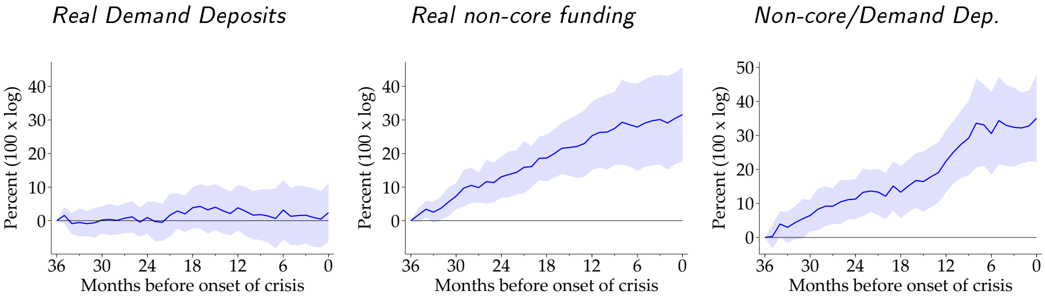
Pre-crisis paths of bank funding (ctd.)

Assumption: crisis does not exist whenever LV do not pin down month



Notes: Estimates of $\{\beta^h\}_{h=0}^{36}$ with 95% CIs of $y_{i,t-36+h} - y_{i,t-36} = \alpha_i^h + \beta^h \mathbb{1}\{\textbf{crisis}_{i,t} = 1\} + e_{i,t-36+h}$. y is log-transformed for all variables. Bottom-right panel shows estimates of $\{\beta^h\}_{h=0}^{36}$ with 95% CIs of $\sum_{k=0}^{h} \Delta \widehat{R_{i,t-36+k}^{policy}} = \alpha_i^h + \beta^h \mathbb{1}\{\textbf{crisis}_{i,t} = 1\} + e_{i,t-36+h}$.

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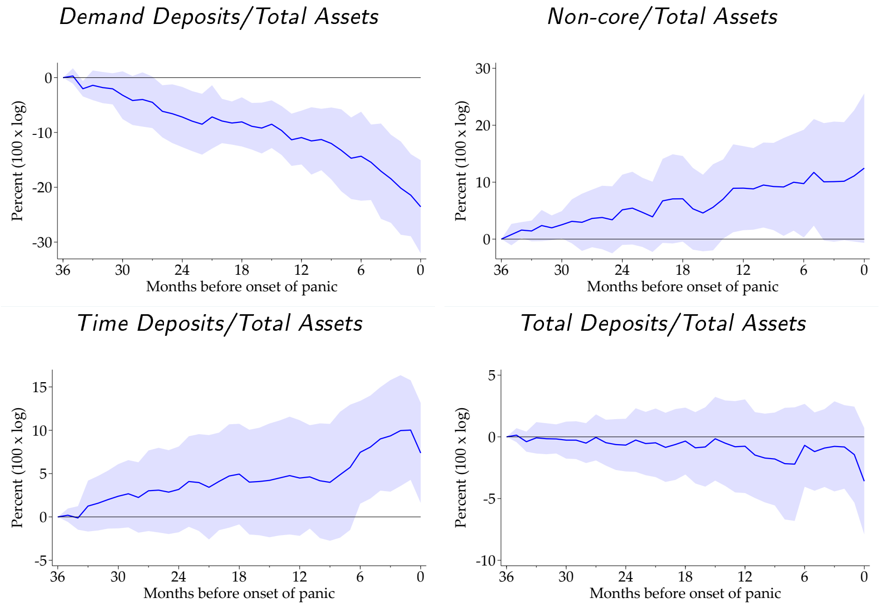
Pre-panic paths relative to total assets



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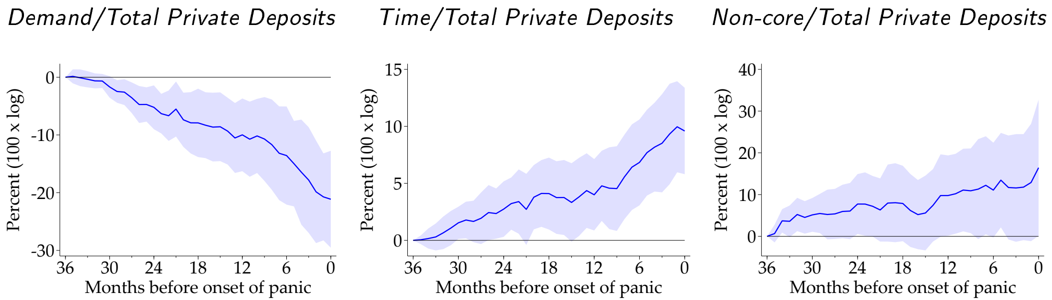
Pre-panic paths relative to total deposits



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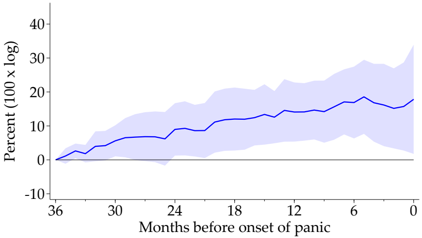
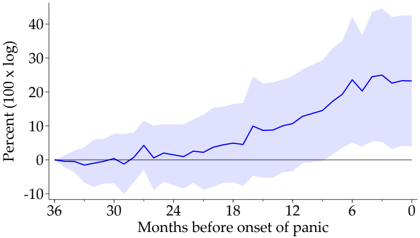
Pre-panic paths of non-core components

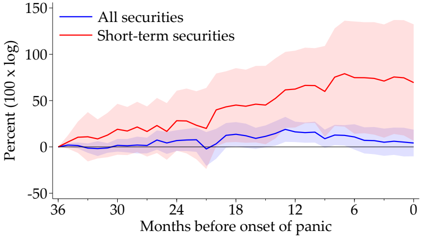
Real Foreign Liabilities



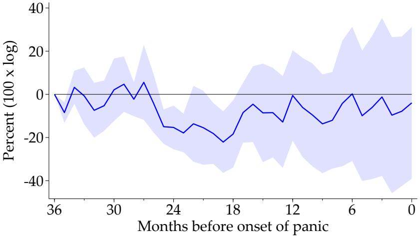
Real Interbank Liabilities



Real Securities



Real Loans and Derivatives



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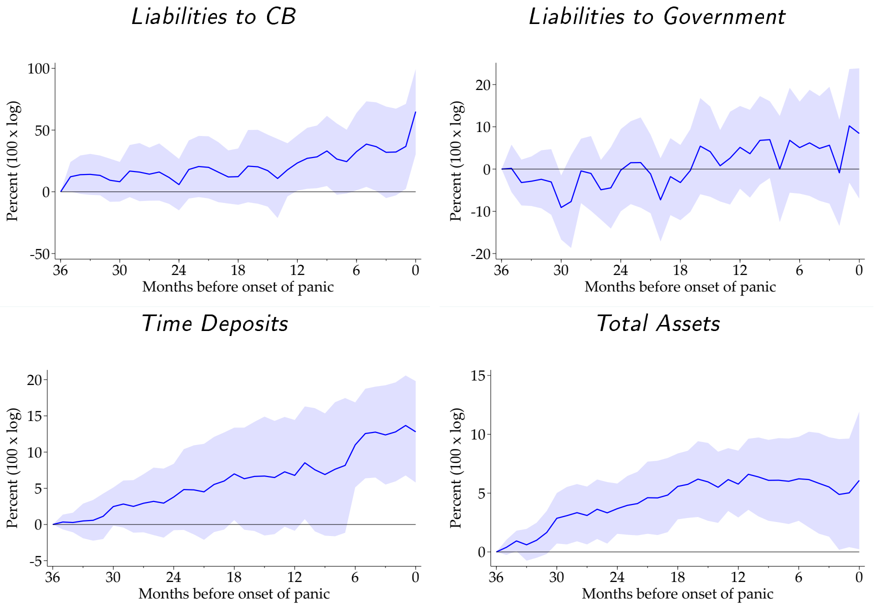
Pre-panic paths of other balance sheet positions



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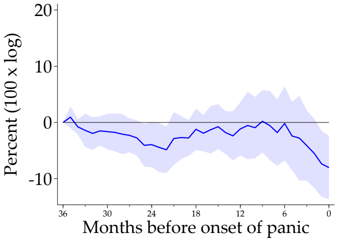
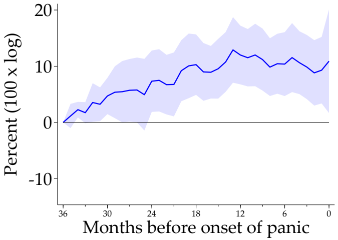
Including country×decade fixed effects

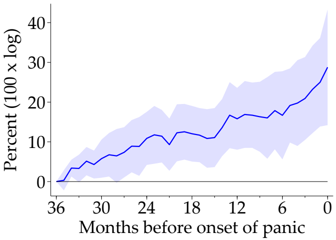
Real Demand Deposits



Real non-core funding



Non-core/Demand Deposits



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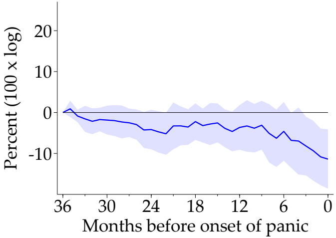
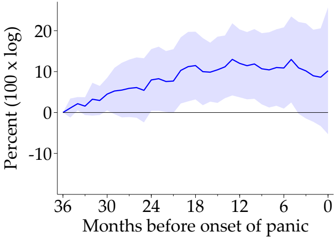
Including year fixed effects

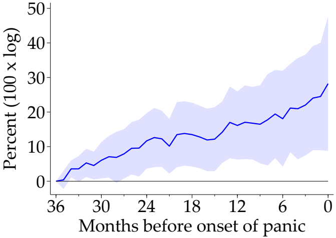
Real Demand Deposits



Real non-core funding



Non-core/Demand Deposits



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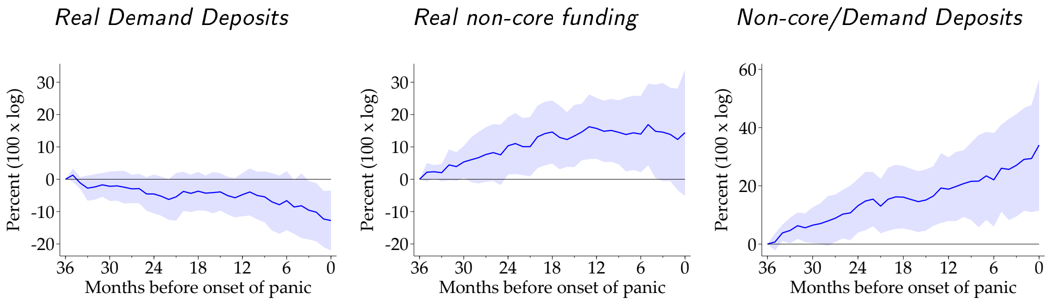
Including year×month fixed effects



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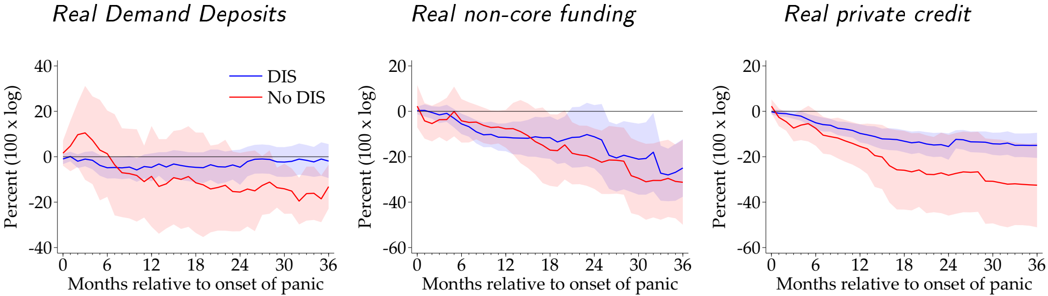
Paths after banking panics



Notes: Estimates of $\{\beta^h\}_{h=0}^{36}$ and $\{\gamma^h\}_{h=0}^{36}$ with 90% CIs of $y_{i,t+h} - y_{i,t} = \alpha_i^h + \beta^h \mathbb{1}\{\text{panic}_{i,t} = 1\}\mathbb{1}\{DIS_{i,t} = 1\} + \gamma^h \mathbb{1}\{\text{panic}_{i,t} = 1\}\mathbb{1}\{DIS_{i,t} = 0\} + e_{i,t+h}$. Information on the presence of explicit DISs comes from Demirgüç-Kunt et al. (2014).

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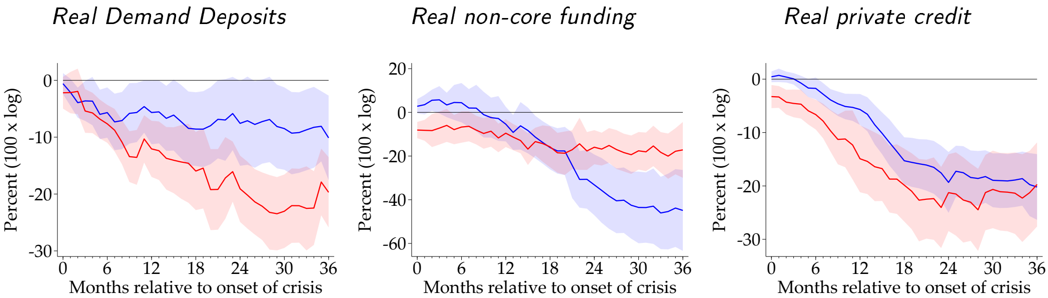
Paths after financial crises



Notes: Estimates of $\{\beta^h\}_{h=0}^{36}$ and $\{\gamma^h\}_{h=0}^{36}$ with 90% CIs of $y_{i,t+h} - y_{i,t} = \alpha_i^h + \beta^h \mathbb{1}\{\textbf{crisis}_{i,t} = 1\}\mathbb{1}\{DIS_{i,t} = 1\} + \gamma^h \mathbb{1}\{\textbf{crisis}_{i,t} = 1\}\mathbb{1}\{DIS_{i,t} = 0\} + e_{i,t+h}$. Information on the presence of explicit DISs comes from Demirgüç-Kunt et al. (2014).

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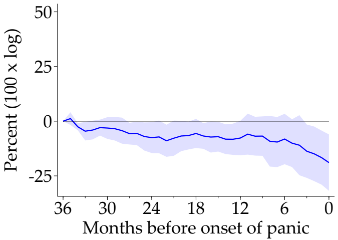
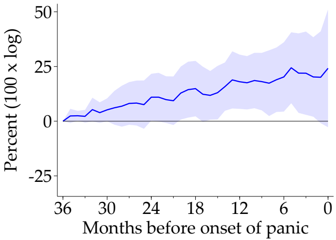
Excluding the years 2007 & 2008

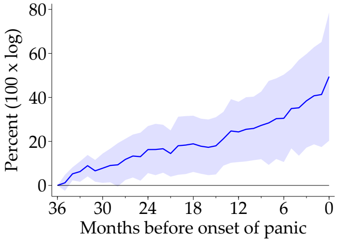
Real Demand Deposits



Real non-core funding



Non-core/Demand Deposits



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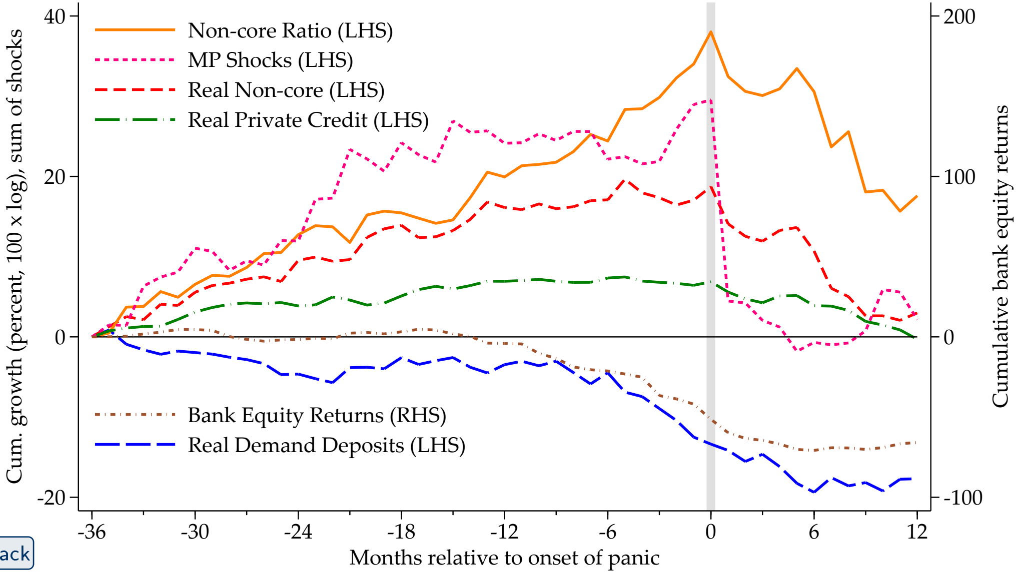
Pre- and post-panic comparison of all relevant b/s variables



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Predicting banking panics and financial crises: framework

$$\log\left(\frac{p_{i,t+1}}{1-p_{i,t+1}}\right) = \alpha_i + \beta\,\Delta_{36}\left(\log\frac{Non-core}{Demand}\right)_{i,t} + \boldsymbol{\Gamma}\boldsymbol{X}_{i,t} + u_{i,t+1}$$

- $p_{i,t+1}$: prob. that crisis or panic starts in year-month $t+1$
- $\boldsymbol{X}$: 36-month changes in same controls as before
- Following: ML estimates of 100β with country-based cluster-robust SEs

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Predicting banking panics and financial crises: results

	Banking panics		Financial crises	
	(1)	(2)	(3)	(4)
$\Delta_{36}\left(\log \frac{Non\text{-}core}{Demand}\right)_{i,t}$	0.214***	0.219***	0.094***	0.099***
	(0.030)	(0.028)	(0.027)	(0.031)
Controls	✗	✓	✗	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
Countries	33	31	76	60
Observations	11332	10242	28601	21618
AUROC	0.73	0.72	0.66	0.68
p-value	0.00	0.01	0.00	0.17

Notes: Marginal effects evaluated at the sample means of the covariates. Indep. variables are normalized. Last line: DeLong et al. (1988) test of equality of ROC areas vis-à-vis a model that excludes $\Delta_{36}\left(\log \frac{Non-core}{Demand}\right)$.

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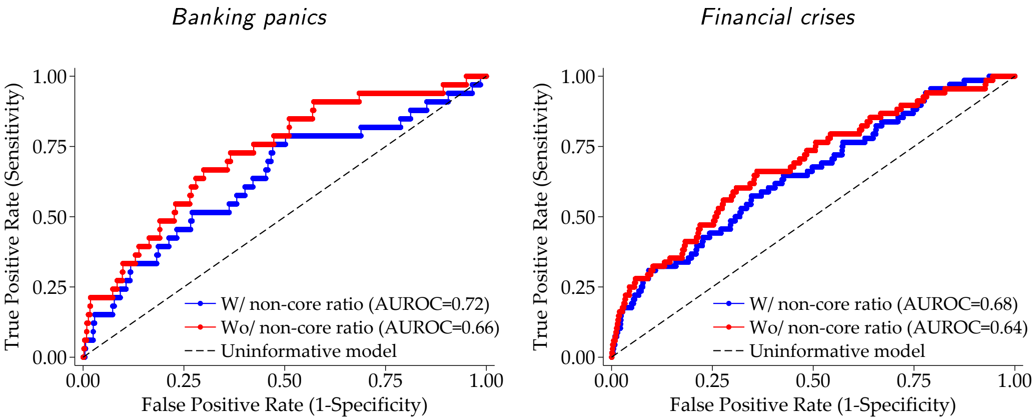
Predicting banking panics and financial crises: ROC curves



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Beyond narratively identified panics & crises

Framework

$$y_{t+12} = \alpha_i + \beta \Delta_{36} \left(\log \frac{Non - core}{Demand} \right)_{i,t} + \mathbf{\Gamma} \boldsymbol{X}_{i,t} + u_{i,t+1}$$

- $\boldsymbol{X}$: 36-months changes in same controls as before and $\Delta_{36} y_{i,t}$
- Following: ML (if y binary) or OLS (if y continuous) estimates of **100**β and β

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Beyond narratively identified panics & crises

Shift towards non-core funding predicts non-core runs ...

	$\Delta_{12}\left(\log \text{Real Non-core}\right)_{i,t+12}$		$\mathbb{1}\{\Delta_{12}\left(\text{Real Non-core}\right)_{i,t+12} < 10^{th} perc.\}$	
	(1)	(2)	(3)	(4)
$\Delta_{36}\left(\log \frac{\textit{Non-core}}{\textit{Demand}}\right)_{i,t}$	-3.345***	-4.849***	1.187***	1.281***
	(0.765)	(0.811)	(0.273)	(0.270)
Estimation	OLS	OLS	Logit	Logit
Controls	✗	✓	✗	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
Countries	185	182	159	157
Observations	56643	54326	49589	47927

Notes: Columns (3) and (4): marginal effects evaluated at the sample means of the covariates. Indep. variables are normalized.

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Beyond narratively identified panics & crises

...and credit busts ...

	Δ_{12} (log Real Priv. Credit)$_{i,t+12}$ (1)	(2)	$\mathbb{1}\{\Delta_{12}$ (Real Priv. Credit)$_{i,t+12} < 10^{th}$*perc.*$\}$ (3)	(4)
$\Delta_{36}\left(\log \frac{\textit{Non-core}}{\textit{Demand}}\right)_{i,t}$	-0.593**	-0.632**	1.382***	1.193***
	(0.294)	(0.272)	(0.322)	(0.320)
Estimation	OLS	OLS	Logit	Logit
Controls	✗	✓	✗	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
Countries	185	181	158	156
Observations	56012	55473	50129	49767

Notes: Columns (3) and (4): marginal effects evaluated at the sample means of the covariates. Indep. variables are normalized.

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Beyond narratively identified panics & crises

. . . and real disasters. . .

	Δ_{12} (log Real GDP)$_{i,t+12}$		$\mathbb{1}\{\Delta_{12}$ (Real GDP)$_{i,t+12} < 10^{th}$ *perc.*$\}$	
	(1)	(2)	(3)	(4)
$\Delta_{36}\left(\log \frac{\textit{Non-core}}{\textit{Demand}}\right)_{i,t}$	-0.856***	-0.926***	2.061***	1.071*
	(0.248)	(0.265)	(0.624)	(0.593)
Estimation	OLS	OLS	Logit	Logit
Controls	✗	✓	✗	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
Countries	102	100	100	98
Observations	18154	17728	18082	17656

Notes: Columns (3) and (4): marginal effects evaluated at the sample means of the covariates. Indep. variables are normalized.

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Beyond narratively identified panics & crises

. . . but *not* withdrawals of retail deposits

	Δ_{12} (log Real Demand)$_{i,t+12}$		$\mathbb{1}\{\Delta_{12}$ (Real Demand)$_{i,t+12} < 10^{th}$*perc.*$\}$	
	(1)	(2)	(3)	(4)
$\Delta_{36}\left(\log \frac{\textit{Non-core}}{\textit{Demand}}\right)_{i,t}$	-0.025	-0.338	0.114	0.261
	(0.286)	(0.308)	(0.359)	(0.373)
Estimation	OLS	OLS	Logit	Logit
Controls	✗	✓	✗	✓
Country FEs	✓	✓	✓	✓
Time FEs	✗	✗	✗	✗
Countries	185	181	173	171
Observations	56094	55036	54486	53451

Notes: Columns (3) and (4): marginal effects evaluated at the sample means of the covariates. Indep. variables are normalized.

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Bank funding shifts coincide with weakening fundamentals...

Dep. var.: Cum. Bank Equity Returns	from t to $t+12$	from $t-36$ to t
$\Delta_{36}\left(\log \frac{\textit{Non-core}}{\textit{Demand}}\right)_{i,t}$	-2.779	-14.376***
	(1.865)	(5.167)
Controls	✓	✓
Country FEs	✓	✓
Time FEs	✗	✗
Countries	40	40
Observations	11009	11009

Notes: OLS estimates of $R^{equity}_{i,t} = \alpha_i + \beta\,\Delta_{36}\left(\log \frac{\textit{Non-core}}{\textit{Demand}}\right)_{i,t} + \mathbf{\Gamma}\,\boldsymbol{X}_{i,t} + u_{i,t}$ $\boldsymbol{X}$ includes the same controls as in the main part. In the first column, $\boldsymbol{X}$ additionally controls for cumulative bank equity return from year-month $t-36$ to t. The independent variables are normalized.

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. . . but bank fundamentals cannot explain my findings

	$\frac{\text{Non-core}}{\text{Demand Dep.}}$	Real Quantities Demand Dep.	Non-core
$\Delta R^{policy}_{i,t}$	7.080***	-3.850**	6.295***
	(2.443)	(1.895)	(2.183)
Controls	✓	✓	✓
Country FEs	✓	✓	✓
Time FEs	✗	✗	✗
KP weak IV	45.08	74.51	48.71
Countries	40	41	41
Observations	10764	11728	11132

Notes: Lags 0 to 12 of monthly bank equity returns are included as additional control variables.

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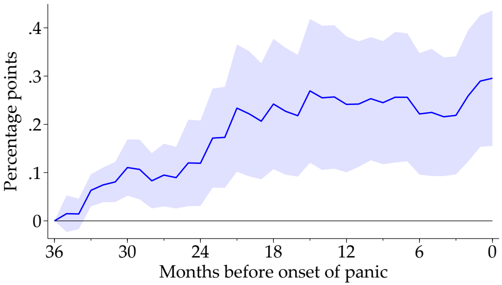
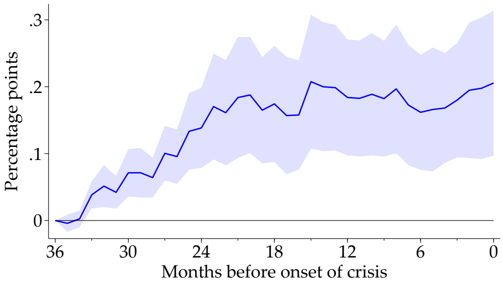
Before panics and crises, monetary policy tightens

Shocks before panics



Shocks before crises



Notes: OLS estimates of $\{\beta^h\}_{h=0}^{36}$ of $\sum_{k=0}^{h} z_{i,t-36+k} = \alpha_i^h + \beta^h \mathbb{1}\{event_{i,t} = 1\} + e_{i,t-36+h}$. Shaded areas: 95% confidence intervals based on country-based cluster-robust standard errors.

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Relative frequency tables

Relative frequencies conditional on $panic_{i,t+1,t+12} = 0$

	$\Delta_{12}\left(\frac{Non\text{-}core}{Demand}\right)_{i,t} \leq 0$	$\Delta_{12}\left(\frac{Non\text{-}core}{Demand}\right)_{i,t} > 0$
$\Delta R^{policy}_{i,t-12} < 0$	30.82	23.45
$\Delta R^{policy}_{i,t-12} > 0$	17.39	28.34

Relative frequencies conditional on $panic_{i,t+1,t+12} = 1$

	$\Delta_{12}\left(\frac{Non\text{-}core}{Demand}\right)_{i,t} \leq 0$	$\Delta_{12}\left(\frac{Non\text{-}core}{Demand}\right)_{i,t} > 0$
$\Delta R^{policy}_{i,t-12} < 0$	19.34	20.99
$\Delta R^{policy}_{i,t-12} > 0$	16.57	43.09

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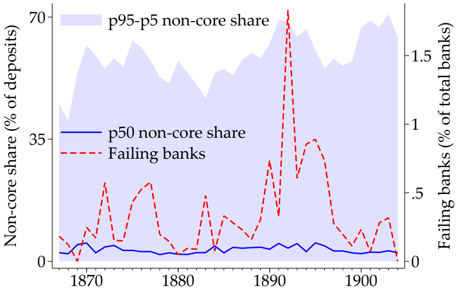
A confirmation at the bank level

- **National Banking era**: balance sheet data for all National Banks
  Carlson et al. (2022); Correia and Luck (2023)

1867–1904



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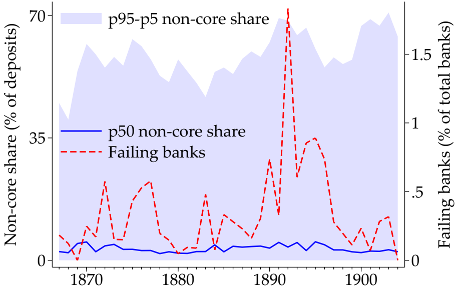
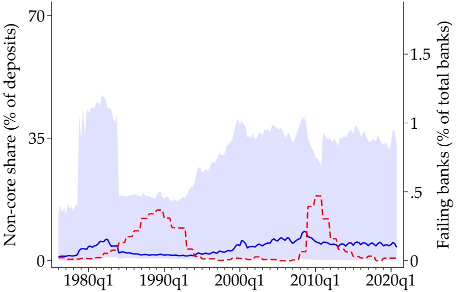
A confirmation at the bank level

- **National Banking era**: balance sheet data for all National Banks
  Carlson et al. (2022); Correia and Luck (2023)
- **1976Q1–2020Q4**: Call Reports for U.S. Commercial Banks

1867–1904



1976Q1–2020Q4



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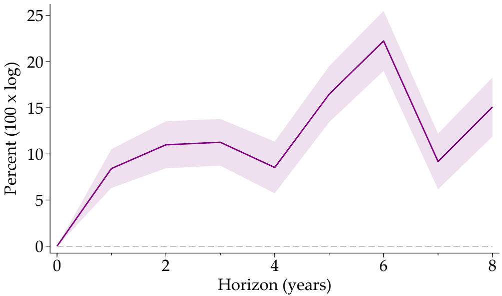
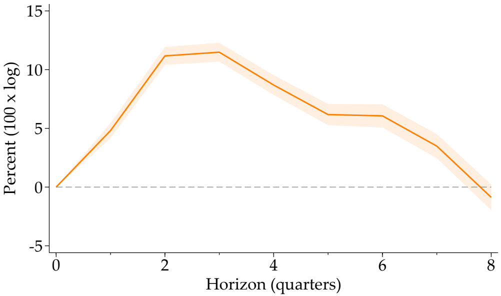
Monetary tightening raises non-core shares of banks

1867–1904



1976Q1–2020Q4



Notes: 2SLS (left panel) and OLS (right) estimates of $\{\beta^h\}_{h=1}^{8}$ with bank-based cluster-robustness SEs of $\Delta_h \left(\log \frac{\text{Non-core}}{\text{Deposits}}\right)_{b,t+h} = \alpha_b^h + \beta^h \Delta R_t + \sum_{k=1}^{4} \gamma_k^h \Delta R_{t-k} + \sum_{k=0}^{4} \delta_k^h \Delta \left(\log \frac{\text{Non-core}}{\text{Deposits}}\right)_{b,t-k} + \mathbf{\Gamma} \boldsymbol{X}_{b,t} + e_{b,t+h}$. Left panel: R refers to U.S. short-term rates, which are instrumented with residualized interest rate changes in the U.K. Right panel: ΔR refers to Romer and Romer (2023) MP shocks. α_b: Bank FEs. $\boldsymbol{X}$: log real total assets and lags 0 to 4 of first-differenced log real total assets, log real total deposits, and log real non-core funding.

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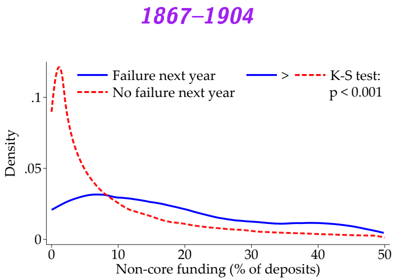
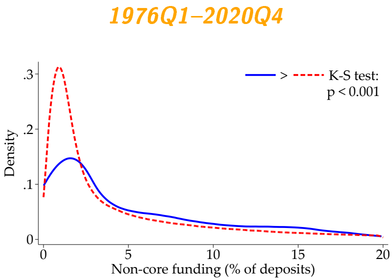
Higher non-core shares predict higher bank failure risk





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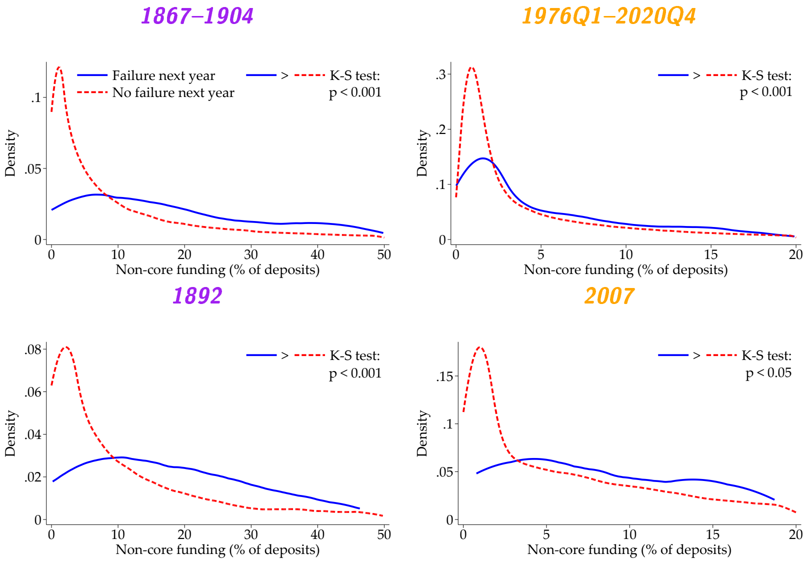
Higher non-core shares predict higher bank failure risk



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