Dynamic Competition for Sleepy Deposits

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Outline

Motivation: “Sleepy” retail deposits

Retail depositors rarely shop for better terms.

- Account turnover is low: new checking/savings accounts are roughly 8–15% of existing accounts per year (average life $\approx$ 8 years).
- Account closings are mostly idiosyncratic (e.g., inactivity, no longer needed, moving, death); only about 17% of closures cite switching for better rates/services/fees.
- Estimated share inactive each year is very high ($\approx$ 94%).

Why this matters

Sleepiness changes the industrial organization of deposit markets.

- Competition: does depositor inertia soften competition, or induce dynamic "invest vs. harvest" incentives that can also intensify competition for active depositors?
- Bank value: how much of the deposit franchise value is attributable to sleepy deposits?
- Financial stability: how does the deposit franchise buffer banks when rates rise?
- Policy relevance: regulators (e.g., UK FCA) have pushed for more pass-through of interest rates to depositors; what happens if deposit competition becomes effectively static?

This paper: core questions

- How sleepy are retail depositors, and how does sleepiness vary with rates and demographics?
- What does sleepiness imply for deposit market markups and their cyclicality?
- How does a dynamic view change the relationship between concentration and markups?
- How large is the deposit franchise value effect, and who benefits most?
- What happens under counterfactuals that eliminate sleepiness / dynamic competition?

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Data sources (and market definition)

- Account-level turnover microdata from a core account processing platform: 89 banks/credit unions, 12 million deposit accounts.
- FDIC Summary of Deposits (SoD), 1994–2023: branch deposits aggregated to bank×county×year.
- RateWatch (2001–June 2023): bank×county×year average rates by account type.
- Call Reports: bank-level cost shifters (salary expenses, premises/fixed-asset expenses).
- Final estimation panel: 341,395 bank×county×year observations, 2002–2023 (dropping single-bank markets).

Deposit rates and spreads

Paper's baseline rate measure uses **$10k money market deposit account** rates from RateWatch.

- Deposit spread defined as $\rho_{jkt} := R_t^F - r_{jkt}$ ("price" of deposit services).
- Summary stats (baseline sample):
  - Average deposit rate $\approx$ 34 bps.
  - Average spread $R_t^F - r_{jkt} \approx$ 97 bps.
  - Average market share per bank$\times$county observation $\approx$ 16%.

Stylized fact 1: low account openings (turnover)

- New checking/savings accounts are roughly 8–15% of existing accounts per year (life $\approx$ 8 years).
- Time deposits turn over faster (natural maturity).
- Cross-sectional patterns suggest frictions (search/switching/inattention), not just persistent tastes:
  - Higher turnover for business and large-balance accounts.
  - Lower turnover for age 65+.

Stylized fact 2: why accounts close

- Banks record closure reasons for about 75% of closures.
- Most common: *inactivity* (bank closes on customer's behalf).
- Moves and deaths account for >20% of closures.
- Only about 17% cite switching for better rates/services/fees.

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Model overview

Dynamic deposit market with **active vs. inactive** depositors.

- Each period depositors are either awake (active) or asleep (inactive).
- Active depositors choose a bank via discrete choice; inactive depositors keep last period's bank.
- Banks set deposit rates/spreads dynamically to maximize franchise value.
- Sleepiness generates **invest vs. harvest** incentives:
  - Harvest: inertia lowers elasticity $\Rightarrow$ lower offered rates (higher spreads).
  - Invest: capturing an active depositor today raises future deposits (if they become inactive).

Depositor utility and demand among active

Active depositor i choosing bank j in market k at time t:

$$u_{ijkt} = \alpha \rho_{jkt} + \delta_{jkt} + \varepsilon_{ijkt}, \qquad \rho_{jkt} := R_t^F - r_{jkt}, \quad \alpha < 0.$$

With Type-I extreme value ε_{ijkt}, active market share:

$$s_{jkt}^{Active} = \frac{\exp(\alpha \rho_{jkt} + \delta_{jkt})}{\sum_{\ell \in J_k} \exp(\alpha \rho_{\ell kt} + \delta_{\ell kt})}.$$

Sleepiness (inactivity) process

Depositor activity depends on observables and an idiosyncratic shock:

$$D_{it}^{*} = S_{k(i)t}'\Gamma + X_{it}'\Theta + \eta_{it}, \qquad D_{it} = 1(D_{it}^{*} > 0).$$

Market-level inactivity share:

$$\phi_{kt} = 1 - \mathbb{E}[D_{it} \mid S_{kt}].$$

Interpretation: reduced-form inattention / switching frictions; empirically ϕ_{kt} varies with rates and demographics.

Total deposits: active + inactive components

Total deposits held by bank j in market k at time t:

$$Dep_{jkt} = (1 - \phi_{kt}) M_{kt} s_{jkt}^{Active} \; + \; \phi_{kt}(1 + r_{jk,t-1}) Dep_{jk,t-1}.$$

- Active flow: $(1 - \phi_{kt}) M_{kt} s_{jkt}^{Active}$.
- Inactive stock: last period deposits roll over and earn interest.

Banks: flow profits and franchise value

Banks invest deposits at bank-level return R_{jt} and pay deposit rate r_{jkt} and marginal servicing cost c_{jkt}.

$$\pi_{jt} = \sum_{k \in K} Dep_{jkt} \Big((R_{jt} - R_t^F) + \rho_{jkt} - c_{jkt} \Big), \quad \rho_{jkt} = R_t^F - r_{jkt}.$$

Franchise value:

$$V_{jt} = \mathbb{E}\Big[\sum_{s=t}^{\infty} \beta^{s-t} \pi_{js} \Big].$$

Equilibrium: stationary Markov perfect equilibrium in pure strategies (BBL approach).

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Estimation: three steps

1. **Sleepiness** ϕ_{kt}: combine account openings/turnover microdata and deposit autocorrelation in SoD using a control function.
2. **Demand** (active depositors): compute active market shares using ϕ_{kt}, estimate (α, δ_{jkt}) via Berry (1994).
3. **Costs / supply** (dynamic game): estimate reduced-form spread policy functions; recover cost parameters via BBL (Bajari et al. 2007) using the condition that observed policies maximize franchise value.

Step 1: identifying sleepiness from account openings

Under the model, new accounts identify active demand:

$$NewDep_{\ell jt} = (1 - \phi(\cdot))M_{\ell t}s_{jt}^{Active}(1 - s_{j,t-1}).$$

Rearrangement yields a moment linking turnover to sleepiness:

$$1 - \frac{Dep_{\ell j,t-1}}{Dep_{\ell jt}} \frac{NewDep_{\ell jt}}{1 - s_{j,t-1}} = \phi(\cdot) + e_{\ell jt}.$$

Key finding: $\approx 94\%$ of depositors are inactive each year; sleepiness falls when the lagged fed funds rate is higher (people "wake up" when returns to shopping rise).

Step 1: autocorrelation and control function

Autocorrelation in deposits confounds sleepiness with persistent quality.

- Control function: regress spreads on cost shifters (salaries, fixed expenses) to recover latent demand:

$$\rho_{jkt} = \lambda Z_{jt} + v_{jkt}.$$

- Second stage: regress deposits on lagged deposits and the control:

$$Dep_{jkt} = (\Upsilon_1' S_{kt} + \Upsilon_2' X_{kt})(1 + R^F_{t-1} - \rho_{jk,t-1}) Dep_{jk,t-1} + H(v_{jkt}) + \iota_{jkt}.$$

Step 2: demand among active depositors

- Use estimated ϕ_{kt} to compute each bank's *active* market share s_{jkt}^{Active}.
- Estimate price sensitivity α and qualities δ_{jkt} using Berry (1994).
- Result: accounting for sleepiness makes deposit demand substantially more elastic (about 33–34% higher elasticity relative to treating all depositors as active).

Step 3: dynamic supply and costs (BBL)

- Parameterize (net) marginal costs:

$$c_{jkt} = \omega + \zeta R_t^F + \gamma' Z_{jt} + \chi_{jkt}.$$

- Flexibly estimate policy function mapping states to spreads (first-order polynomial in states + competitor sums).
- Use BBL (Bajari et al. 2007): forward-simulate franchise values under the observed policy and many deviations; pick cost parameters that rationalize observed policy as optimal.

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Result 1: sleepiness raises average markups

Counterfactual: eliminate sleepiness (all depositors always active) $\Rightarrow$ static competition.

- Average markups would be **53% lower** without sleepiness:
  - From about **68 bps** (baseline) to about **32 bps** (no sleepiness).

Result 2: sleepiness makes markups procyclical

- With sleepiness, markups rise more when the short rate rises (invest-versus-harvest incentives vary over the cycle).
- Quantitatively:
  - At the zero lower bound: average markup $\approx$ 31 bps.
  - In 2023 (short rates $>$ 5%): average markup $\approx$ 127 bps.

Result 3: concentration–markup relationship changes in the dynamic model

- In static/reduced-form views, markups often appear increasing in concentration (HHI).
- Accounting for dynamic competition:
  - Eliminates the increasing relationship between concentration and markups that obtains under static competition.
  - Markups can be high even in low-HHI areas because banks endogenously harvest sleepy bases.

Result 4: sleepiness explains a large share of deposit franchise value

- Under the static counterfactual (no sleepiness), average deposit franchise value falls by about **58%**.
- Interpretation: sleepiness accounts for more than half of the value of the average bank's deposit franchise.

Result 5: heterogeneity—who benefits most from sleepiness?

Sleepiness dependence is larger for banks with low quality or high costs.

- Moving from 25th to 75th percentile of product quality reduces sleepiness dependence by about 10.4 pp (62% $\rightarrow$ 51.6%).
- Moving from 25th to 75th percentile of marginal costs increases sleepiness dependence by about 3.4 pp (54.9% $\rightarrow$ 58.3%).

Result 6: financial stability implications

- Convert franchise value losses into risk-neutral default probabilities (using CDS-based approach in the paper).
- For the three largest deposit-taking banks (JPM, BofA, Wells Fargo):
  - Default probabilities rise by about 10 pp in normal times.
  - Increase by **more than 20 pp** during the 2022–2023 tightening cycle absent sleepy deposits.

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Policy counterfactual: making deposit competition static

Motivation: FCA and other regulators seek more pass-through to depositors (higher deposit betas).

- Paper's static counterfactual is a limiting case: constrain betas to unity $\Rightarrow$ banks compete on constant spreads rather than time-varying ones.
- Mechanism: eliminates dynamic invest-versus-harvest tradeoff induced by depositor sleepiness.
- Quantitative effects (from earlier results): lower markups, lower franchise value, higher fragility.

Extension 1: price discrimination via bonuses

Allow banks to offer different terms to new vs incumbent depositors.

- Helps discriminate between active (new) and inactive (incumbent) depositors, but imperfectly.
- Estimated customer acquisition costs are large:
  - Roughly **15 cents** to attract an additional **dollar** of deposits from new depositors.
- Main conclusions about sleepiness and dynamic competition remain similar.

Extension 2: forward-looking depositors

Re-estimate demand when active depositors are forward-looking.

- Adds an additional product characteristic: discounted expected utility of remaining asleep with today's choice.
- Demand becomes more elastic relative to myopic baseline.
- Qualitative conclusions about sleepiness/markups/franchise value remain similar.

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Conclusion

- Retail depositors are extremely inactive; most switching is not active shopping.
- A dynamic model with sleepiness rationalizes invest-versus-harvest incentives.
- Sleepiness substantially raises average markups and makes them procyclical.
- Dynamic competition changes the mapping from concentration to markups.
- Sleepiness explains a large share of deposit franchise value and matters for stability.

Appendix

Appendix A: extra figures (placeholders)