

# DOES MONETARY TIGHTENING IMPROVE BANKING STABILITY? THE ROLE OF BANK COST EFFICIENCY

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# FINANCIAL INSTABILITY CAN STRIKE *anyone*

*“The 2007–2009 global financial crisis demonstrated that severe financial instability is not an historical curiosity or something that can happen only in emerging markets. It can happen in, and do terrible damage to, even the most advanced economies and the most sophisticated financial systems.”*

— Ben S. Bernanke, Chair of the Federal Reserve 2006–2014  
*21st Century Monetary Policy (2022)*

# CENTRAL BANKS ARE REFOCUSING ON FINANCIAL STABILITY

*“At the Federal Reserve, we have devoted substantially increased resources to monitoring financial stability and have refocused our regulatory and supervisory efforts to limit the build-up of systemic risk...”*

— Janet L. Yellen, Chair of the Federal Reserve 2014–2018

*Remarks at the IMF, 2014*

# THE TWIN OBJECTIVE

- Monetary policy and financial stability are **jointly determined**, even when institutional mandates treat them as separate objectives.
- A growing consensus recognises a **twin objective** — price stability *and* financial stability (Oosterloo, 2004; Yellen, 2014).
- Yet achieving both has **remained elusive** (Borio & Crockett, 2000; Borio, 2005) — reflecting tensions over how monetary decisions transmit through bank balance sheets, borrower risk, and the build-up of vulnerabilities.

## Our question

Does monetary **tightening** improve or weaken banking stability — and for *which* banks?

# MONETARY POLICY & BANKING STABILITY: A CONTESTED LINK

- **Easing:** accommodation can compress margins, soften lending standards, and fuel a **risk-taking channel** (Rajan, 2006; Jiménez et al., 2014; Maddaloni & Peydró, 2011).
  - ▶ Others argue regulatory/supervisory failures — not policy — drove the build-up (Bernanke, 2010; Svensson, 2010).

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  - ▶ Others argue regulatory/supervisory failures — not policy — drove the build-up (Bernanke, 2010; Svensson, 2010).
- **Tightening:** some find discipline and screening *improve* stability (Jiménez et al., 2014; Lamers et al., 2019).
  - ▶ Others find it *destabilising* via debt service, weaker cash flows, and credit losses (De Graeve et al., 2008; Altunbas et al., 2014).

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## Why this paper?

Evidence splits on sign, horizon, and bank heterogeneity. **Cost efficiency** — a proxy for monitoring, screening, and loss-mitigation capacity — has received **little direct attention** as the conditioning channel.

## WHY COST EFFICIENCY MATTERS FOR STABILITY

- Monetary tightening raises funding costs and borrower stress, but also strengthens screening and discipline.
- Banks differ in **operational technology**: monitoring, provisioning, and cost control.
- Efficiency links the monetary stance to risk management and loss absorption.

### Research Question

Does bank cost efficiency **moderate the full trajectory** of the banking-stability response to monetary tightening — shaping both the *level* (impact gain vs. medium-run reversal) and the *timing* of adjustment through faster, cheaper risk management?

## KEY TAKEAWAYS

1. Tightening can improve *or* weaken stability — **at different horizons**.
  - ▶ Impact gains fade as borrower distress accumulates.
2. The missing conditioning variable is **bank cost efficiency**.
  - ▶ More efficient banks absorb policy shocks more smoothly.
3. A DSGE block provides structural interpretation and rationalises the empirics.

### Bottom line

Efficiency is not micro “housekeeping”: it is a **macro-financial stabiliser** that interacts with the monetary stance.

## DATA & MEASUREMENT

- **Sample:** 3,903 banks from 95 countries, 1996–2024.
- **Cost efficiency (stochastic metafrontier):** total cost on loans, price of capital, price of borrowed funds (scaled by price of labour).
  - ▶ Environmental controls: country profitability, equity ratio; metafrontier-level GDP growth and inflation.
- **Monetary policy stance:** Taylor-rule deviations — hybrid and official.
- **Controls:** bank (size, asset structure, liquidity); country (concentration, growth, inflation, institutions).

# DATA SNAPSHOT

## Global sample means

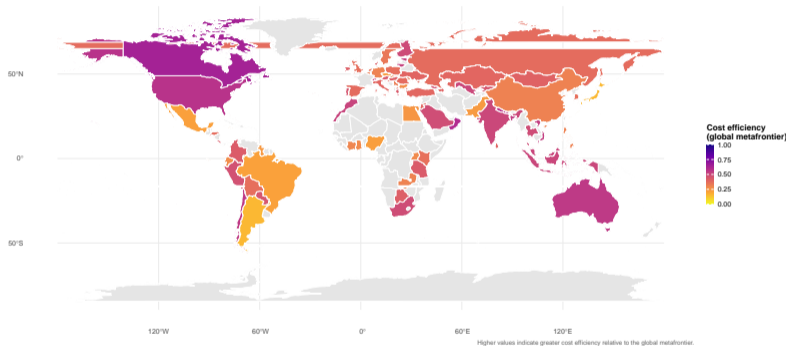
|                | Global |
|----------------|--------|
| Z-score        | 26.80  |
| $ce_{meta,gl}$ | 0.46   |
| NIM (%)        | 3.91   |
| NPL ratio (%)  | 4.47   |

- **Scale of the global panel:** mean Z-score  $\approx 27$  and efficiency  $\approx 0.46$  describe the typical bank.
- **Stability is high on average but not uniform:** cross-country dispersion in efficiency (see next) motivates treating it as a state variable.

# COST EFFICIENCY IS FAR FROM UNIFORM

## A. Global Metafrontier Cost Efficiency

Country averages of global metafrontier cost efficiency scores



- Cross-country dispersion motivates treating efficiency as a **state variable** that shapes transmission.

# EMPIRICAL STRATEGY: FIXED EFFECTS & LOCAL PROJECTIONS

## Baseline:

$$\text{ZScore}_{i,j,t} = \alpha_i + \mu_j + \delta_t + \alpha_1 \text{Policy}_{j,t-1}^z + \alpha_2 \text{CostEff}_{i,j,t} + \gamma \mathbf{X}_{i,j,t}^{\text{bank}} + \phi \mathbf{X}_{j,t}^{\text{country}} + \varepsilon_{i,j,t}$$

## Local Projections with interaction:

$$\text{ZScore}_{i,j,t+h} = \alpha_i + \mu_j + \delta_t + \beta_{1,h} \text{Policy}_{j,t-1}^z + \beta_{2,h} \text{CostEff}_{i,j,t} + \beta_{3,h} (\text{Policy}_{j,t-1}^z \times \text{CostEff}_{i,j,t}) + \dots$$

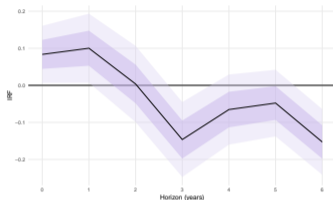
- IRF traced at the 25th, 50th, 75th percentiles of efficiency.
- IV robustness uses central bank independence as instrument.

## BASELINE FE: TIGHTENING RAISES STABILITY ON AVERAGE

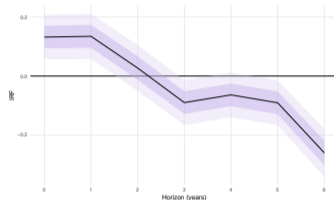
| Specification     | Hybrid policy |              | Official policy |              |
|-------------------|---------------|--------------|-----------------|--------------|
|                   | Contemp.      | Lagged ctrls | Contemp.        | Lagged ctrls |
| Baseline FE       | 0.139***      | 0.116***     | 0.174***        | 0.154***     |
| + Liquidity & LFX | 0.137***      | 0.106***     | 0.172***        | 0.144***     |
| + Liquidity & LTV | 0.124***      | 0.094***     | 0.161***        | 0.133***     |

- A tighter stance is associated with a **higher Z-score** across specifications.
- Effect survives macroprudential controls; cost efficiency itself enters positively.

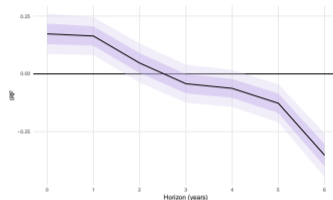
# DYNAMIC Z-SCORE IRFs: THE SIGN REVERSAL



P25 — low efficiency



P50 — median



P75 — high efficiency

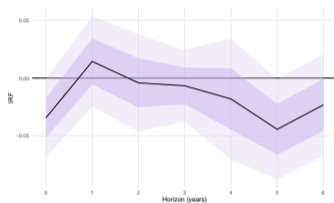
- **Impact ( $h = 0$ ):** Z-score rises across groups; strongest at P75.
- **Medium run ( $h = 3-5$ ):** response turns negative; P25 reverses **earliest and most sharply**, P75 shows the **smoothest path**.
- Efficiency shapes both the *level* and the **timing** of the response.

## CHANNEL I: TIGHTENING COMPRESSES MARGINS

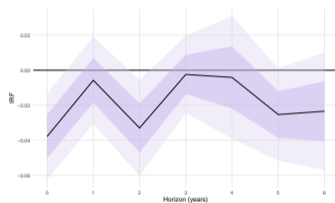
| Specification     | Hybrid policy |              | Official policy |              |
|-------------------|---------------|--------------|-----------------|--------------|
|                   | Contemp.      | Lagged ctrls | Contemp.        | Lagged ctrls |
| Baseline NIM      | -0.037***     | -0.034***    | -0.037***       | -0.036***    |
| + Liquidity & LFX | -0.044***     | -0.046***    | -0.044***       | -0.047***    |
| + Liquidity & LTV | -0.045***     | -0.045***    | -0.045***       | -0.047***    |

- NIM compression is robust across specifications and policy definitions.
- Margin squeeze helps explain why impact stability gains fade.

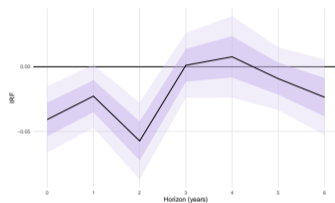
# CHANNEL I (CONT.): NIM IRFs BY EFFICIENCY



P25 — low efficiency



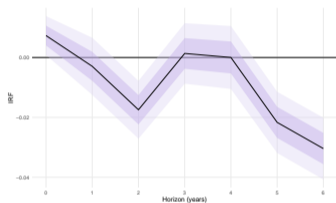
P50 — median



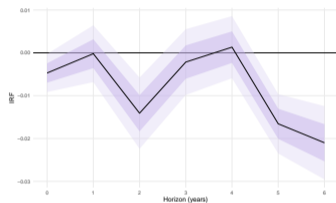
P75 — high efficiency

- Efficient banks see more persistent NIM compression (up to  $\approx 3$  years).
- Consistent with competitive discipline and prioritising asset quality over yield chasing.

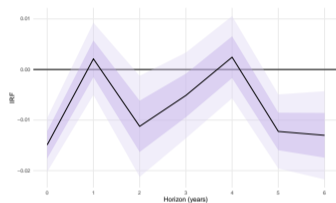
## CHANNEL II: CREDIT GROWTH IS HETEROGENEOUS



P25 — low efficiency



P50 — median



P75 — high efficiency

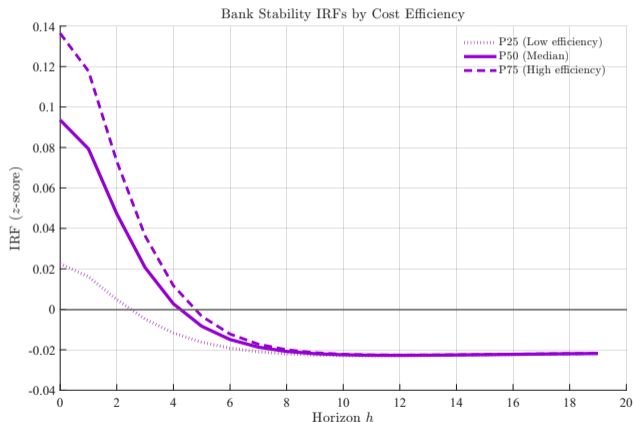
- On impact: credit growth  $\uparrow$  for less efficient;  $\downarrow$  for more efficient.
- Consistent with yield chasing (P25) vs. front-loaded balance-sheet discipline (P75).

## MECHANISM AND STRUCTURAL DISCIPLINE: DSGE BLOCK

- New Keynesian (NK) + banking block with efficiency-conditioned risk management.
- Tightening shocks:
  - ▶ **Fast channel:** risk-management effort increases on impact (stronger for high efficiency).
  - ▶ **Slow channel:** borrower distress rises persistently, raising default risk over time.
- This interaction reproduces: **impact stabilisation, sign reversal, and efficiency-conditioned smoothing.**

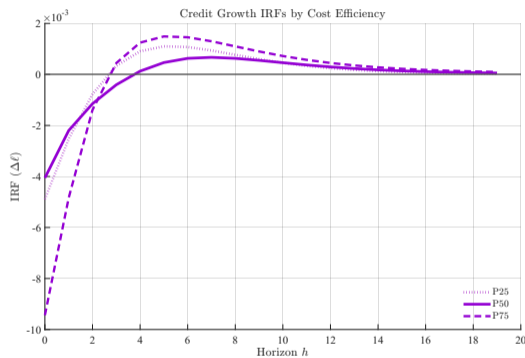
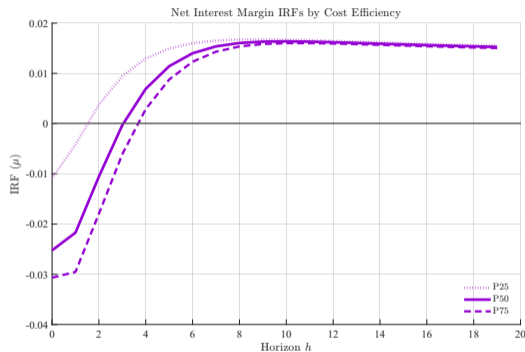
**Role of the DSGE:** rationalises the empirical IRFs and clarifies when “**stabilising tightening**” transitions into “**strain.**”

# DSGE 1: BANK STABILITY IRFs



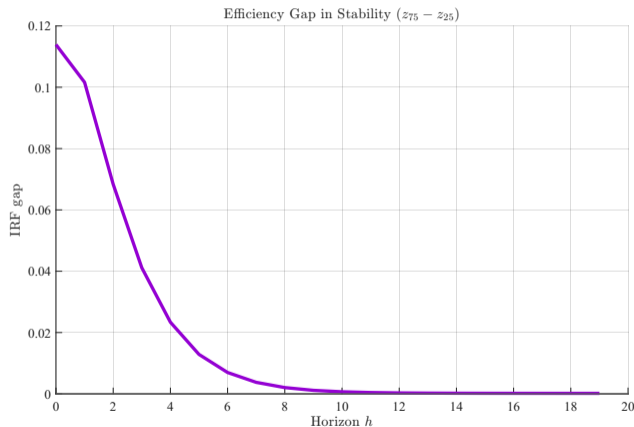
- Model mirrors the empirical ranking: **P75 improves most on impact.**
- All types experience later deterioration.
- P25 reverses earliest, matching the data.

# DSGE 2: NIM AND CREDIT GROWTH



- Reproduces **NIM compression on impact**.
- Credit-growth response is **heterogeneous**: strongest lending contraction at high efficiency.

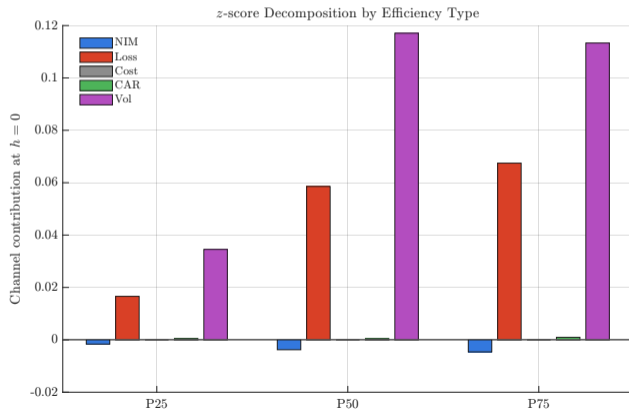
## DSGE 3: EFFICIENCY GAP $z_{75} - z_{25}$



- Gap widens on impact: efficient banks gain most from the fast monitoring channel.
- Closes over time as the slow distress channel affects all banks in parallel.
- Efficiency is a **front-loaded** stabiliser.

# DSGE 4: Z-SCORE DECOMPOSITION

$$\hat{z}_{k,t} = \underbrace{w_{\text{NIM}} \hat{\mu}_{k,t}}_{\text{(i) flow margin}} - \underbrace{w_{\text{loss}} \lambda_{\text{LGD}} \hat{p}_{k,t}}_{\text{(ii) credit-loss tail}} - \underbrace{w_{\text{cost}} c_{m,k} \hat{m}_{k,t}}_{\text{(iii) monitoring cost}} + \underbrace{w_{\text{CAR}} (\hat{e}_{k,t} - \hat{l}_{k,t})}_{\text{(iv) capital ratio}} + \underbrace{w_{\text{vol},k} \hat{m}_{k,t}}_{\text{(v) volatility reduction}}$$



- **Volatility reduction (v)** dominates on impact and scales with  $w_{\text{vol},k} v_k$ , explaining the P75 > P50 > P25 ordering.
- **Credit-loss tail (ii)** is the only medium-run drag large enough to flip the Z-score sign.

# COUNTERFACTUAL EXPERIMENTS

| Experiment (isolates $\rightarrow$ )  | $z_{25}(0)$ | $z_{50}(0)$ | $z_{75}(0)$ | $z_{75} - z_{25}$ |
|---|-------------|-------------|-------------|-------------------|
| (1) Baseline  | +0.011      | +0.043      | +0.103      | +0.092            |
| (2) No deposit market power $\beta_{D,k}=1 \rightarrow$ NIM / deposit-franchise channel     | +0.010      | +0.042      | +0.102      | +0.092            |
| (3) Homogeneous efficiency $\rightarrow$ role of cross-bank $\theta_k$ heterogeneity        | +0.048      | +0.048      | +0.048      | <b>0.000</b>      |
| (4) No risk-management $\nu_k=0 \rightarrow$ necessity of the fast monitoring channel       | -0.032      | -0.033      | -0.033      | -0.002            |
| (5) Higher capital requirement $\bar{\kappa}=0.15 \rightarrow$ capital-constraint tightness | +0.011      | +0.043      | +0.103      | +0.092            |

- (3) **Homogeneous efficiency** collapses the cross-bank gap to zero: heterogeneity in  $\theta_k$  is the story.
- (4) **Without risk-management**, impact stabilisation disappears entirely — monitoring is *necessary*, not incidental.
- (2), (5) deposit power and capital-requirement changes have only **modest near-term effects** on Z-score.

# POLICY IMPLICATIONS

## 1. Horizon & state dependence

Tightening is neither universally stabilising nor destabilising; the banking response is **state- and horizon-dependent**.

## 2. Supervision

Treat **cost efficiency as information about risk-control capacity**, not just operating performance.

## 3. Macroprudential design

Account for **efficiency heterogeneity**: banks with similar capital and liquidity can react very differently to the same shock.

## RELEVANCE FOR BANK OF GHANA

- Short-run banking responses to tightening may look reassuring — the paper warns these gains are **not permanent**.
- Monitoring should focus on **low-efficiency banks**, where medium-run reversals are sharper.
- A tightening episode is absorbed more safely when supervision strengthens:
  - ▶ governance and internal controls,
  - ▶ monitoring and provisioning technology,
  - ▶ timely repricing and risk-recognition capacity.
- **Broader lesson:** operational resilience and monetary transmission are linked.

# CONCLUSION

Tightening can improve stability over an intermediate range, but prolonged restrictiveness can **reverse the gains**.

## Policy message

Strengthening the **operational foundations of intermediation** makes monetary tightening safer from a financial-stability perspective.

Thank you.