Who Bears the Burden of Bank Capital Regulation?

Buffers, Risk Weights, and the Supply of Credit

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Job Market Paper

Motivation

Post-crisis capital regulation is deliberately differentiated:

- Risk weights: C&I loans $\omega_B = 1.00$ vs. mortgages $\omega_M = 0.50$
- Size tiers: surcharges at \$10B and \$50B asset thresholds

Central policy question:

Who bears the burden of a capital requirement tightening?

- Which **sectors** absorb the contraction in credit?
- Which **banks** transmit it?
- What is the **aggregate cost**—and does design matter for it?

This Paper: Preview of the Answer

Empirically (Call Reports, 4,800 banks, 1994–2019):

- **Within banks:** C&I lending contracts $\sim$40% more than RE lending (risk-weight wedge)
- **Across banks:** thin-buffer institutions cut lending most (buffer gradient 1.29$\times$)
- Consumer credit: no response at any horizon (placebo)

Structurally (heterogeneous macro-banking model, neural-network solution, SMM):

- Reproduces sign, ordering, hump-shape, and buffer gradient (1.23$\times$, untargeted)
- $+$1pp tightening costs 2.4–2.9% of credit-market surplus
- Risk weights and size tiers redistribute the burden but barely change its total

Takeaway: *Level* of requirements $\Rightarrow$ aggregate cost. *Design* $\Rightarrow$ incidence.

Contribution

1. Macro-banking with heterogeneous transmission

Corbae and Erasmo (2021), Begenau (2020), Elenev, Landvoigt, and Van Nieuwerburgh (2021), Mendicino et al. (2020)

Model estimated on within-bank IRFs; validated on untargeted cross-sectional moment

2. Quasi-experimental credit supply

Aiyar, Calomiris, and Wieladek (2016), Gropp, Guettler, and Saadi (2020), De Jonghe, Dewachter, and Ongena (2020), Jimenez et al. (2017), Conti, Nobili, and Signoretti (2023)

Same shock traced across sectors and buffer distribution $\Rightarrow$ structural cost mapping

3. Deposit franchise and regulatory incidence

Drechsler, Savov, and Schnabl (2017)

Deposit franchise shapes not only monetary transmission but also incidence of capital regulation

Methodology: global neural-network solution (L. Maliar, S. Maliar, and Winant, 2021)

Roadmap

1. **Data & Stylized Facts** — balance-sheet heterogeneity, funding capacity
2. **Empirical Strategy** — identified shocks, local projections
3. **Empirical Results** — sectoral asymmetry, buffer gradient
4. **Stylized Model** — qualitative mechanics
5. **Quantitative Model** — dynamic framework, neural-network solution
6. **Estimation & Results** — SMM, fit, gross cost, counterfactuals
7. **Discussion & Conclusion**

Data

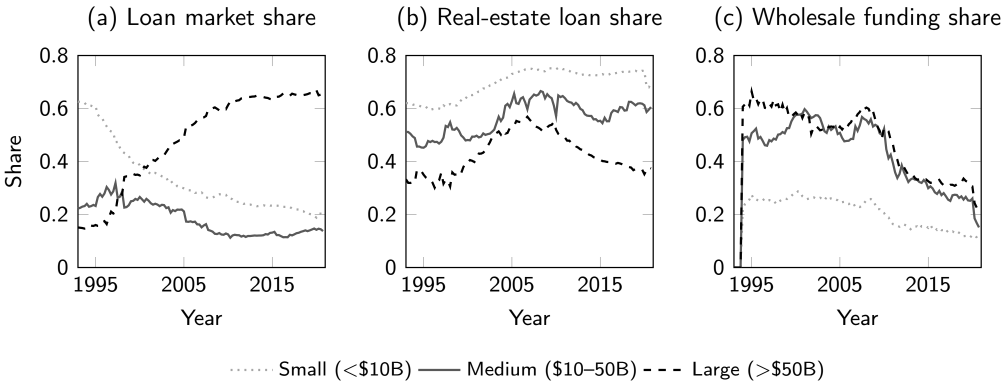
Source: Consolidated Reports of Condition and Income (Call Reports, FDIC)

- $\sim$4,800 U.S. commercial banks, quarterly, 1994–2019
- Loans decomposed: real estate, C&I, consumption, credit card
- Macro controls: real GDP growth, federal funds rate (FRED)

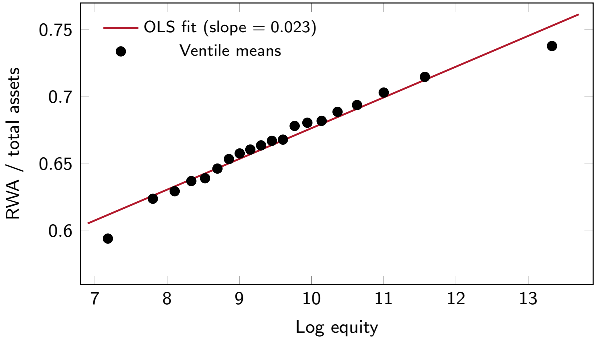
Size cohorts (Dodd-Frank/EGRRCPA thresholds):

Cohort	Assets	Regulatory regime
Small (Community)	$<$ \$10B	Baseline κ
Medium (Regional)	\$10B–\$50B	$\kappa + 1.5$pp (DFA)
Large (SIFI)	$>$ \$50B	$\kappa + 2.5$pp (G-SIB)

Market Concentration and Asset Specialisation

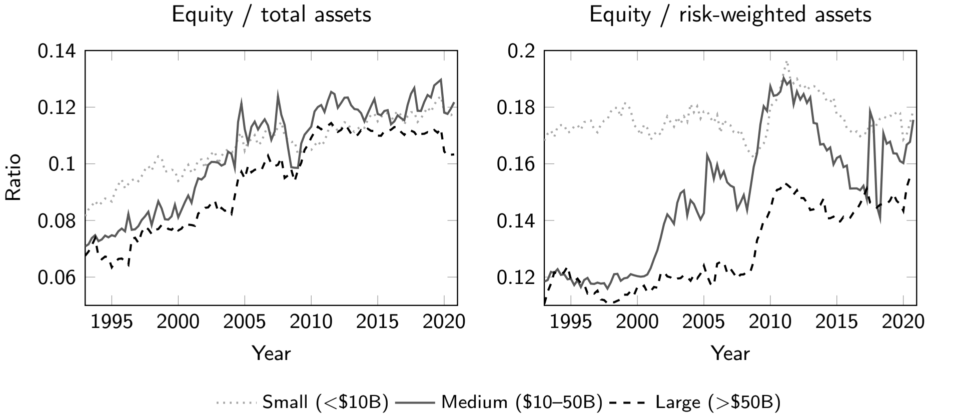


The Regulatory Wedge



RWA/total-assets ratio rises with bank equity ⇒ larger banks hold higher average risk weights; portfolio composition drives the regulatory position of small banks.

Leverage vs. Regulatory Capital Ratios



Small banks appear more capitalised on an unweighted basis, but the advantage compresses under risk-weighting. The regulatory ratio is more volatile ⇒ risk-weight mechanism amplifies shocks.

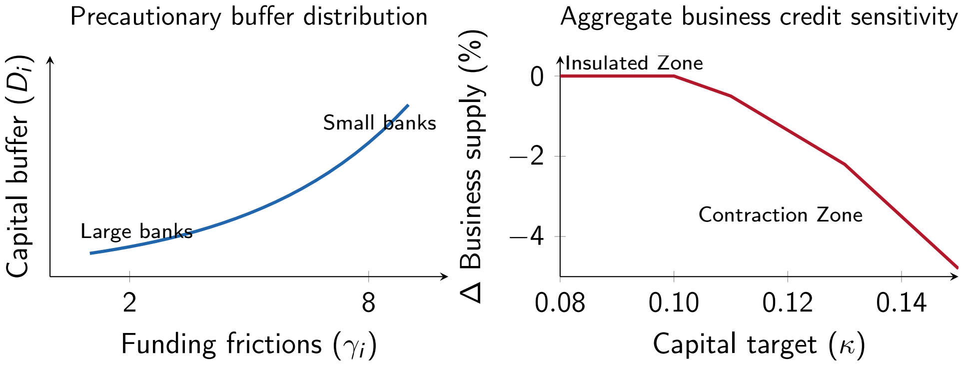
Funding Capacity and Regulatory Slack

Funding Capacity $\equiv$ (core retail + NIB deposits) / total liabilities
Regulatory Slack $D_{it} \equiv r_{it} - \kappa_t$ (distance to constraint, pp)

Dep. var: Slack (pp)	(1) Pooled	(2) Between	(3) Within
Funding Capacity	-19.44^{***}	-25.97^{***}	-2.27^{**}
	(1.73)	(1.95)	(1.05)
Log Assets	-2.80^{***}	-2.70^{***}	-6.27^{***}
	(0.09)	(0.10)	(0.16)
Quarter FE / Bank FE	Yes / No	—	Yes / Yes
N	935,234	16,117	935,056

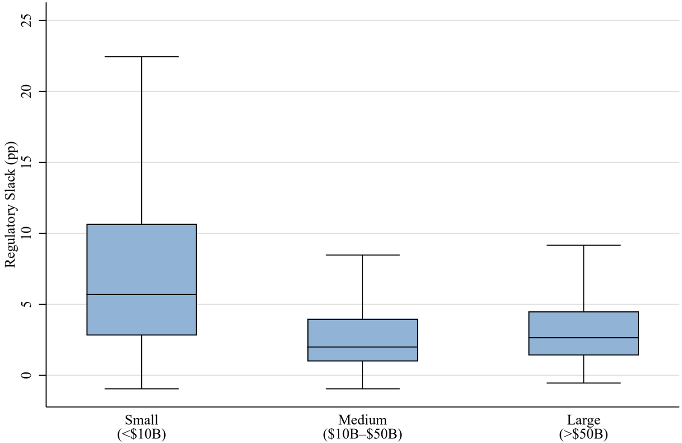
Banks with stable deposit franchises hold *thinner* buffers; those exposed to wholesale funding *self-insure* with larger precautionary cushions. The buffer is an equilibrium object shaped by the bank's structural funding model.

The Insulated Zone



When shocks are small-to-moderate, well-buffered banks absorb them internally. Only shocks large enough to breach the buffer trigger non-linear credit contractions.

Buffer Heterogeneity Cuts Across Size Tiers



Source: US Call Reports, 1993Q2–2019Q4.
Regulatory slack: equity-to-RWA ratio minus effective requirement (κ_{eff}), winsorized at 1/99.

Small banks span the full range of buffer positions; medium and large institutions cluster near the frontier but still vary. Statutory size is a poor proxy for regulatory tightness $\Rightarrow$ condition on the buffer distribution directly.

Identification: Capital-Requirement Shocks

Shock series: Drechsel and Miura (2025)

- Narrative + sign-restriction approach
- Captures unanticipated changes in the capital-requirement stance
- Available 2002Q1–2023Q2; estimation sample capped at 2019Q4

Properties of the identified innovations:

- Serially uncorrelated at quarterly frequency (autocorrelation -0.47, mean ≈ 0)
- The innovations are *surprises*; the near-unit-root persistence is a property of the requirement *level* they cumulate into
- Post-crisis regulation = sequence of regime changes, not transitory shocks

Local Projection Specification

$$x_{t+h} - x_{t-1} = \alpha_h + \beta_h \, \text{shock}_t^{\text{Cap}} + \sum_{p=1}^{6} \Psi_{h,p} \, x_{t-p} + \varepsilon_{t+h}$$

where $x_t = [I_t^{RE}, \ I_t^{CI}, \ e_t, \ g_t, \ i_t]'$

- **Aggregate:** OLS, Newey–West standard errors (lag $h + 6$)
- **Bank-level:** bank FE, winsorised at 1st/99th, clustered by bank
- Both sectors enter every equation $\Rightarrow$ responses conditioned on each other
- Six lags of controls (AIC)

Identification Checks

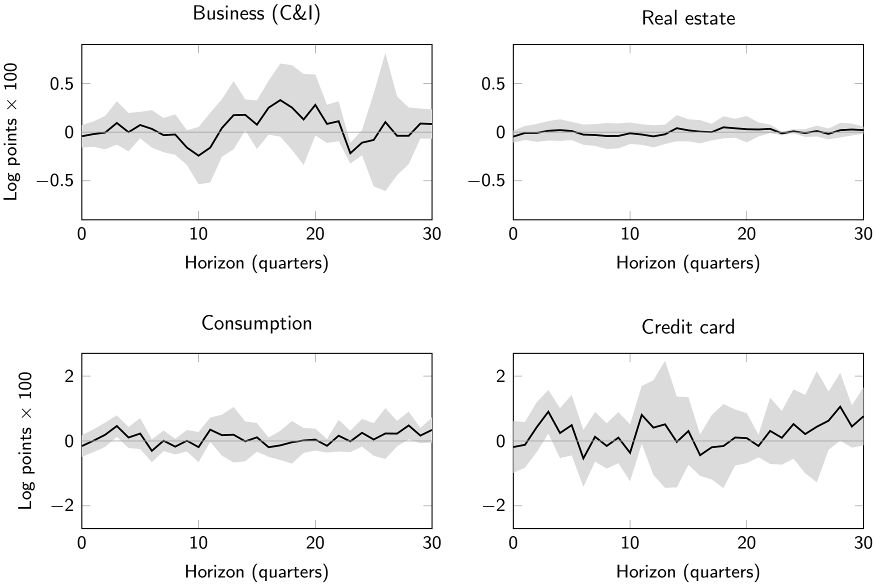
Three checks support the identification:

1. Pre-trend placebo: re-estimating at $h \in \{-4, \ldots, -1\}$ yields $|t| < 1.5$ throughout—lending does not anticipate the innovations.

2. Serial uncorrelatedness: the shock series is serially uncorrelated, consistent with its construction as surprises.

3. Consumer credit placebo: consumption and credit-card lending—fully risk-weighted but funded against high interest margins—show no response at any horizon $\Rightarrow$ transmission operates through the regulatory valuation of the balance sheet, not aggregate demand.

Fact 1: Sectoral Asymmetry in Credit Responses



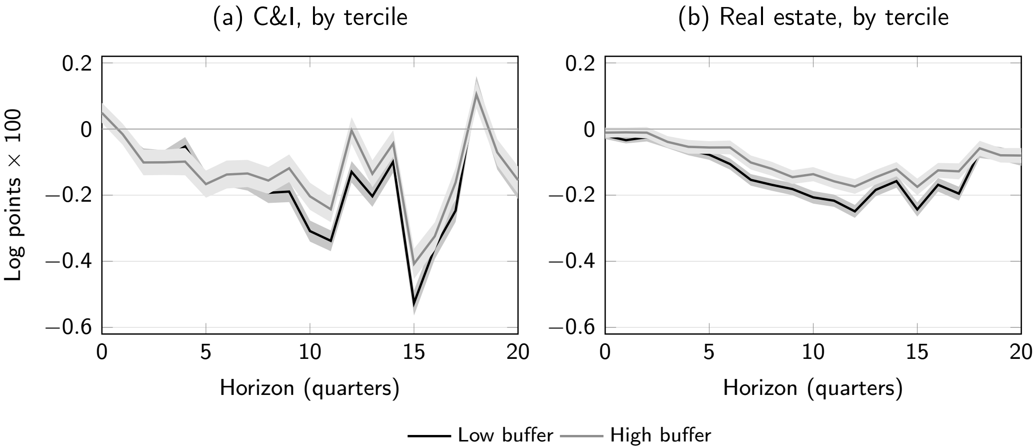
Interpreting the Sectoral Asymmetry

Why C&I contracts more than RE:

- **Asset Substitution Margin:** when the constraint binds, banks shed high-ω assets (C&I, $\omega_B = 1$) to free the most required capital per dollar cut
- **Scale Deleveraging Multiplier:** $\partial \text{RWA}/\partial A^B = \omega_B > \omega_M = \partial \text{RWA}/\partial A^M$
Each dollar of C&I cut yields twice the regulatory relief of a mortgage cut
- **Consumer credit unresponsive:** high interest margins provide sufficient cash-flow buffers to absorb the regulatory cost without volume rationing

Result: the sectoral composition of the contraction is determined by the risk-weight schedule, not by loan demand.

Fact 2: The Buffer Gradient

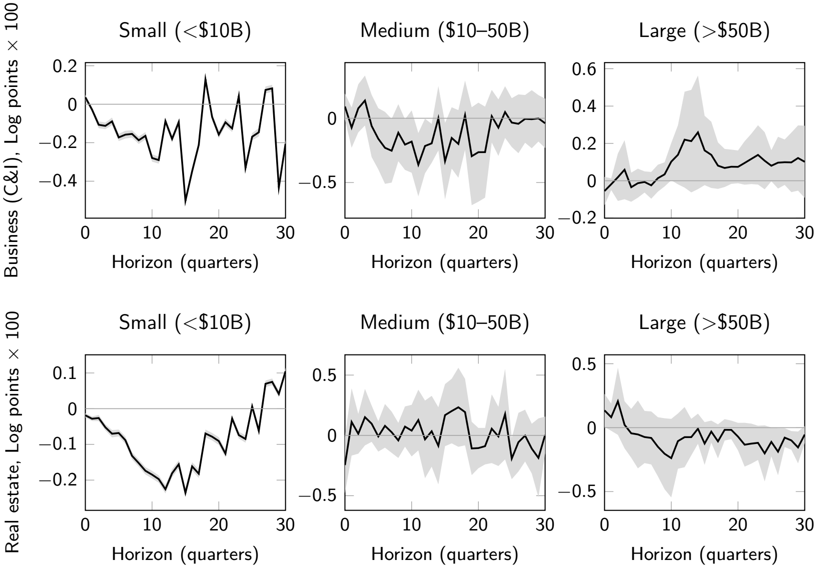


Banks sorted by lagged regulatory slack $D_{i,t-1}$. Low-buffer banks contract 1.29× more (C&I). The model reproduces the gradient (1.23×, **untargeted**).

The Buffer Gradient: Details

- Sort banks each quarter into **within-quarter terciles** of lagged regulatory slack $D_{i,t-1}$
- Low-to-high C&I response ratio: 1.29 in data, 1.23 in the model (*untargeted*)
- Gradient reflects *current* regulatory state, not a permanent bank type: freezing terciles at pre-sample (1994–2001) averages $\Rightarrow$ gradient *disappears*
- C&I contracts more than RE *within every tercile*
- Statistical power concentrated among community and regional banks; large-bank cohort ($\sim$40 institutions) too small for precise estimates

Size Cohort Impulse Responses



Summary of Empirical Facts

Fact	**Finding**
1. Sectoral asymmetry	C&I contracts $\sim$40% more than RE within banks (risk-weight wedge)
2. Buffer gradient	Thin-buffer banks cut 1.29$\times$ more; gradient vanishes with frozen terciles
3. Placebo	Consumer credit unresponsive at all horizons
4. Robustness	Results stable to 2023Q2 extension, pandemic controls

Next: a model that rationalises both facts with one mechanism.

Stylized Model: Environment

Static, partial equilibrium. Continuum of risk-neutral banks $i \in [0,1]$.

- Two asset classes: mortgages (A_i^M, $\omega_M = 0.50$) and C&I (A_i^B, $\omega_B = 1.00$)
- Liabilities: core deposits $d_{i,C} \leq \bar{d}_{i,C}$ (cheap, capped) + wholesale $d_{i,W}$ (quadratic friction $\frac{\gamma_i}{2} d_{i,W}^2$)
- $\gamma_{\text{small}} \gg \gamma_{\text{large}} \to 0$: small banks face steep wholesale costs
- Regulatory constraint: $e_i \geq \kappa(\omega_M A_i^M + \omega_B A_i^B)$

Capital buffer:

$$D_i = e_i - \kappa(\omega_M A_i^M + \omega_B A_i^B) \geq 0$$

Banks with high $\gamma_i \Rightarrow$ large endogenous D_i (self-insurance).

First-Order Conditions and the Sectoral Channel

FOC for asset class $j \in \{M, B\}$:

$$r_j - r_W - \psi_j A_i^j - \gamma_i(A_i^M + A_i^B - e_i - d_{i,C}) = \lambda_i \kappa \omega_j$$

When $\lambda_i > 0$ (constraint binds):

- **Asset Substitution Margin:** $\left|\partial A_i^B / \partial \kappa\right| > \left|\partial A_i^M / \partial \kappa\right|$ because $\omega_B > \omega_M$
- **Scale Deleveraging Multiplier:** $\partial \mathrm{RWA} / \partial A^B = \omega_B = 1 > 0.5 = \omega_M \Rightarrow$ cutting C&I frees $2\times$ the regulatory capital per dollar

Cross-section: for low-γ banks, λ_i stays low $\Rightarrow$ small response. For high-γ banks whose buffer is breached, λ_i spikes $\Rightarrow$ acute, non-linear contraction in C&I.

Quantitative Model: Overview

Dynamic, partial equilibrium, heterogeneous-agent.

- Continuum of infinitely lived banks; equity state $e_{i,t}$
- Two sectors (RE, C&I) with inverse loan demand $r_{j,t} = \theta_j - \eta_j L_t^j$
- Market clearing: equilibrium rate solved analytically $r_{j,t}^* = \theta_j - \eta_j \cdot \frac{1}{N} \sum_i \hat{A}_{i,t}^j$
- Idiosyncratic credit-depreciation shocks $\varepsilon_{i,t}^j$
- Single aggregate disturbance: κ_t follows an AR(1)
- Occasionally binding regulatory constraint + dividend non-negativity
- Entry/exit: failed banks ($e_{i,t} < 0$) replaced by entrants funded via insurance levy τ_t

The Dynamic Bank Problem

$$V(e_{i,t}, A^M_{i,t-1}, A^B_{i,t-1}; \Omega_t) = \max \mathbb{E}_t \sum_{\tau=0}^{\infty} \beta^\tau c_{i,t+\tau}$$

Equity law of motion:

$$e_{i,t+1} = (1-\delta_e)e_{i,t} + \sum_j \left[(r_{j,t} - \varepsilon^j_{i,t+1})A^j_{i,t} - \frac{\psi_j}{2}(A^j_{i,t})^2 \right]$$
$$- r_{d,t}\bar{d}_{i,C} - r_{W,t}d^W_{i,t} - \frac{\gamma_i}{2}(d^W_{i,t})^2 - c_{i,t} - \tau_t e_{i,t}$$

Subject to:

$$\omega_M A^M_{i,t} + \omega_B A^B_{i,t} \leq \frac{e_{i,t}}{\kappa_{i,t}}, \qquad c_{i,t} \geq 0$$

Euler Equations

Optimal credit allocation (sector j):

$$\beta\,\mathbb{E}_t\left[(1+\mu_{i,t+1})\left(r_{j,t}-\varepsilon^j_{i,t+1}-\psi_j A^j_{i,t}-r_{W,t}-\gamma_i d^W_{i,t}\right)\right]=\lambda_{i,t}\,\omega_j$$

Shadow value of equity:

$$1+\mu_{i,t}=\frac{\lambda_{i,t}}{\kappa_{i,t}}-\tau_t+(1-\delta_e+r_{W,t}+\gamma_i d^W_{i,t})\cdot\beta\,\mathbb{E}_t[(1+\mu_{i,t+1})]$$

Complementarity:

$\lambda_{i,t}\geq 0$, capital constraint ≥ 0, $\lambda_{i,t}\times$ slack $=0$
$\mu_{i,t}\geq 0$, $c_{i,t}\geq 0$, $\mu_{i,t}\,c_{i,t}=0$

Neural-Network Solution

Challenge: occasionally binding constraints $\Rightarrow$ kinked policy functions; standard perturbation fails.

Approach: parameterise policy with a multi-layer perceptron (MLP):

$$\begin{bmatrix} \hat{A}^M_{i,t} \\ \hat{A}^B_{i,t} \\ \hat{c}_{i,t} \\ \hat{\lambda}_{i,t} \\ \hat{\mu}_{i,t} \end{bmatrix} = \mathcal{A}(S_{i,t};\, \Theta) \qquad S_{i,t} \equiv (e_{i,t}, A^M_{i,t-1}, A^B_{i,t-1}, \Omega_t)$$

- **Structural loss:** squared Euler residuals (both sectors + equity) + soft KT penalty
- **Market clearing:** imposed analytically via closed-form equilibrium rate
- **Optimizer:** AdamW with cosine annealing
- **Architecture:** 4 hidden layers $\times$ 256 nodes, Swish activation
- Distribution μ_t compressed to moments + kernel-density mass near \$10B/\$50B thresholds

Calibration

Parameter	Description	Value	Source
β	Discount factor	0.99	Standard
δ_e	Equity depreciation	0.001	Stationarity
ω_M, ω_B	Risk weights	0.50, 1.00	Basel III
κ_{base}	PCA minimum	10%	Regulatory
$\bar{\kappa}_{\text{DFA}}$	DFA add-on	1.5%	Enhanced prudential
$\bar{\kappa}_{\text{SIFI}}$	SIFI add-on	2.5%	G-SIB surcharge
γ_{small}	Wholesale friction	0.077	Funding structure
ψ_M	RE adjustment cost	0.007	RE share target
ψ_B	C&I adjustment cost	0.05	Preset
η_M, η_B	Demand slopes	external	Lit. semi-elasticities
$\sigma_{\varepsilon,M}$	Idiosync. shock (RE)	0.001	Charge-off data
$\sigma_{\varepsilon,B}$	Idiosync. shock (C&I)	0.004	Charge-off data

SMM Estimation Strategy

Estimate: $\theta = (\rho_\kappa, \sigma_\kappa)$ — persistence and volatility of the capital-requirement process

Targets: 16 within-bank LP coefficients
C&I and RE responses at $\mathcal{H} = \{1, 2, 4, 6, 8, 12, 16, 20\}$

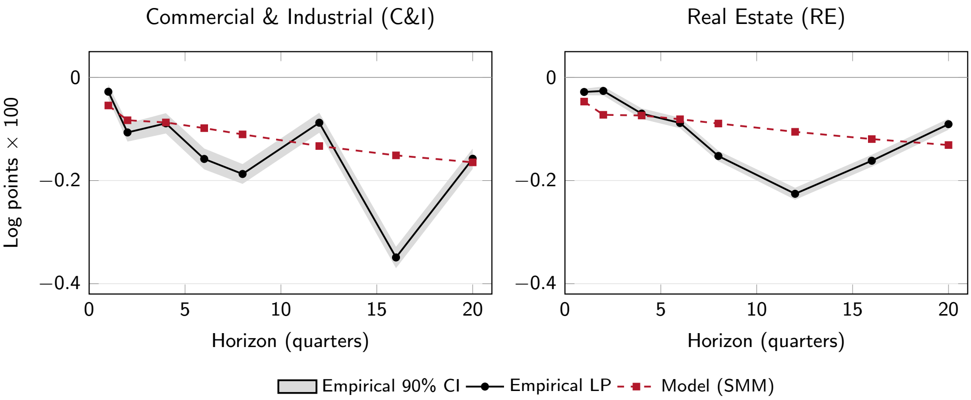
Weighting: $\mathsf{W} = \hat{\Sigma}^{-1}$, block-diagonal, estimated by cluster bootstrap of the bank-level LPs (100 replications)

Intuition for identification:

- $\rho_\kappa \leftarrow$ decay rate of the IRF at medium horizons
- $\sigma_\kappa \leftarrow$ amplitude of the impact response

For each candidate θ: re-solve the neural-network model, simulate a panel impulse path, compute model-implied LP coefficients.

Estimation: Model vs. Data



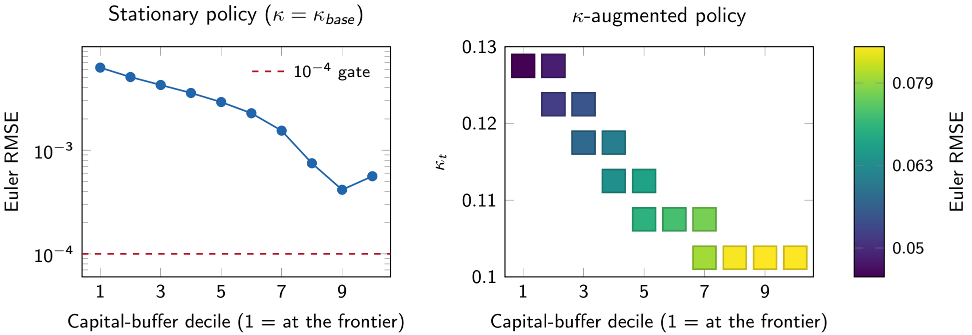
$\hat{\rho}_\kappa = 0.9987$ (s.e. 0.004), $\hat{\sigma}_\kappa = 0.00040$ (s.e. 0.00002). Interior estimate, within 1 s.e. of a unit root. Consistent with post-crisis regulation as permanent regime changes.

SMM Moment Fit

Sector	Horizon h	$\hat{b}_h$ (data)	s.e.	b_h (model)	t
C&I	1	-0.028	0.008	-0.054	+3.20
	2	-0.107	0.011	-0.083	-2.20
	4	-0.089	0.012	-0.087	-0.14
	6	-0.158	0.012	-0.098	-4.85
	8	-0.187	0.012	-0.110	-6.57
	12	-0.088	0.012	-0.133	+3.84
	16	-0.349	0.013	-0.151	-15.73
	20	-0.158	0.012	-0.165	+0.58
RE	1	-0.028	0.004	-0.047	+4.87
	2	-0.026	0.005	-0.073	+8.80
	4	-0.070	0.006	-0.074	+0.59
	6	-0.088	0.006	-0.081	-1.15
	8	-0.152	0.006	-0.089	-10.29
	12	-0.226	0.007	-0.106	-17.02
	16	-0.162	0.007	-0.120	-5.97
	20	-0.091	0.007	-0.131	+6.16

Hansen $J = 1822.15$, $\mathrm{dof} = 14$, $\chi^2_{0.05} = 23.68$, $p = 0.000$

Solution Accuracy



All deciles below 10^{-2}. The frontier spike reflects the kink in policy functions at the occasionally binding constraint—the hardest region for the neural-network approximation.

Gross Cost: Framework

Consumption-equivalent variation (CEV):

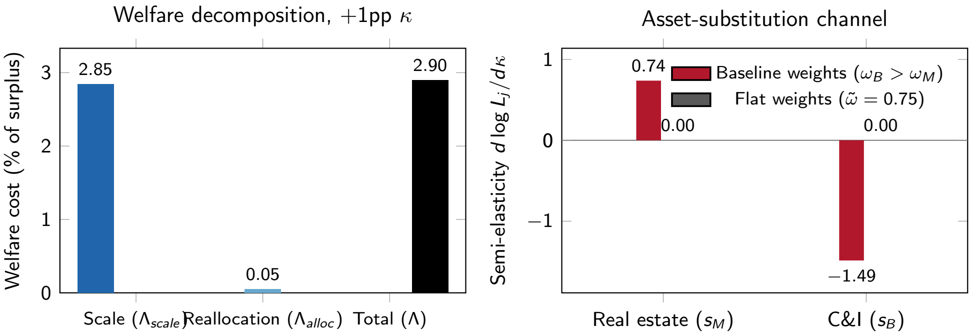
$$V^{\kappa}(\mu^*;\, \kappa^* + 0.01) = V^*((1-\Lambda)\,\mu^*;\, \kappa^*)$$

$\Lambda > 0 =$ fraction of steady-state surplus households would forgo to avoid the tightening.

Decomposition:

$$\Lambda = \underbrace{\Lambda^{\text{alloc}}}_{\text{sectoral distortion}} + \underbrace{\Lambda^{\text{scale}}}_{\text{credit contraction}}$$

- Two metrics: credit-market surplus and franchise value (discounted dividends)
- **Caveat:** gross cost—no stability benefits, partial equilibrium



Left: CEV decomposition—scale channel dominates. Right: constrained-regime semi-elasticities. RE substitution effect disappears under flattened weights.

Gross Cost: Numbers

Experiment	Quantity	Value
CEV of $+1$pp κ tightening (eq. 37–38)		
Total welfare cost	Λ	2.898%
scale channel	Λ_{scale}	2.846%
allocation channel	Λ_{alloc}	0.054%
additivity check	$\Lambda_{scale} + \Lambda_{alloc}$	2.900%
Credit contraction (total / RE / C&I)	ΔL	-3.09% / -3.02% / -3.50%
CEV from the franchise value V (discounted dividends)		
Total welfare cost	Λ_V	2.404%
scale channel	$\Lambda_{V,scale}$	2.392%
allocation channel	$\Lambda_{V,alloc}$	0.026%
additivity check	sum	2.419%
CF1: uniform vs. size-differentiated κ (eq. 39)		
Differentiated rule	Λ	2.682%
Uniform $\tilde{\kappa} = 0.1246$	Λ	2.680%
CF2: flat risk weights $\tilde{\omega} = 0.75$ (eq. 40)		
Baseline sectoral asymmetry	$s_B - s_M$	-2.224
Flat-weight sectoral asymmetry	$s_B - s_M$	-0.000

Credit-market surplus: $\Lambda = 2.9\%$. Franchise value: $\Lambda_V = 2.4\%$. Scale channel accounts for $>98\%$ of the cost.

Policy Counterfactuals

CF1: Uniform vs. size-differentiated κ

- Replace the step function with a uniform $\tilde{\kappa} = 0.1246$ raising the same aggregate capital
- Gross cost: 2.680% vs. 2.682% $\Rightarrow$ size-tailoring redistributes but barely reduces the aggregate burden

CF2: Risk-weight flattening

- Set $\tilde{\omega}_B = \tilde{\omega}_M = 0.75$ (average), hold κ fixed
- Sectoral asymmetry $s_B - s_M$ collapses from -2.22 to 0.00
- Aggregate credit contraction essentially unchanged

Level of requirements $\Rightarrow$ aggregate cost.
Design (risk weights, size tiers) $\Rightarrow$ incidence.

Magnitudes in Context

Study	Design / setting	Effect of +1pp required capital
Aiyar, Calomiris, and Wieladek (2016)	UK bank-level requirement changes, 1998–2007	Lending growth 6.5–7.2pp lower
Mésonnier and Monk (2015)	EBA 2011–12 capital exercise, euro area	Annualised loan growth 1.2–1.6pp lower
De Jonghe, Dewachter, and Ongena (2020)	Pillar-2 decisions, Belgian credit register, 2013–15	Corporate credit growth $\approx$ 0.2–0.4pp per quarter lower
Conti, Nobili, and Signoretti (2023)	Narrative BVAR, Italy (EBA/CA episodes)	Loan supply -1.5% after 2 years per $+40$bp Tier 1 ($\approx -3.8\%$ per pp, linearised)
This paper (model)	SMM-estimated policy, permanent $+1$pp κ	C&I -3.5%, RE -3.0%, total credit -3.1% (stationary comparison)
This paper (LPs)	Within-bank LPs scaled through the SMM mapping (one shock unit $\mapsto \hat{\sigma}_\kappa = 4.0$bp of κ)	Trough responses $\approx -8.8\%$ (C&I, h=16) and $\approx -5.7\%$ (RE, h=12); out-of-sample linear extrapolation

Model's -3.5% C&I / -3.0% RE / -3.1% total per $+1$pp sits squarely inside the quasi-experimental range.

Policy Lessons

1. **Aggregate cost is a scale phenomenon**
   $\Lambda^{\text{scale}} \approx 2.8\%$ vs. $\Lambda^{\text{alloc}} \approx 0.05\%$
   Architecture debates are about *incidence*, not aggregate cost

2. **The buffer distribution identifies who adjusts**
   Distance to the frontier $\succ$ statutory size categories
   Supervisory attention should track the buffer distribution
   Consistent with "do not cross" behaviour (Couaillier et al., 2025)

3. **Historical resilience $\neq$ structural immunity**
   Buffers are a finite resource
   Non-linear contractions under unprecedented shocks
   Buffer *releases* in downturns most potent near the frontier

Caveats and Future Work

What this paper does not do:

- No stability benefits of capital $\Rightarrow \Lambda$ is a **gross** cost
- Partial equilibrium: no feedback to factor prices or aggregate demand
- Risk-neutral bank owners ($\Lambda = 1$)
- No aggregate TFP shock

How would general equilibrium channels affect the results?

- Borrower substitution to non-bank intermediaries (shadow banks, bond markets) $\Rightarrow$ attenuates real-side impact
- Equilibrium loan-rate adjustment $\Rightarrow$ direction ambiguous
- Aggregate-demand feedback $\Rightarrow$ could amplify via investment

PE estimates isolate the pure supply mechanism $\Rightarrow$ transparent upper bound on banking-sector adjustment cost.

Next steps:

- General equilibrium with a priced default channel
- Weigh the transition costs against the stability benefits

Conclusion

Who bears the burden of bank capital regulation?

- **Sectors:** risk weights concentrate the contraction in C&I lending (40% more than RE)
- **Banks:** the distance to the regulatory frontier, not size, determines who adjusts ($1.29\times$ gradient, replicated at $1.23\times$ untargeted)
- **Cost:** $+1$pp tightening costs 2.4–2.9% of credit-market surplus
- **Design:** risk weights and size tiers redistribute the burden but barely change its aggregate magnitude

These are **gross transition costs** excluding the stability benefits of capital.

Thank you

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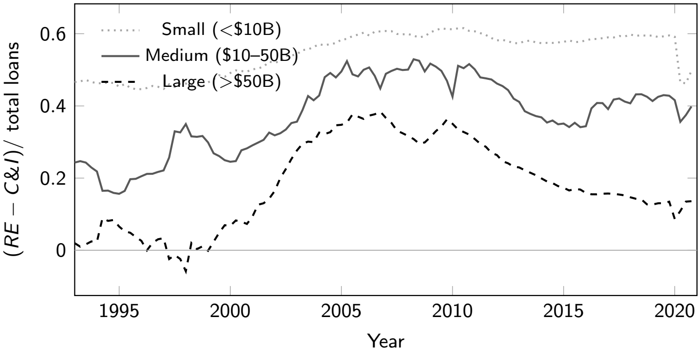
Latest version of the paper

Backup: Asset Gap



Difference between RE and C&I lending as a share of total loans, by size cohort, 1993–2020.

Backup: Robustness to Sample Extension

Re-estimating small-cohort LPs on the full shock series (2002Q1–2023Q2):

Treatment	Mean C&I response	Mean RE response
Baseline (2002–2019)	-0.145%	-0.105%
Pandemic dummy $\times$ shock	-0.142%	-0.106%
Exclude pandemic shocks	-0.142%	-0.106%

Target moments are essentially unchanged.

Backup: Sensitivity to ψ_B

Constrained-regime sectoral asymmetry $s_B - s_M$ across the admissible range of $\psi_B \in (0.014, 0.142)$:

ψ_B	$s_B - s_M$
0.02	-3.5
0.05 (baseline)	-2.2
0.10	-0.8
Flat weights (any ψ_B)	0.0

The asymmetry is a risk-weight phenomenon; ψ_B governs only its amplitude.

References I

Aiyar, Shekhar, Charles W Calomiris, and Tomasz Wieladek (2016). “How does credit supply respond to monetary policy and bank minimum capital requirements?” In: *European Economic Review* 82, pp. 142–165.

Begenau, Juliane (2020). “Capital requirements, risk choice, and liquidity provision in a business-cycle model”. In: *Journal of Financial Economics* 136.2, pp. 355–378.

Conti, Antonio M, Andrea Nobili, and Federico M Signoretti (2023). “Bank capital requirement shocks: A narrative perspective”. In: *European Economic Review* 151, p. 104254.

Corbae, Dean and Pablo D Erasmo (2021). “Capital Buffers in a Quantitative Model of Banking Industry Dynamics”. In: *Econometrica* 89.6, pp. 2975–3023. doi: 10.3982/ecta16930.

Couaillier, Cyril et al. (2025). “How to release capital requirements in an economic downturn? Evidence from euro area credit register”. In: *Journal of Financial Intermediation* 63, p. 101148.

References II

- De Jonghe, Olivier, Hans Dewachter, and Steven Ongena (2020). "Bank capital (requirements) and credit supply: Evidence from pillar 2 decisions". In: *Journal of Corporate Finance* 60, p. 101518.
- Drechsel, Thomas and Ko Miura (2025). "The macroeconomic effects of bank regulation: New evidence from a high-frequency approach". In.
- Drechsler, Itamar, Alexi Savov, and Philipp Schnabl (2017). "The Deposits Channel of Monetary Policy". In: *Quarterly Journal of Economics* 132.4, pp. 1819–1876.
- Elenev, Vadim, Tim Landvoigt, and Stijn Van Nieuwerburgh (2021). "A macroeconomic model with financially constrained producers and intermediaries". In: *Econometrica* 89.3, pp. 1361–1418.
- Gropp, Reint, Andre Guettler, and Vahid Saadi (2020). "Public bank guarantees and allocative efficiency". In: *Journal of Monetary Economics* 116, pp. 53–69.

Jimenez, Gabriel et al. (Dec. 2017). "Macroprudential Policy, Countercyclical Bank Capital Buffers, and Credit Supply: Evidence from the Spanish Dynamic Provisioning Experiments". In: *Journal of Political Economy* 125.6, pp. 2126–2177. issn: 1537-534X. doi: 10.1086/694289. url: http://dx.doi.org/10.1086/694289.

Maliar, Lilia, Serguei Maliar, and Pablo Winant (2021). "Deep learning for solving dynamic economic models.". In: *Journal of Monetary Economics* 122, pp. 76–101.

Mendicino, Caterina et al. (2020). "Bank capital in the short and in the long run". In: *Journal of Monetary Economics* 115, pp. 64–79.

Mésonnier, J-S and A Monk (2015). "Heightened bank capital requirements and bank credit in a crisis: the case of the 2011 EBA Capital Exercise in the euro area". In: *Rue de la Banque* 08.