Depositor Inertia and Deposit Market Power

Yu Yi*
Nankai University

Changchuan Zhang†
City University of Hong Kong

Shengxing Zhang‡
Carnegie Mellon University, Tepper School of Business

Ying Zhou§
City University of Hong Kong

Abstract

Deposit rates adjust sluggishly to changes in market interest rates. We ask how *local deposit-market competition* interacts with *depositor inertia* to shape deposit market power and the passthrough of benchmark rates into deposit rates. We develop a model of deposit-market oligopoly with endogenous relationship formation in which depositor inertia (a relationship survival probability) and local competition (an effective number of competitors) jointly determine deposit spreads and deposit betas. The model predicts that consolidation lowers offered deposit rates and reduces passthrough, with larger effects when the depositor base is more captive. We test these predictions using posted retail deposit rates from RateWatch, merger completion and balance-sheet measures from Call Reports, and complaint-based proxies for depositor attention. In our sample, average deposit betas are low. Merger completion increases core deposit and reduces offered deposit rates, and spread passthrough rises around merger completion—implying lower deposit betas—with spillovers to non-merging banks in the same regions. We then examine the impact of monetary policy shocks in our calibrated model and find that depositor sleepiness amplifies the monetary shocks through the rise in the effective market power of banks in the deposit market.

JEL codes: E52, G21, L11, D83.
Keywords: deposit beta; deposit market power; depositor inertia; search frictions; bank mergers; local competition; monetary policy transmission.

*ivan_yyi@nankai.edu.cn
†cczhang28-c@my.cityu.edu.hk
‡shengxiz@andrew.cmu.edu
§ying.zhou@cityu.edu.hk

1 Introduction

Deposit interest rates respond sluggishly to changes in benchmark market rates. This rigidity is commonly summarized by the *deposit beta*, the passthrough from a benchmark opportunity cost of funds (e.g., the federal funds rate or Treasury yields) into banks' offered deposit rates. The central question of this paper is why deposit betas differ systematically across banks and over time and how would that impact the effectiveness of monetary policy. Our answer emphasizes the joint role of (i) *local deposit-market competition* and (ii) *depositor search and inertia*. Deposit betas are equilibrium objects: observed passthrough reflects both the competitive environment faced by a bank and the elasticity of deposit supply implied by depositors' propensity to search and switch.

We develop a model of deposit-market oligopoly with endogenous relationship formation. Each period, a fraction of depositors remain in existing relationships (captured by a relationship-survival probability λ), while the remaining depositors search and match with banks through a frictional matching technology. Banks post deposit rates and invest in recruiting effort. In this environment, banks trade off the extensive-margin benefit of attracting new depositors against the inframarginal cost of raising rates on their existing relationship base. The model yields sharp comparative statics that discipline the empirics: deposit betas are increasing in competition (a higher effective number of competitors M) and decreasing in depositor inertia (a higher λ). A reduction in competition—for example, a merger that reduces effective M—lowers offered deposit rates and lowers deposit betas, with larger effects when the depositor base is more captive. In our calibrated model, more captive depositor base also amplifies the monetary shocks through the rise in the effective market power of banks in the deposit market.

Empirically, we test these predictions using three data sources. We measure posted retail deposit rates from RateWatch; we proxy for depositor attention and search intensity using CFPB consumer complaints; and we measure core deposit, bank characteristics, and merger completion from Call Reports. Our empirical centerpiece uses mergers and acquisitions (M&A) as shocks to effective local competition. We examine both *levels* (rate repricing) and *passthrough* (deposit betas) around merger completion, and we further study spillovers to non-merging banks in the same regions. To connect the reduced-form patterns to the model's mechanism, we relate passthrough heterogeneity to customer-base "sleepiness" (core deposit and related measures) and to complaint-based proxies for depositor attention, and we interpret these relationships through the model's mapping from λ and M to deposit betas. In the event-study analysis, we use the interaction-weighted estimator of Sun and Abraham (2021) to accommodate staggered merger timing.

The evidence is consistent with the search-based mechanism. First, average deposit betas are low in our sample period: the unconditional spread passthrough estimates imply average deposit betas of roughly 0.23 for 12-month CDs, 0.05 for money market accounts, and 0.03 for savings accounts (Section 8). Second, merger completion is associated with discrete increases in core deposit (e.g., about 0.28 log points in Table 6) and with declines in offered deposit rates for CDs and money market accounts (Table 7). Third, spread passthrough rises around M&A completion (Figure 10 and Table 8), implying lower deposit betas after consolidation. Fourth, passthrough dynamics also shift for non-merging banks in regions experiencing M&A activity (Figure 6), consistent with local competitive conditions affecting

both rate levels and passthrough.

Roadmap. Section 2 positions the paper relative to work on deposit market power, depositor demand frictions, and competition measurement. Section 3 presents the model and derives comparative statics for deposit rates and deposit betas in M and λ. Section 4 characterizes the equilibrium. Section 5 calibrates the model and runs several comparative statics using the calibrated model. Section 6 proposes four testable implications that discipline the empirical work. Section 7 describes the data construction. Section 8 estimates deposit betas, studies merger-based competition shocks and regional spillovers, and relates passthrough heterogeneity to proxies for depositor attention and customer-base captivity.

2 Literature Review

This paper studies how *local deposit-market competition* and *depositor search frictions* jointly determine banks' deposit market power and, in turn, the *deposit beta* (deposit-rate passthrough to market rates). In our model, passthrough is an equilibrium outcome shaped by (i) the elasticity of deposit supply faced by a bank (which depends on depositor search and relationship inertia, summarized by λ) and (ii) the conduct implied by competition, summarized by an effective number of competitors M. Our empirical centerpiece exploits merger completion as a shock to effective local competition and studies both the direct effects on merging banks and spillovers to other banks in the same regions. The related literature falls into four overlapping strands: (1) deposit market power and monetary transmission; (2) local market structure, competition measurement, and competition shocks; (3) depositor demand frictions (search, switching costs, and limited attention) and their implications for deposit pricing; and (4) technologies and institutional changes that shift search frictions.

2.1 Deposit market power, deposit betas, and monetary transmission

A central theme in modern banking macro-finance is that market power in retail deposits shapes the transmission of monetary policy through banks. Drechsler et al. (2017) articulate a "deposits channel" in which banks with deposit market power adjust deposit spreads in response to policy-rate changes. In this view, deposit betas are low precisely because deposit supply is imperfectly elastic—banks can raise spreads when market rates rise without losing commensurate funding. The same logic links deposit market power to bank balance sheets and risk premia.

This deposits-channel perspective also informs how deposit franchise value affects banks' optimal maturity transformation. Drechsler et al. (2021) argue that a strong deposit franchise (manifested as low and interest-insensitive deposit rates) hedges interest-rate exposure and can rationalize maturity transformation even when asset cash flows are long-lived. In related work, Drechsler et al. (2018) connect nominal rates to liquidity premia, leverage incentives, and risk premia in intermediary asset pricing, highlighting that deposit-market conditions can matter for broader financial pricing.

Recent empirical work documents real and balance-sheet implications of deposit market power beyond short-run pricing. Li (2023a) shows that higher deposit market power is associated with more stable funding and a greater ability to supply long-term credit, consistent with the idea that a stable depositor base relaxes funding constraints. Complementary evidence links deposit market power to bank risk-taking and leverage (Li, 2023b), while Begenau and Stafford (2021) caution that reduced-form measures of deposit franchise strength and interest-rate exposure require careful interpretation. Together, these studies motivate our focus on *deposit betas* as a key equilibrium statistic that summarizes the strength of deposit market power and its implications.

Relative to this literature, our contribution is to provide a parsimonious micro-founded mechanism for heterogeneity in deposit betas across banks and over time. In our model, the deposit beta is pinned down by two economically interpretable objects: depositor inertia λ, which governs the size of the captive relationship base, and competition M, which governs the intensity of rate competition for marginal searchers. This discipline allows us to take the model to the data: we estimate passthrough using posted retail rates, map coefficients to deposit betas using the spread representation in Section 6, and use merger-based shifts in local competition to study the causal direction suggested by the theory.

2.2 Local deposit-market structure and competition measurement

A second strand concerns how to measure effective competition in banking markets. Standard structure-based proxies (e.g., concentration ratios, HHI) are informative but incomplete because concentration does not map one-to-one into conduct. Consequently, empirical work often augments structure measures with conduct-based indices such as the Lerner index, the Panzar–Rosse H-statistic, and the Boone indicator. Claessens and Laeven (2004) emphasize contestability and regulatory restrictions as drivers of effective competition, while Van Leuvensteijn et al. (2007) develops and applies the Boone indicator in banking. Policy summaries further discuss the interpretation and limitations of these measures (World Bank, 2016), and recent overviews highlight open questions at the intersection of deposit market power, digitization, and monetary policy (Carletti et al., 2024).

Our project takes local market structure seriously because retail deposits are raised in geographically and institutionally segmented markets. The model in Section 3 implies that local structure matters precisely because it shapes the residual elasticity of deposit supply, especially when depositor search is limited. Empirically, this motivates measuring a bank's exposure to local competition across the markets where it operates and relating that exposure to passthrough.

Beyond measurement, a growing empirical literature emphasizes that deposit-market competition has first-order implications for bank behavior and outcomes. Egan et al. (2017) study deposit competition and bank fragility, highlighting that shifts in depositor demand and competitive pressure can have implications for stability. Our focus differs: we study deposit-rate setting and deposit betas as the equilibrium objects through which competition and depositor frictions translate into deposit market power. Methodologically, our use of merger completion as a shock to effective local competition and our study of passthrough spillovers to non-merging banks provide an empirical check that the relevant competitive forces are local and that they operate through deposit pricing and rate responsiveness rather

than solely through compositional flows.

2.3 Depositor search, switching frictions, and deposit-rate dispersion

A core premise of the paper is that deposit betas are low because depositor demand is not perfectly elastic. A large IO literature shows that switching costs and limited attention can generate persistent price dispersion and "sticky" prices; in banking, Hannan (2008) provides evidence consistent with sizable consumer switching costs in deposit products. Information frictions and limited attention can further amplify these effects; Gabaix and Laibson (2006) show how firms may "shroud" prices/fees, a mechanism relevant for retail financial products where salient teaser rates coexist with complex or less salient terms.

Experimental and quasi-experimental evidence in retail savings markets similarly indicates limited switching even when information is improved. Adams et al. (2021) evaluate disclosure designs intended to facilitate comparison-shopping and find that switching remains limited, reinforcing the idea that search and inertia are first-order features of retail deposit markets. Modeling work also emphasizes product differentiation and heterogeneous consumer propensities to switch in shaping deposit-rate setting (Kiser, 2003). These studies align closely with our conceptual framework: banks with a larger "sleepy" depositor base face less elastic deposit supply and therefore choose lower deposit rates and lower passthrough.

This interpretation also connects to how researchers and practitioners value deposit franchises and the customer base embedded in banks. Calomiris and Nissim (2007) discuss valuation approaches incorporating core deposit intangibles, which motivates our empirical mapping between "sleepy" depositors and core deposit.

Our empirical implementation differs from much of this literature in two ways. First, we focus on passthrough (deposit betas) rather than only on level differences in deposit rates. Second, we bring in a behavioral proxy for depositor attention and search intensity using consumer complaints. We treat these measures as imperfect proxies for the relevant state variable (effective captivity) and interpret the results through the model's mapping from depositor search to deposit supply elasticity; we avoid a literal interpretation of complaints as causal determinants of pricing.

2.4 Technology, search costs, and the competitive environment in deposits

Digital technology can reduce search costs and expand the geographic scope of deposit markets, potentially raising deposit betas and compressing spreads. Erel et al. (2023) argue that online banking can alter monetary transmission by lowering search costs and broadening market reach. Related work shows that digital disruption (e.g., via improved connectivity) can reshape banks' competitive strategies, with some banks competing more aggressively on price and others relying on relationship-based deposit gathering (Jiang et al., 2024). Cross-sectional evidence links internet access to deposit-rate levels and dispersion (Kishan et al., 2021), consistent with the view that reduced search frictions increase depositor responsiveness.

These insights are directly relevant for our empirical strategy: we use behavioral proxies for depositor search/attention (and customer-base dynamics) to explain variation in deposit betas beyond what can be inferred from concentration alone.

In our setting, these mechanisms provide an interpretation for heterogeneity: reductions in search costs should lower effective captivity (lower λ) and thus raise deposit betas. While our core empirical competition design is merger-based, the search-cost channel clarifies why a given shift in local competition may have stronger effects for banks with sleepier depositor bases and why passthrough can vary substantially across products.

2.5 Competition, franchise value, and stability

Finally, our focus on deposit-market competition speaks to the competition–stability debate. The charter-value hypothesis posits that greater competition erodes franchise value and can increase risk-taking (Keeley, 1990); related theoretical work studies prudential regulation under liberalization and moral hazard (Hellmann et al., 2000). In contrast, Boyd and De Nicolò (2005) highlights mechanisms through which competition (especially in lending) can reduce borrower moral hazard and lower bank risk. The model in Section 3 clarifies why the deposit side is special: changes in depositor search frictions and local market structure shift deposit betas and funding costs, potentially affecting profitability, balance-sheet choices, and stability in ways that need not mirror loan-market competition.

2.6 Contribution and positioning

Relative to the existing literature, this project contributes in three ways. First, we provide a tractable model that links deposit betas to *two* sufficient statistics: depositor inertia λ and competition M, and it delivers sharp predictions for how mergers (a reduction in M) affect both deposit rates and deposit betas, including interaction effects when depositor captivity is high. Second, we bring these predictions to the data using posted deposit rates and a merger-based empirical design that traces both direct effects on merging banks and spillovers to other banks in the same regions. Third, we propose and implement empirical proxies for the underlying frictions—core deposit as a proxy for customer-base captivity and complaint-based measures as proxies for depositor attention—and we relate these proxies to passthrough heterogeneity in a way that is disciplined by the model's mapping from spreads to deposit betas.

3 Model

Consider a discrete-time, infinite-horizon economy populated by three sets of agents: a finite set of banks indexed by $i \in \{1, \ldots, M\}$, a continuum of firms, and a continuum of households. The economy features frictional formation of deposit relationships between households and banks. Time is indexed by $t = 0, 1, 2, \cdots$.

3.1 Households

There is a continuum of household families. Each family enters period t with financial wealth S_t, held as either deposits in banks or cash, and a vector of ongoing deposit relationships $\mathbf{H}_t = (H_{1t}, \ldots, H_{Mt})$, where H_{it} is the mass of family members in a deposit relationship with bank i at the end of period $t-1$.

The representative household family has preferences given by

$$V_t(\mathbf{H}_t, S_t) = \max_{C_t, S_{t+1}, \{h_{it}\}_{i=1}^M, N_t} \left[\ln(C_t) - \Psi \frac{N_t^{1+\phi}}{1+\phi} + \beta V_{t+1}(\mathbf{H}_{t+1}, S_{t+1}) \right], \tag{1}$$

where C_t is consumption, N_t is total labor supply, $\beta \in (0,1)$ is the discount factor, $\phi > 0$ is the inverse Frisch elasticity, and $\Psi > 0$ is a scaling parameter. Households face a budget constraint,

$$C_t + S_{t+1} \leq \left[\sum_{i=1}^M R_{it}^d H_{it} + R_t^0 \left(1 - \sum_{i=1}^M H_{it} \right) \right] S_t + W_t N_t + T_t, \tag{2}$$

where R_{it}^d denotes the gross deposit rate promised by bank i on existing relationships, R_t^0 is the gross convenience yield on cash (with $R_t^0 \leq \min_i\{R_{it}^d\}$ in equilibrium), W_t is the real wage, and T_t represents lump-sum transfers (including firm and bank profits, and any government transfers). The budget constraint shows that households earn returns on their savings: they receive R_{it}^d on deposits held in bank i relationships (with mass H_{it}) and R_t^0 on cash holdings (with mass $1 - \sum_{i=1}^M H_{it}$).

Timing. At the beginning of period t, the state $(\boldsymbol{H}_t, S_t)$ is given. Households receive returns on S_t according to their existing relationships and the cash outside option, choose (C_t, N_t, S_{t+1}), and allocate search effort $\{h_{it}\}_{i=1}^M$ across banks. Banks choose recruiting effort $\{b_{it}\}_{i=1}^M$ and post next-period promised deposit rates $\{R_{i,t+1}^d\}_{i=1}^M$. Matching occurs within period t and determines next period's relationship stocks $\boldsymbol{H}_{t+1}$ and the allocation of savings S_{t+1} across bank deposits and cash for period $t+1$.

Total labor supply splits between working for firms, N_t^f, and working as deposit officers for banks, N_t^d, so that $N_t = N_t^f + N_t^d$. The household can actively seek new deposit relationships. It chooses $h_{it} \geq 0$, the mass of members sent to seek a deposit contract with bank i. Matching is frictional. The mass of new matches with bank i is given by a constant-returns-to-scale matching function $m(h_{it}, b_{it})$, where b_{it} is the mass of deposit officers hired by bank i. Defining the banking sector tightness as $\theta_{it} \equiv b_{it}/h_{it}$, the probability a household member seeking bank i forms a match is

$$e(\theta_{it}) \equiv \frac{m(h_{it}, b_{it})}{h_{it}} = m(1, \theta_{it}) \tag{3}$$

The matching probability $e(\theta_{it})$ is increasing in market tightness θ_{it}: when banks hire more deposit officers relative to searching households, the probability of forming a match rises. This captures the idea that banks' investment in relationship-building (through deposit officers) facilitates the formation of deposit relationships.

We define the *matching elasticity* $\varepsilon \in (0,1)$ as

$$\varepsilon \equiv \frac{\theta e'(\theta)}{e(\theta)},$$

and assume it is constant. This implies $e(\theta)-\theta e'(\theta) = (1-\varepsilon)e(\theta)$ and nests the Cobb–Douglas specification used in Section 8. Households optimally allocate search effort across banks. In equilibrium, the marginal value from searching bank i must equal the marginal value from searching any other bank $k \neq i$. This indifference condition ensures that households are indifferent at the margin between searching different banks. Formally, the value from searching bank i is

$$V^h_{it+1} = \beta e(\theta_{it}) \frac{\partial V_{t+1}(\boldsymbol{H}_{t+1}, S_{t+1})}{\partial H_{it+1}}, \tag{4}$$

where $e(\theta_{it})$ is the probability of forming a match with bank i, and $\frac{\partial V_{t+1}(\boldsymbol{H}_{t+1}, S_{t+1})}{\partial H_{it+1}}$ is the marginal value of an additional deposit relationship with bank i (characterized in Lemma 1). The indifference condition requires that this value equals the value from searching other banks:

$$V^h_{it+1} = V^h_{t+1}\left(\{h_{it}\}_{i=1}^M ; \{b_{kt}, R^d_{kt+1}\}_{k\neq i}\right), \tag{5}$$

where $V^h_{t+1}\left(\{h_{it}\}_{i=1}^M ; \{b_{kt}, R^d_{kt+1}\}_{k\neq i}\right)$ denotes the common value from searching any alternative bank, which depends on all banks' choices through the general equilibrium effects on the distribution of unmatched households.

Different from a standard competitive directed search model, $V^h_{t+1}\left(\{h_{it}\}_{i=1}^M ; \{b_{kt}, R^d_{kt+1}\}_{k\neq i}\right)$ is affected by banks' decisions. Households can observe all banks' decisions. Since there is a finite number of banks, a bank i's choices impact households' time allocations to search and match in all banks.

Existing deposit relationships survive with exogenous probability $\lambda \in (0,1)$. λ measures the depositor inertia—the probability that a depositor maintains her relationship with a bank from one period to the next without actively searching. Therefore, the law of motion for relationships with bank i is

At the beginning of period t, a mass λH_{it} of household members remain in their existing relationship with bank i (they are "sleepy" and do not search). The remaining mass $1 - \lambda\sum_{i=1}^M H_{it}$ is unmatched and allocates search effort across banks, with $\sum_{i=1}^M h_{it} = 1 - \lambda\sum_{i=1}^M H_{it}$.

$$H_{it+1} = \lambda H_{it} + e(\theta_{it})h_{it}. \tag{6}$$

This equation shows that the stock of deposit relationships evolves through two channels: (i) a fraction λ of existing relationships survive, and (ii) new relationships are formed through the matching process, with $e(\theta_{it})h_{it}$ representing the mass of successful matches. The total mass of household members is normalized to one, imposing the aggregate adding-up constraint:

$$\sum_{i=1}^M (h_{it} + \lambda H_{it}) = 1. \tag{7}$$

We do not model the government explicitly; we allow for lump-sum transfers T_t so that the aggregate resource constraints and asset-market clearing hold.

3.2 Firms

A continuum of identical, competitive firms produce a homogeneous good using a Cobb-Douglas technology with capital k_{t-1} and labor l_{t-1}, carried from period $t-1$. Output in period t is

$$y_t = A_t k_{t-1}^{\alpha} l_{t-1}^{1-\alpha}, \tag{8}$$

where A_t is total factor productivity and $\alpha \in (0,1)$.

Firms finance their wage bill and physical investment through one-period loans D_t taken from the banking sector at the gross loan rate R_t. The timing is as follows. In period t, the firm borrows D_{t+1}. It uses these funds to pay wages $W_t l_t$ and finance net investment $k_t - (1-\delta)k_{t-1}$, where $\delta \in [0,1]$ is the depreciation rate. This implies a financing constraint:

$$D_{t+1} \geq W_t l_t + \left[k_t - (1-\delta)k_{t-1}\right]. \tag{9}$$

After the firm repays its outstanding debt $R_t D_t$, production occurs at the beginning of next period using the chosen (k_t, l_t).

The firm maximizes the expected present value of dividends, discounting using the household's stochastic discount factor, $q_{0t} = \beta^t (C_0/C_t)$:

$$\max_{\{l_t, k_t, D_{t+1}\}} \sum_{t=0}^{\infty} q_{0t} \left\{ A_t k_{t-1}^{\alpha} l_{t-1}^{1-\alpha} - R_t D_t + D_{t+1} - W_t l_t - \left[k_t - (1-\delta)k_{t-1}\right] \right\}, \tag{10}$$

subject to the financing constraint (9).

3.3 Banks

Each bank i enters period t with a stock of deposit relationships H_{it}, each associated with a promised deposit rate R_{it}^d. To attract new deposits, the bank posts a deposit rate R_{it+1}^d for the next period and hires b_{it} deposit officers. Given the matching process with household searchers h_{it}, the bank attracts a mass $m(h_{it}, b_{it})$ of new depositors. Consequently, total deposits collected at the end of period t (for investment in $t+1$) are

$$D_{it+1} = \left[\lambda H_{it} + m(h_{it}, b_{it})\right] S_{t+1}. \tag{11}$$

The bank lends all its deposits on a competitive interbank market at the gross rate R_t. This interbank rate R_t represents the bank's opportunity cost of funds—the rate it could earn by lending deposits in the wholesale market rather than holding them as reserves.

The bank's per-period profit consists of the net interest margin on its existing deposit stock, minus wage costs for deposit officers. Its value function $J_{it}(H_{it}, R_{it}^d)$ satisfies the Bellman equation

$$J_{it}(H_{it}, R_{it}^d) = \max_{b_{it}, R_{it+1}^d} \left[(R_t - R_{it}^d) H_{it} S_t - W_t b_{it} + \beta \frac{C_t}{C_{t+1}} J_{it+1}(H_{it+1}, R_{it+1}^d) \right], \tag{12}$$

subject to households' indifference condition (5) and the law of motion for its deposit relationship (6).

4 Equilibrium Characterization

In this section, we first characterize and define the symmetric equilibrium. We then show how the fraction of sleepy depositors affects the optimal deposit rate.

Households

Our model introduces search frictions to the deposit market. Households optimally allocate search effort $\{h_{it}\}_{i=1}^{M}$ and form deposit relationships with banks to maximize expected value, given the posted deposit rates $\{R_{it+1}^{d}\}_{i=1}^{M}$ and banks' investments in deposit officers $\{b_{it}\}_{i=1}^{M}$. Lemma 1 first characterizes the marginal value from maintaining a relationship with bank i at the beginning of period t.

Lemma 1 *The marginal value to the household of an additional deposit relationship with bank i at time t is given by*

$$\frac{\partial V_t(\boldsymbol{H}_t, S_t)}{\partial H_{it}} = \frac{S_t}{C_t}\left(R_{it}^{d} - R_t^{0}\right) + \sum_{s=1}^{\infty}(\beta\lambda)^s \,\Pi_{\tau=1}^{s}\left[1 - e(\theta_{it+\tau-1})\right]\frac{S_{t+s}}{C_{t+s}}\left(R_{it+s}^{d} - R_{t+s}^{0}\right) \tag{13}$$

Lemma 1 implies that, by establishing a relationship with bank i, a household earns an immediate net financial return $\left(R_{it}^{d} - R_t^{0}\right) S_t$, which yields marginal utility $\frac{S_t}{C_t}\left(R_{it}^{d} - R_t^{0}\right)$. Critically, the relationship has persistent value. With probability λ, it survives to the next period. The forward-looking component captures the continuation value of a relationship. In future period $t+s$, the relationship delivers the spread $R_{i,t+s}^{d} - R_{t+s}^{0}$ only if it survives up to that date (probability λ^s) and if, absent this relationship, the household would still be unmatched and thus forced into the cash outside option. The product $\Pi_{\tau=1}^{s}\left[1 - e(\theta_{i,t+\tau-1})\right]$ summarizes the probability of not forming a new match over the relevant horizon, so higher matching probabilities $e(\theta)$ reduce the option value of an incumbent relationship.

Lemma 2 characterizes the equilibrium distribution of unmatched households across banks.

Lemma 2 *In symmetric equilibrium, $h_{it} = h_t = \frac{1-\lambda M H_t}{M}$, $\forall i$. The responsiveness of distribution h_t to banks' choices on the equilibrium path is*

$$\frac{\partial h_t}{\partial b_t} = \frac{M-1}{M\theta_t} \tag{14}$$

$$\frac{\partial h_t}{\partial R_{t+1}^{d}} = \frac{(1-\lambda M H_t)(M-1)}{\varepsilon M^2} \times \frac{\frac{S_{t+1}}{C_{t+1}}}{\frac{\partial V_{t+1}(\boldsymbol{H}_{t+1}, S_{t+1})}{\partial H_{t+1}}} \tag{15}$$

Lemma 2 delivers three key implications. First, a bank attracts more unmatched households by hiring additional deposit officers ($\partial h_t / \partial b_t > 0$), albeit with diminishing returns in more concentrated deposit markets. The positive effect arises because more deposit officers increase the matching probability $e(\theta_t)$, making the bank more attractive to searching households.

Second, higher deposit rates raise a bank's market share ($\partial h_t/\partial R^d_{t+1} > 0$), a response moderated by the stock of existing deposit relationships H_t, depositor inertia λ, and deposit-market competition M. Equation (15) makes this transparent. The responsiveness is proportional to (i) the mass of unmatched households ($1-\lambda M H_t$), which shrinks as more depositors are locked into relationships; (ii) the degree of market competition through $(M-1)/M^2$; and (iii) the wedge between the marginal utility gain from a higher promised rate and the full shadow value of an additional relationship. The term $\frac{S_{t+1}/C_{t+1}}{\partial V_{t+1}/\partial H_{t+1}}$ is small when the relationship has substantial option value (because $\partial V_{t+1}/\partial H_{t+1}$ includes both the contemporaneous spread benefit and the continuation value from avoiding future mismatch risk). Third, symmetry in equilibrium ensures an equal distribution of unmatched households across all banks.

Firms

Let $\kappa_t \geq 0$ denote the Lagrange multiplier on the financing constraint in period t, which represents the marginal value of relaxing the firm's borrowing limit. Equations (16), (17), and (18) summarize firms' optimal production and financing plans.

$$l_t : \beta \frac{C_t}{C_{t+1}} (1-\alpha) A_{t+1} k_t^{\alpha} l_t^{-\alpha} = W_t (1+\kappa_t) \tag{16}$$

$$k_t : \beta \frac{C_t}{C_{t+1}} \left[\alpha A_{t+1} k_t^{\alpha-1} l_t^{1-\alpha} + (1-\delta)(1+\kappa_{t+1})\right] = 1+\kappa_t \tag{17}$$

$$D_{t+1} : 1+\kappa_t = \beta \frac{C_t}{C_{t+1}} R_{t+1} \tag{18}$$

Equation (16) implies that firms hire labor until the expected discounted marginal revenue product of labor equals the effective marginal cost of labor. The effective cost is the wage W_t multiplied by $1+\kappa_t$. The term κ_t acts as a financing wedge when the borrowing constraint binds. Similarly, Equation (17) represents that the expected discounted benefit of investing in one more unit of capital at time t equals the effective marginal cost of investment today, which includes the direct resource cost (1) and the shadow cost of financing it (κ_t). Equation (18) states that the marginal benefit of taking on an additional unit of debt today, $1+\kappa_t$, must equal the expected discounted cost of repaying that debt tomorrow $\beta \frac{C_t}{C_{t+1}} R_{t+1}$.

Banks

In symmetric equilibrium, all banks are identical. Each bank optimizes the deposit rate R^d_{t+1} and the quantity of deposit officers b_t, internalizing households' search responses. Lemma 3 summarizes how the bank value reacts to the depositor base and deposit rate.

Lemma 3 *Let $J_t(H_t, R^d_t)$ denote the bank's value in symmetric equilibrium. Its responsiveness with respect to the depositor base H_t and the deposit rate R^d_t are*

$$\frac{\partial J_t\left(H_t, R^d_t\right)}{\partial H_t} = \sum_{s=0}^{\infty} (\beta\lambda)^s \frac{C_t}{C_{t+s}} \left(R_{t+s} - R^d_{t+s}\right) S_{t+s} \tag{19}$$

$$\frac{\partial J_t\left(H_t, R_t^d\right)}{\partial R_t^d} = -H_t S_t \tag{20}$$

The lemma delivers two insights. First, Equation (19) shows that the marginal value of a depositor relationship equals the present discounted value of future net interest margins. As long as the relationship survives with probability λ each period, the bank earns the deposit spread $(R_{t+s} - R_{t+s}^d)$ per unit of savings S_{t+s}. For any given value of depositor relationship, greater depositor inertia allows banks to charge lower deposit spreads because they face less competitive pressure. Second, Equation (20) reveals that raising the deposit rate on existing contracts directly and linearly reduces bank value by eroding the profit margin on the entire existing deposit base. Lemma 4 then characterizes banks' optimal decisions.

Lemma 4 *Banks' optimal choices for the deposit rate R_{t+1}^d and deposit officer hiring b_t satisfy:*

$$\frac{\partial J_{t+1}\left(H_{t+1}, R_{t+1}^d\right)}{\partial H_{t+1}} e(\theta_t)\left(1-\varepsilon\right)\frac{\partial h_t}{\partial R_{t+1}^d} + \frac{\partial J_{t+1}\left(H_{t+1}, R_{t+1}^d\right)}{\partial R_{t+1}^d} = 0 \tag{21}$$

$$\beta\frac{C_t}{C_{t+1}}\frac{\partial J_{t+1}\left(H_{t+1}, R_{t+1}^d\right)}{\partial H_{t+1}}\left(e'(\theta_t)\left(1-\theta_t\frac{\partial h_t}{\partial b_t}\right) + e(\theta_t)\frac{\partial h_t}{\partial b_t}\right) = W_t \tag{22}$$

Equation (21) characterizes the bank's optimal deposit rate choice. The bank faces a trade-off: it has an incentive to promise low rates to existing depositors (to maximize profit margins) but must offer competitive rates to attract new ones. Raising the deposit rate R_{t+1}^d attracts more searching households ($\partial h_t/\partial R_{t+1}^d > 0$ from Lemma 2), leading to more new matches $e(\theta_t)h_t$. Each new match is valued at the shadow price $\partial J_{t+1}/\partial H_{t+1}$, which represents the present discounted value of future net interest margins. However, a higher promised rate directly reduces the value of the bank by $\partial J_{t+1}/\partial R_{t+1}^d = -H_{t+1}S_{t+1}$ (from Lemma 3), eroding profit margins on the entire existing deposit base. The optimal rate balances these two effects, with the weight $(1-\varepsilon)$ reflecting the matching elasticity.

Equation (22) characterizes the bank's optimal deposit officer hiring. Hiring an officer affects future matches through two channels: (i) by directly increasing the matching probability ($e'(\theta_t) > 0$), which raises the probability that a searching household forms a match; and (ii) by potentially influencing household search effort allocation ($\partial h_t/\partial b_t$ from Lemma 2), as more officers make the bank more attractive relative to competitors. The term $(1-\theta_t\frac{\partial h_t}{\partial b_t})$ captures the net effect: when $\theta_t\frac{\partial h_t}{\partial b_t} < 1$, the direct matching effect dominates. This total effect is valued at the shadow price of a depositor relationship $\partial J_{t+1}/\partial H_{t+1}$, discounted to today by $\beta C_t/C_{t+1}$. Hiring additional deposit officers incurs the real wage W_t, which must equal the expected marginal benefit.

4.1 Definition of Equilibrium

Combining with the market-clearing conditions, we define the symmetric equilibrium.

Definition 1 (Symmetric Equilibrium) *Given initial household saving S_0, initial depositor base $\mathbf{H}_0 = \mathbf{0}$, and firms' initial debt obligation D_0, a symmetric equilibrium in the economy consists of a sequence of prices and rates $\{R_{t+1}, W_t, R_{t+1}^d\}$, a sequence of allocations $\{C_t, S_{t+1}, N_t, h_t, H_{t+1}, l_t, k_t, D_{t+1}, b_t\}$, and a sequence of best responses $\left\{R_{it+1}^d, b_{it}\right\}_{i\in\{1,2,\cdots,M\}}$, such that, in periods $t = 0, 1, 2, \ldots$*

1. *Given the wage W_t and deposit rate R^d_{t+1}, the household allocation solves the optimization problem in* (1) *subject to Equations* (2), (5), (6), *and* (7).

2. *Given the wage W_t and interbank rate R_{t+1}, the firm allocation solves the problem in* (10) *subject to financing constraint* (9).

3. *Banks choose the number of deposit officers and the deposit rate to maximize their value* (12), *subject to Equations* (5) *and* (6). *There is a fixed point such that $b_t = b_{it}$ and $R^d_{t+1} = R^d_{it+1}$, for any $i \in \{1, 2, \cdots, M\}$.*

4. *Unmatched households are distributed evenly across banks, $h_t = \frac{1-\lambda M H_t}{M}$.*

5. *The following market-clearing conditions hold.*

   - *For the inter-bank market,*

   $$D_{t+1} = M H_{t+1} S_{t+1} \tag{23}$$

   - *For the labor market*

   $$N_t = l_t + M b_t \tag{24}$$

4.2 Optimal Deposit Pricing

In this section, we characterize the steady-state equilibrium of banks' pricing optimization. We neglect all time subscripts for simplicity.

Proposition 1 *The optimal deposit rate is given by*

$$R^d = \omega R + (1-\omega) R^0, \quad \textit{with } \omega = \frac{(M-1)(1-\varepsilon)[1-L(\theta;\lambda)]}{(M-1)(1-\varepsilon)[1-L(\theta;\lambda)] + \varepsilon M}. \tag{25}$$

where $L(\theta;\lambda) \equiv 1 - \frac{(1-\lambda)\{1-\beta\lambda[1-e(\theta)]\}}{1-\beta\lambda}$ captures the effective survival rate of deposit relationships.

Proposition 1 reveals that the equilibrium deposit rate is a weighted average of the interbank rate R and the cash yield R^0. The interbank rate R represents the bank's opportunity cost of funds, while R^0 represents the household's outside option (the return on cash). The weight ω on R measures the degree to which banks pass through changes in their funding costs to depositors—this is the deposit beta. The weight depends on three parameters: (i) matching elasticity ε, which determines how responsive matches are to changes in market tightness; (ii) deposit market competition M, which affects the intensity of price competition; and (iii) the degree of depositor inertia λ, which determines how sticky depositor relationships are.

The formula shows that the deposit beta ω is increasing in competition (M) and decreasing in depositor inertia (λ). When competition is intense or depositors are active, banks must pass through more of their funding cost changes to remain competitive. Conversely, when depositors are inert, banks can insulate depositors from funding cost changes, leading to a lower deposit beta.

The matching elasticity ε governs how congestion scales with additional search in the deposit market. Under Cobb–Douglas matching (used in the quantitative exercise below), a bank's marginal gain from attracting additional searchers depends on $e(\theta) - \theta e'(\theta) = (1-\varepsilon)e(\theta)$. When $\varepsilon \to 1$, additional search is fully offset by congestion, so raising promised rates does little to increase new matches; banks therefore set R^d close to the outside option R^0 and the deposit beta ω tends to zero. Conversely, when $\varepsilon \to 0$, congestion effects are weak and the market-share response to promised rates is strong; competition forces R^d toward the funding cost R and $\omega \to 1$.

Proposition 2 then summarizes how the deposit market competition M affects deposit rate and deposit beta.

Proposition 2 *For any given λ and θ,*

$$\frac{\partial R^d}{\partial M} > 0, \quad \frac{\partial^2 R^d}{\partial M \partial R} > 0 \tag{26}$$

Proposition 2 implies that with more banks vying for depositors, each bank must offer a higher rate to attract and retain customers. The economic mechanism is straightforward: as the number of competitors increases, each bank's market share becomes more sensitive to its deposit rate relative to competitors. This intensifies price competition, forcing banks to offer rates closer to their marginal cost of funds (the interbank rate R).

Moreover, the passthrough of changes in the interbank rate R to the deposit rate R^d is stronger when there are more banks. In other words, the deposit beta $\partial R^d/\partial R$ is increasing in M. This occurs because in a more competitive market, banks have smaller profit margins and cannot absorb changes in funding costs as easily; they must adjust deposit rates more fully to remain competitive. The second-order effect $\partial^2 R^d/(\partial M \partial R) > 0$ confirms that the sensitivity of deposit rates to funding costs increases with competition.

Proposition 3 *For any given M and θ,*

$$\frac{\partial R^d}{\partial \lambda} < 0, \quad \frac{\partial^2 R^d}{\partial R \partial \lambda} < 0 \tag{27}$$

Proposition 3 yields two main predictions that capture how depositor inertia creates market power. First, greater depositor inertia (a higher λ) leads to a lower equilibrium deposit rate. When depositors are less likely to leave, banks can exploit their locked-in relationships by offering lower rates without fearing immediate outflows. This is a manifestation of market power derived from customer stickiness: banks extract rents from inert depositors who are unlikely to search for better rates.

Second, the passthrough from the interbank rate to the deposit rate is weaker when depositor inertia is high ($\partial^2 R^d/(\partial R \partial \lambda) < 0$). Banks with a sleepy depositor base can afford to insulate depositors from changes in their own funding costs, leading to a lower deposit beta. The economic intuition is that when depositors are inert, banks face less competitive pressure to adjust rates in response to funding cost changes. They can maintain wider spreads during periods of rising interest rates, effectively extracting more surplus from their locked-in customer base. This result aligns with the empirical evidence presented in Section 8, where banks with more core deposit or fewer complaints exhibit less complete adjustment of deposit rates to market interest rate changes.

5 Numerical Analysis

This section presents a quantitative exploration of the model's equilibrium properties. We first outline our parameter choices and functional form assumptions. We then analyze the steady-state effects of two key determinants of deposit market outcomes: depositor inertia and bank competition. Finally, we examine the dynamic consequences of a merger shock.

Table 1 summarizes our baseline parameter values, chosen to be consistent with standard quarterly macroeconomic models and the empirical banking literature. The discount factor $\beta = 0.99$ implies an annual steady-state real interest rate of approximately 4%. The capital share $\alpha = 1/3$, depreciation rate $\delta = 0.025$, and normalized productivity $A = 1$ are standard in the RBC literature. The labor supply parameters $\Psi = 1.75$ and $\phi = 2$ are chosen to generate an empirically plausible Frisch elasticity.

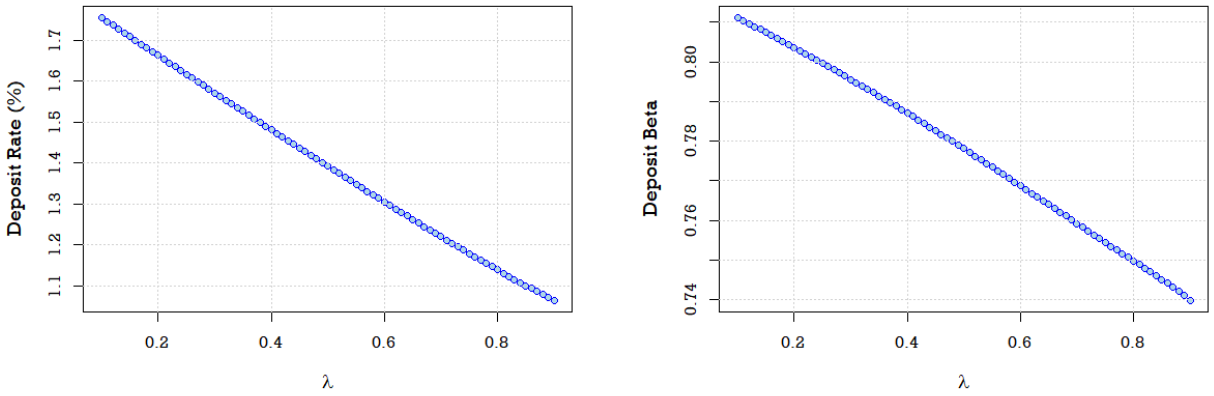
The matching function in the deposit market is specified as Cobb-Douglas, $m(h, b) = z\, b^{\varepsilon} h^{1-\varepsilon}$, where $z = 1$ is matching efficiency and $\varepsilon = 0.1$ governs the elasticity of matches with respect to bank recruiting effort (deposit officers). This specification implies a matching probability $e(\theta) = m(1, \theta) = z\, \theta^{\varepsilon}$, so that ε is also the elasticity of the match probability with respect to tightness. The depositor inertia parameter $\lambda = 0.9$ implies that 90% of existing deposit relationships survive each quarter, consistent with the high degree of stickiness observed in retail banking.

Table 1: Model Parameters

Parameter	**Value**	**Description**
λ	0.9	Relationship survival probability (depositor inertia)
β	0.99	Discount factor
R^0	1	Gross return on cash
ε	0.1	Matching elasticity
z	1	Matching efficiency
α	1/3	Capital share in production
A	1	Total factor productivity
δ	0.025	Depreciation rate of capital
Ψ	1.75	Labor disutility scale
ϕ	2	Frisch elasticity

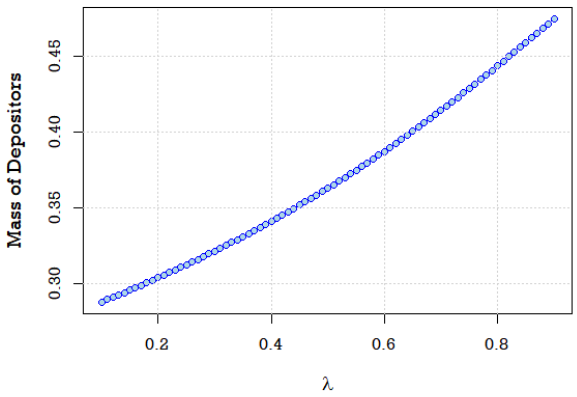
5.1 Role of Depositor Inertia

Figure 1 presents the steady-state effects of varying the depositor inertia parameter λ. As shown in panel (a), the equilibrium deposit rate R^d is decreasing in λ. When depositors are more inert (higher λ), banks face less competitive pressure to attract and retain customers. This allows banks to sustain lower deposit rates while maintaining their depositor base, effectively extracting greater rents from their locked-in customers. Panel (b) shows that the deposit beta, the sensitivity of R^d to changes in the interbank rate R, also declines with λ. This occurs because banks with a sleepy depositor base can afford to insulate depositors from changes in their own funding costs, leading to incomplete passthrough.

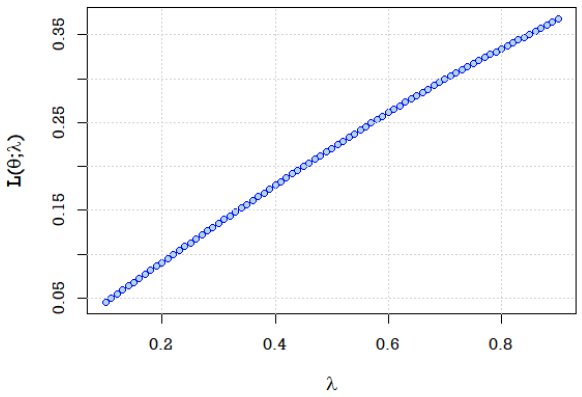


(a)

(b)



(c)



(d)

Figure 1: Steady-State Effects of Varying Depositor Inertia λ

Notes: The figure shows the equilibrium deposit rate R^d, the deposit beta $\partial R^d/\partial R$, the mass of depositors in relationships H, and the effective relationship survival rate $L(\theta;\lambda)$ as functions of λ.

The intuition is further clarified in panels (c) and (d). A higher λ directly increases the stock of depositors in relationships (H) and the effective survival rate of deposit relationships $L(\theta;\lambda)$. The combination of a larger, more stable depositor base reduces the marginal value to a bank of attracting an additional depositor through competitive rate offerings, thus depressing both the level and the sensitivity of deposit rates.

5.2 Role of Bank Competition

Figure 2 illustrates the steady-state effects of varying the number of banks M, which serves as our proxy for the intensity of competition in the deposit market. Panel (a) confirms that, as the number of banks increases, the equilibrium deposit rate rises. With more competitors, each bank must offer a more attractive rate to attract and retain depositors. Panel (b) shows that the deposit beta is also increasing in M. In a more competitive market, banks have slimmer profit margins and cannot absorb changes in funding costs as easily; they must adjust deposit rates more fully to remain competitive, leading to greater passthrough. The endogenous adjustment of bank search effort and relationship dynamics introduces a second-order mitigating channel. As bank competition weakens and profit margins widen, banks face heightened incentives to expand investment in deposit officers (b). This raises the matching rate, enlarges the stock of depositors in established relationships (H), and affects the effective relationship survival rate $L(\theta;\lambda)$. These responses partially counteract the downward pressure on deposit rates that would otherwise follow from reduced competition, though the direct competition effect dominates.

5.3 Role of Merger Episodes

In this section, we consider a merger episode in which the number of banks permanently decreases by 10%. We model a merger as a reduction in the number of active banks from M_t at the beginning of period t to $M_{t+1} < M_t$. For tractability, we assume that the economy comprises a continuum of counties, each with an integer number of banks. The aggregate number of banks, M_t, can thus be a decimal, representing the average across counties. When $M_t - M_{t+1}$ banks disappear due to merger, we assume their depositor relationships are reallocated evenly among the surviving banks.

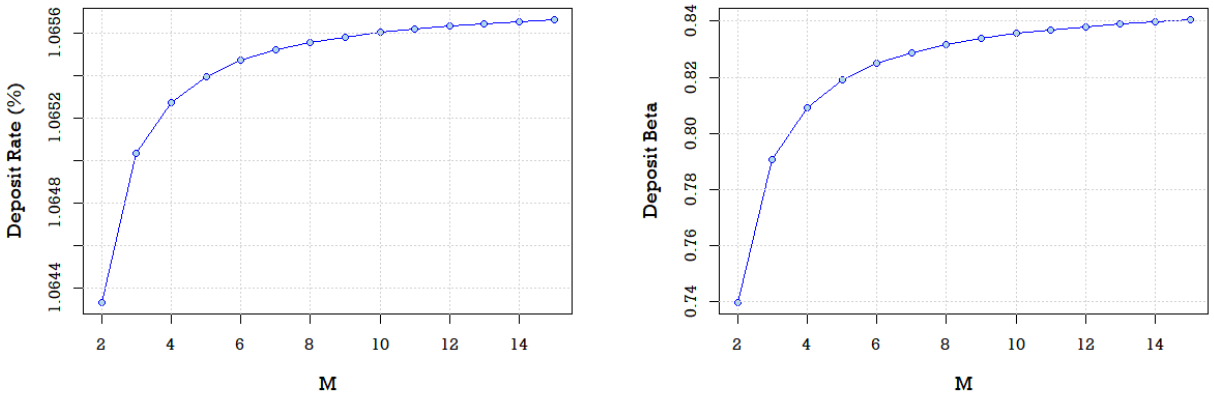
Let H_t^d denote the average depositor base of the disappearing banks. By symmetry, $H_t^d = H_t$. The aggregate adding-up constraint for depositors in period t becomes:

$$\sum_{i=1}^{M_{t+1}} h_{it} + \sum_{i=1}^{M_{t+1}} \lambda \left(H_{it} + \frac{(M_t - M_{t+1}) H_t^d}{M_{t+1}} \right) = 1. \tag{28}$$

Moreover, the law of motion for the depositor base of a surviving bank i adjusts to:

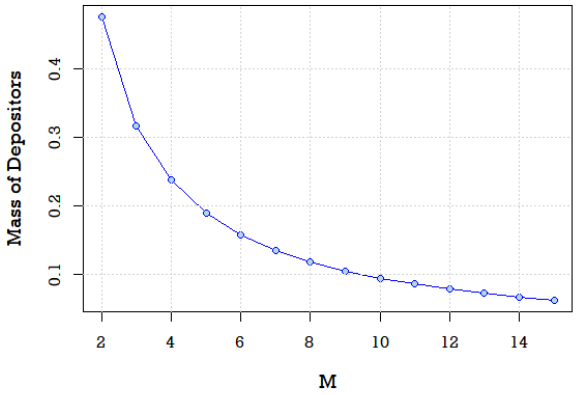
$$H_{it+1} = e(\theta_{it}) h_{it} + \lambda \left(H_{it} + \frac{(M_t - M_{t+1})\, H_t^d}{M_{t+1}} \right) \tag{29}$$

Figure 3 plots the impulse responses of key variables following a permanent 10% reduction in the number of banks. The merger has two main implications. First, the deposit rate R_t^d

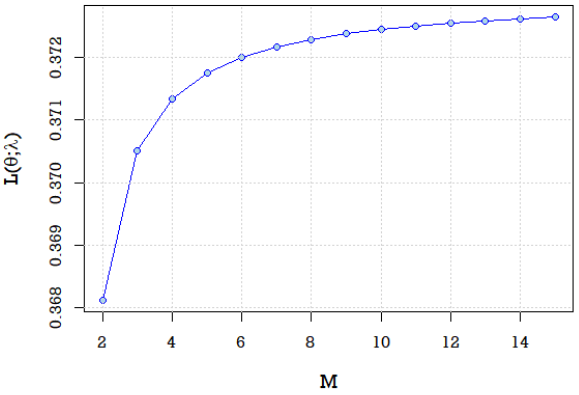


(a)

(b)



(c)



(d)

Figure 2: Steady-State Effects of Varying the Number of Banks M

Notes: The figure shows the equilibrium deposit rate R^d, the deposit beta $\partial R^d/\partial R$, the mass of depositors in relationships H, and the effective relationship survival rate $L(\theta;\lambda)$ as functions of M.

declines on impact and converges to a new, lower steady state. The reduction in competition allows the surviving banks to offer less attractive deposit terms, exploiting their increased market power. Second, the deposit beta—the sensitivity of R_t^d to changes in the interbank rate R_t—also falls persistently. This indicates that the passthrough of monetary policy to deposit rates becomes weaker and more sluggish after the merger.

The persistence in the decline of the deposit beta stems from the stickiness of the depositor base, captured by the parameter λ. Because depositor relationships adjust only gradually, banks face a muted competitive threat in the short run. The surviving banks can maintain wider spreads without immediately losing customers, as inert depositors are slow to search for better rates.

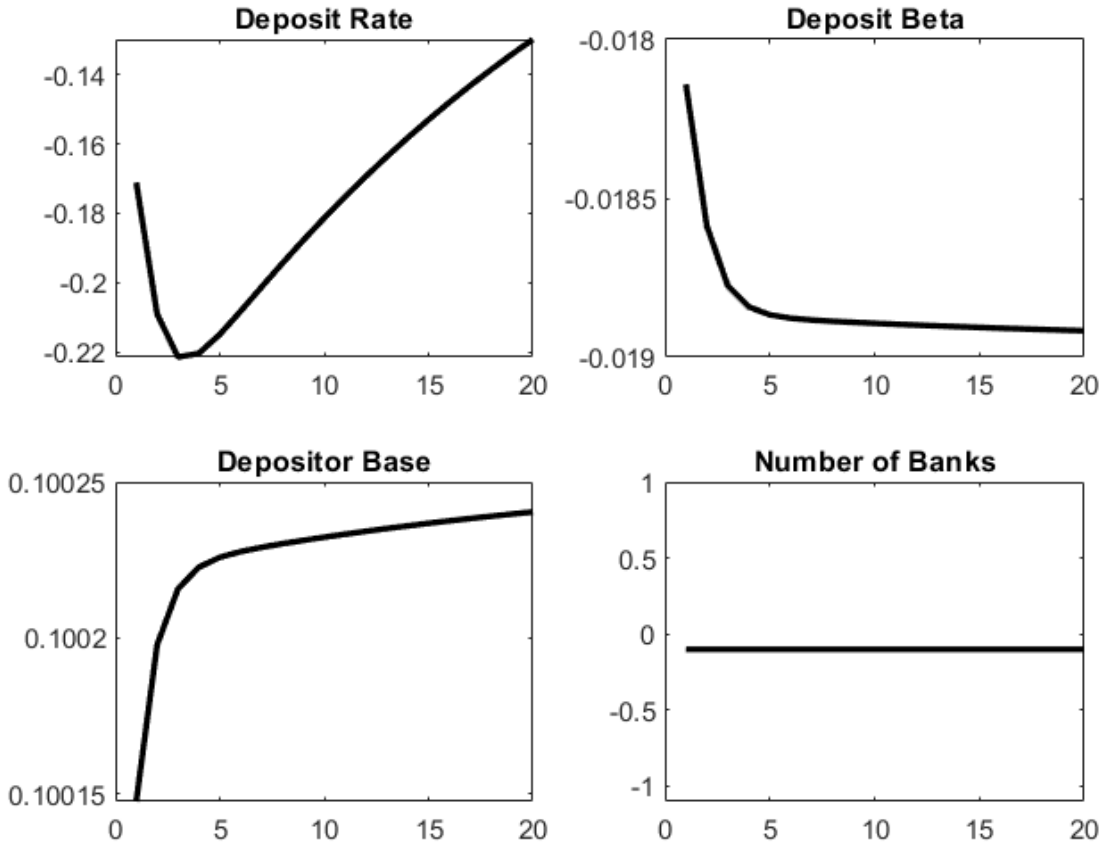


Figure 3: Impulse Responses to a Permanent 10% Reduction in the Number of Banks

Notes: The figure shows the dynamic paths of the deposit rate R_t^d, the deposit beta $\partial R_t^d / \partial R_t$, the depositor base H_t, and the effective survival rate $L(\theta_t; \lambda)$ following a merger shock.

The model predicts that the effects of a merger are heterogeneous and depend critically on the degree of depositor inertia. Figure 4 compares the impulse responses for two economies that differ only in the value of λ: one with high inertia ($\lambda = 0.9$, representing "sleepy" depositors) and one with low inertia ($\lambda = 0.3$, representing "active" depositors).

In the high-λ economy, the post-merger decline in the deposit rate is attenuated because

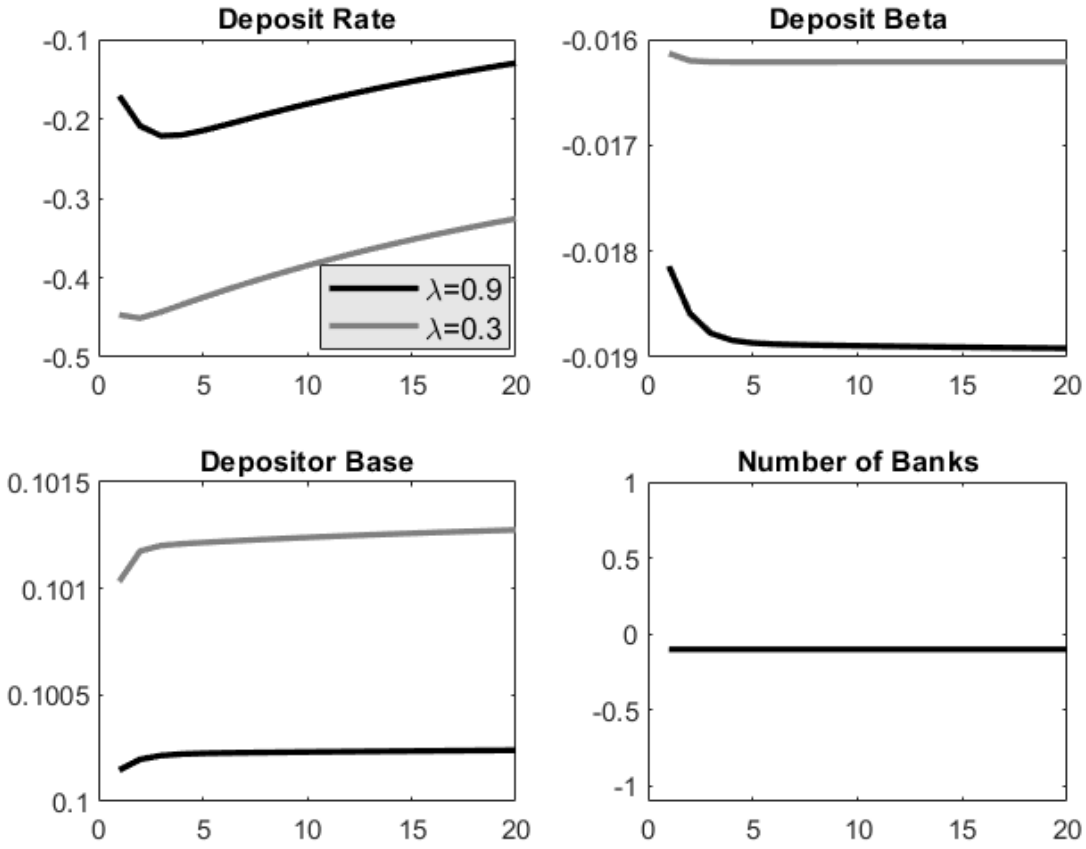


Figure 4: Dynamics after 10% banks being acquired

the steady-state deposit rate is already relatively low. More importantly, the deposit beta falls more substantially. With highly sticky depositors, surviving banks can quickly consolidate market power without fearing customer attrition, thereby gaining strong incentives to lower deposit betas. By contrast, in the low-λ economy, depositors are more likely to shop around and switch banks. This residual competitive discipline constrains the surviving banks' ability to exploit the merger, leading to a smaller reduction in deposit betas. This result is consistent with empirical findings in Section 8: banks with more core deposit or fewer customer complaints exhibit a reduction in deposit rate passthrough.

The dynamics of the depositor base further underscore the mechanism. In the high-λ economy, the stock of depositors in relationship H_t increases by less after the merger. This is because the pool of active searchers h_t is smaller, and the matching function $m(h_t, b_t)$ generates fewer new matches. With fewer new relationships being formed, the surviving banks rely more heavily on their inherited, inert depositor base. This reinforces their market power and contributes to the greater decline in the deposit beta. In contrast, in the low-λ economy, a larger fraction of depositors remains active in search, sustaining a higher flow of new matches and placing a competitive pressure on the surviving banks.

5.4 Role of Monetary Policy Shock

We next study how monetary policy transmits through retail deposit market power in the calibrated economy. In the model, the relevant object for deposit pricing is the wedge between banks' investment opportunity and households' outside option. We therefore model a monetary-policy disturbance as an exogenous change in the cash outside-option return R_t^0. Concretely, we consider an innovation that raises R_t^0 so that the net opportunity-cost wedge

$$i_t \equiv R_t - R_t^0 \tag{30}$$

falls by 100 basis points on impact, and then mean reverts according to an AR(1) process.

Figure 5 reports the resulting dynamics for the wedge i_t, the deposit beta, the relationship base H_t, and aggregate output. The increase in R_t^0 makes the outside option more attractive and compresses the rents banks earn on relationship deposits. Because deposit relationships adjust sluggishly, banks cannot instantaneously rebuild the relationship base through new matching. Instead, the equilibrium adjustment occurs primarily through deposit pricing: banks reoptimize R_t^d to limit disintermediation toward the outside option. This repricing increases the sensitivity of deposit rates to the market environment—that is, the endogenous deposit beta rises on impact—but it does so by sacrificing intermediation rents on a large stock of existing relationships. The resulting decline in the net interest margin reduces the value of expanding deposit capacity, lowers effective deposit-market tightness, and slows relationship accumulation. With fewer relationship-funded deposits, bank lending contracts through the deposit-funding constraint, tightening firms' financing condition and reducing output.

The response is heterogeneous in depositor inertia. When λ is higher, the economy starts from a larger and more captive relationship base, so the shock affects a larger inframarginal mass of deposits. Consequently, banks' pricing response has a larger effect on aggregate intermediation rents, and the contraction in output is more persistent and hump-shaped.

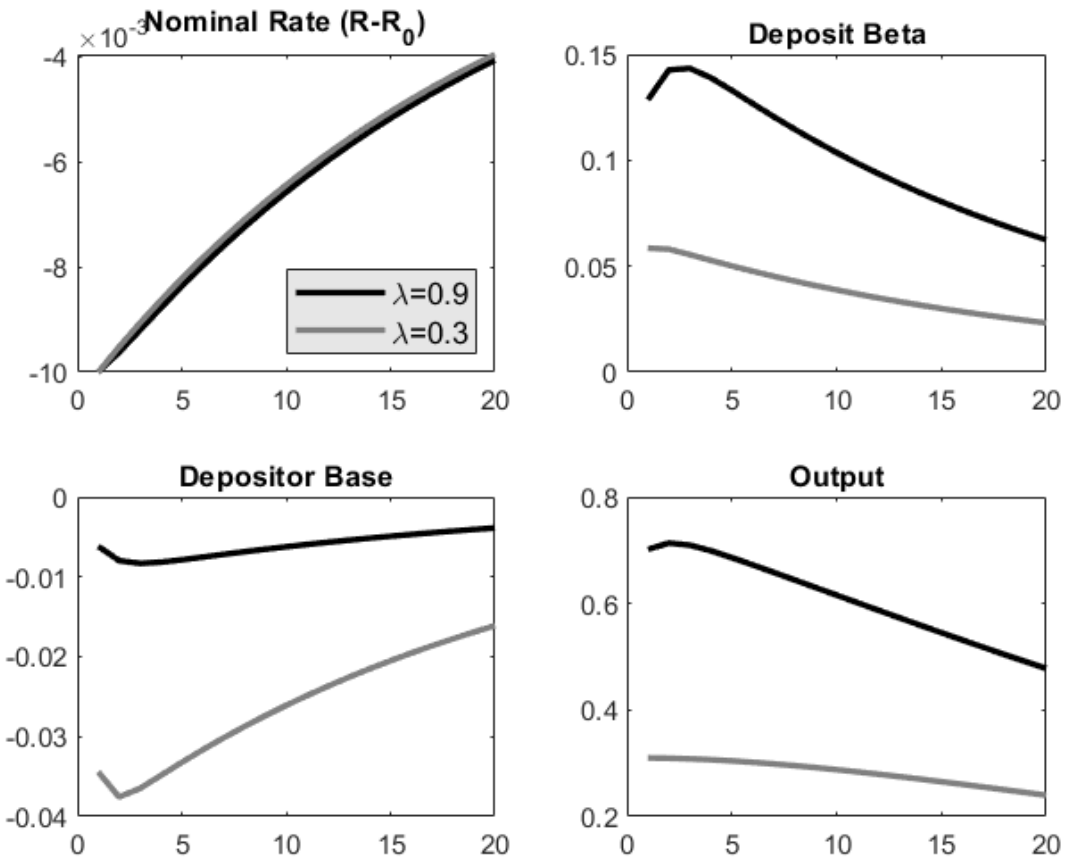


Figure 5: Dynamics after 1% nominal rate decrease

At the same time, because the outside option becomes relatively more attractive for the marginal searching households, banks must raise the responsiveness of offered rates more aggressively to stabilize their funding base, generating a larger increase in the deposit beta. This amplification mechanism is the quantitative counterpart of the paper's core insight: depositor inertia endogenously strengthens deposit-market power in normal times, and shifts in the outside option translate that market power into stronger macroeconomic effects through deposit-rate setting and relationship dynamics.

6 Testable Implications

This section bridges the model to the empirical design by stating a small set of testable implications for deposit pricing and deposit betas. The model delivers sharp comparative statics for (i) depositor inertia, captured by the relationship survival probability λ (Proposition 3), and (ii) competition intensity, captured by the effective number of competitors M (Proposition 2). These objects discipline how deposit rates respond to changes in market rates. In the empirics, we map λ to the "sleepiness" of a bank's depositor base (proxied by core deposit and complementary measures), and we use local market structure and M&A shocks as sources of variation in effective competition.

6.1 Economic mechanism and empirical mapping

In the model, banks compete in local deposit markets (e.g., counties or MSAs). Depositors value transactional convenience and relationships, but to access rate information and switch banks they must incur search and switching costs. These frictions generate heterogeneity in depositor activeness:

- **Active depositors** search across banks and are responsive to rate differentials.
- **Sleepy depositors** do not actively search each period and are relatively insensitive to rate changes. In the empirics, we proxy for a larger sleepy segment using *core deposit* and complementary measures of customer-base captivity.

Banks set deposit rates to maximize profits given the (endogenous) deposit supply they face. Because search frictions make deposit supply less elastic, banks can sustain a wedge between market rates and deposit rates (deposit spreads), and that wedge varies with both (i) depositor inertia and (ii) competition.

6.2 Deposit spreads and deposit betas

Let R_t denote a market rate that summarizes the opportunity cost of deposits (e.g., the federal funds rate or a Treasury yield). Let R^d_{ipt} be bank i's offered deposit rate for a given product p. Define the **deposit spread** as

$$s_{ip,t} \equiv R_t - R^d_{ipt}. \tag{31}$$

The **deposit beta** is the passthrough of R_t into R^d_{ipt}:

$$\beta_{ipt} \equiv \frac{\partial R^d_{ipt}}{\partial R_t}. \tag{32}$$

In spread form,

$$\frac{\partial s_{ipt}}{\partial R_t} = 1 - \beta_{ipt}. \tag{33}$$

Therefore, in regressions where the dependent variable is *changes in spreads* and the key regressor is *changes in* R_t, a *larger* coefficient on ΔR_t corresponds mechanically to a *lower* deposit beta (weaker passthrough).

6.3 Testable implications for the empirical work

The search-based mechanism implies:

1. **Depositor captivity (λ) and passthrough (Proposition 3).** Higher depositor inertia (a larger λ) lowers offered deposit rates and increases spread passthrough ($\partial s/\partial R$), implying *lower deposit betas* $\beta^{dep} = 1 - \partial s/\partial R$. In the empirics, we proxy for captivity using core deposit and related customer-base measures, and we proxy for lower effective captivity using complaint-based measures of depositor attention/search (Sections 8.3 and 8.6).

2. **Competition (M) and passthrough (Proposition 2).** Greater competition (higher effective M) raises offered deposit rates and lowers spread passthrough, implying *higher deposit betas*. Empirically, we study competition through local shocks around M&A and spillovers to other banks in the same region (Sections 8.4 and 8.5).

3. **Merger shocks ($M \downarrow$) (Numerical Analysis).** A merger reduces effective competition and should lower offered rates and deposit betas (increase spread passthrough) on impact and in the new steady state. We test these predictions using merger event studies for rate levels and passthrough (Section 8.5; Figure 9; Figure 10; Table 8).

4. **Interactions: mergers matter more when captivity is high.** The model implies that the passthrough effects of reduced competition are amplified when the customer base is relatively captive (high effective λ). We test this using interactions between merger exposure and core deposit and by relating post-merger changes in customer-base measures to repricing and passthrough.

The empirical sections are organized around these predictions: we (i) document how proxies for depositor attention and customer-base captivity relate to rate levels, (ii) estimate passthrough and map coefficients to deposit betas via $\beta^{dep} = 1 - \partial s/\partial R$, and (iii) use M&A episodes and regional spillovers as shocks to effective competition.

7 Data

This paper combines three data sources to measure (i) retail deposit pricing, (ii) depositor frictions and attention, and (iii) bank balance-sheet quantities and merger activity. The unit of observation is a bank–time panel. Deposit rates are observed at monthly frequency (by product) across bank branches and are aggregated to bank-quarterly level in order to merge with quarterly bank characteristics and merger indicators; where necessary, we construct product-specific samples.

7.1 Deposit rates from RateWatch

Retail deposit rates are obtained from RateWatch, which reports posted branch-level rates for standard retail deposit products at monthly frequency. We focus on three main interest-bearing deposit products—12-month certificates of deposit (12 Mo CD), money market accounts (MM), and savings accounts—and construct bank-level offered rates for each product by aggregating across a bank's observed branches. These series form the primary outcomes for the deposit-pricing and passthrough tests.

7.2 Deposits and M&A activity from Call Reports

Balance sheet quantities and bank characteristics are obtained from quarterly FFIEC Call Reports. These data are used to construct core deposit measures (levels and growth rates) and other bank controls. M&A activity and successor–predecessor relationships are identified using regulatory reporting information so that merger timing can be aligned to event time in quarterly frequency. For merger-based event studies, quarter $t = 0$ denotes the quarter of merger completion, and event-time indicators are constructed for a symmetric window around $t = 0$.

7.3 Consumer complaints from the CFPB Consumer Complaint Database

Consumer complaints are drawn from the Consumer Financial Protection Bureau's Consumer Complaint Database. Complaints are mapped to depository institutions and aggregated over time to create complaint intensity measures. In addition to complaint counts (and transformations such as logs), the analysis uses a scale-adjusted measure that divides complaints by core deposit (from Call Reports) to proxy for complaint intensity per unit of relationship funding. Motivated by the model, we interpret higher complaint intensity as an indicator of heightened depositor attention and lower effective captivity, which would associate with higher deposit betas.

7.4 Merging and alignment across sources

The RateWatch rates, CFPB complaints, and Call Report variables are merged using regulatory identifiers and bank names.

Rates–complaints alignment. The CFPB reports the consumer mailing address, while RateWatch is branch-based. We construct a bank–state–month panel to study rates and CFPB complaints at higher frequency, treating the consumer's state as the relevant location for the complaint and using the bank's observed branches in the same state to construct the rate measure. For analyses that require Call Report balance-sheet variables and merger timing, we aggregate outcomes and complaints to bank–quarter.

Quarterly alignment and mergers. We aggregate complaints and RateWatch rates to the bank–quarter level to merge with Call Reports. Around merger events, predecessor observations are rolled into the surviving bank when constructing customer-base measures, such as core deposit, to capture the consolidated relationship base relevant for deposit pricing.

8 Empirical Strategy and Results

This section tests the implications of the search-based deposit market power mechanism outlined in Section 6. The core object of interest is the *deposit beta* – the passthrough of market rates into offered deposit rates—and how it varies with (i) depositor search frictions or customer-base "sleepiness" and (ii) local deposit-market structure.

8.1 Measuring passthrough and mapping to deposit betas

We estimate passthrough using product-level panel regressions that relate changes in offered deposit rates (or changes in spreads relative to a benchmark rate) of a product p at a bank i to changes in the benchmark market rate R_t (e.g., the federal funds target or the effective federal funds rate) at time t. When the dependent variable is the change in the *deposit spread* $s_{ipt} = R_t - R^d_{ipt}$, the coefficient on ΔR_t maps directly into deposit betas:

$$\Delta s_{ipt} = \alpha_i + \phi_p \, \Delta R_t + \varepsilon_{ipt} \quad \Rightarrow \quad \beta^{dep}_p \approx 1 - \phi_p. \tag{34}$$

More generally, when we interact ΔR_t with bank characteristics $Z_{i,t}$, we obtain heterogeneity in passthrough:

$$\Delta s_{it} = \alpha_i + \phi_p \, \Delta R_t + \theta_p \, (\Delta R_t \times Z_{it}) + \gamma \, Z_{it} + \varepsilon_{ipt}, \tag{35}$$

so that the implied deposit beta varies with Z as $\beta^{dep}_p(Z) \approx 1 - (\phi_p + \theta_p Z)$. Under the search-based mechanism, proxies for a sleepier depositor base (e.g., higher core deposit) should *increase* spread passthrough (higher $\phi_p + \theta_p Z$) and therefore *reduce* deposit betas.

Table 2 provides an unconditional benchmark. A one percentage point increase in the federal funds rate is associated with an increase in spreads of about 0.77 for 12-month CDs, 0.95 for money market accounts, and 0.97 for savings. The negative interaction term implies smaller spread increases during rate hikes than the magnitude of spread decreases during rate cuts (i.e., some asymmetry in spread passthrough). Using $\beta^{dep} \approx 1 - \partial s / \partial R$, these estimates imply average deposit betas of roughly 0.23 (CD), 0.05 (MM), and 0.03 (savings): banks adjust deposit rates only partially to market-rate movements, particularly for products with flexible maturity. This pattern is consistent with substantial depositor inertia (high effective λ) and motivates the heterogeneity test on depositor captivity.

Table 2: Baseline deposit beta (passthrough to spread)

	(1) 12 Mo CD	(2) MM	(3) Savings
dfed	0.765***	0.950***	0.973***
	(0.00332)	(0.00192)	(0.000992)
dfed*dummy_fedup	-0.0778***	-0.0488***	-0.0196***
	(0.00375)	(0.00222)	(0.00111)
Constant	0.00826***	0.00595***	0.00430***
	(0.000258)	(0.000151)	(7.55e-05)
Observations	158,161	150,155	147,045
R-squared	0.747	0.941	0.983
Time FE	N	N	N
Bank FE	Y	Y	Y

Robust standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

8.2 Key covariates: depositor search frictions and local market structure

The mechanism in Section 6 emphasizes two empirical inputs:

1. **Customer-base "sleepiness" / depositor search frictions.** We proxy for a captive (sleepy) depositor base using core deposit and for depositor attention/search using complementary behavioral indicators. Intuitively, a larger sleepy segment makes deposit supply less elastic, lowering deposit betas.

2. **Local deposit-market structure.** A bank competes in the set of local markets where it operates. We therefore aim to construct market structure measures (e.g., effective number of competitors and concentration/HHI) at the market level and use bank-market level regressions to show relevance. The model predicts that higher concentration lowers deposit betas, especially when depositor search is weak. To address endogeneity concerns in market structure, we also use M&A episodes as local shocks that plausibly shift effective competition and depositor captivity.

8.3 Implication 1: Depositor captivity (λ) and deposit pricing

This subsection provides the evidence related to depositor captivity (mapped in the model to a higher relationship survival probability λ) and its implications for both the *level* of deposit rates and the *passthrough* of market rates into deposit rates. The model predicts that greater captivity lowers offered rates and lowers deposit betas (Proposition 3). In the empirics, we proxy for higher captivity using customer-base measures tied to core deposit and for lower effective captivity using complaint-based measures of depositor attention/search.

8.3.1 Core deposit as a proxy for a captive depositor base

We begin by documenting how core deposit co-move with offered rates. While core deposit are an equilibrium outcome (banks can attract them through either pricing (Table 3) or non-price attributes such as customer service (proxied by customer complaints in Table 4), the model uses the *composition* of the depositor base, such as the share of depositors who do not actively search, as a sufficient statistic for deposit supply elasticity. The reduced-form patterns below motivate treating core deposit as a proxy for depositor "sleepiness" in the passthrough tests. We later also interact market rate with the share of uninsured/large-denomination deposit in regressions to capture how heterogeneity in depositor composition impacts deposit beta, having in mind that uninsured/large denomination deposit would be more sensitive to the movement in market rates (Tables A18 and A19).

Table 3: Log core deposit and rates

VARIABLES	MM (1)	12 Mo CD (2)	Savings (3)
rate	0.0952***	0.0323***	0.0664***
	(0.0155)	(0.00789)	(0.0246)
Constant	12.13***	12.10***	12.09***
	(0.00380)	(0.00425)	(0.00391)
Observations	145,734	153,395	143,133
R-squared	0.986	0.986	0.987
Time FE	Y	Y	Y
Bank FE	Y	Y	Y

Robust standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

8.3.2 Complaints as depositor attention/search proxies

Next we relate offered deposit rates to proxies for depositor dissatisfaction/attention and switching pressure. Table 4 documents correlations between offered rates and complaint-based measures. [1] Interpreted through the lens of the model, higher complaint intensity is consistent with a less captive customer base (lower effective inertia) and hence more elastic deposit supply, which pushes banks to offer higher rates to attract and retain customers.

[1] Note that banks in the CFPB Consumer Complaint Database are a limited subset of all the banks. Therefore the observations are small.

Table 4: Rates and complaints

	12 Mo CD			MM			Savings		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
L.dummy_complaint	0.00698			0.00354			-0.000732		
	(0.00742)			(0.00361)			(0.00280)		
L.complaint		0.00201			0.00126***			0.000867	
		(0.00171)			(0.000363)			(0.000904)	
L.log_complaint			0.0387			0.0213**			0.0152
			(0.0305)			(0.0106)			(0.0139)
Constant	0.277***	0.262***	0.166***	0.141***	0.132***	0.0903***	0.0834***	0.0748***	0.0455*
	(0.00508)	(0.0161)	(0.0522)	(0.00240)	(0.00309)	(0.0173)	(0.00189)	(0.00840)	(0.0233)
Observations	30,404	30,025	20,411	27,278	26,917	17,731	24,542	24,213	16,238
R-squared	0.672	0.672	0.622	0.763	0.769	0.760	0.829	0.830	0.808
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank-State FE	Y	Y	Y	Y	Y	Y	Y	Y	Y

Robust standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5 then introduce interactions between market-rate movements and complaint-based measures. The identifying variation is therefore *within* bank and state over time: whether banks exhibit differential spread passthrough (and hence different implied betas) in periods/locations where complaints are elevated.

Table 5: Deposit spread change on federal funds target change × complaints, bank name-state-monthly, 2012–2020

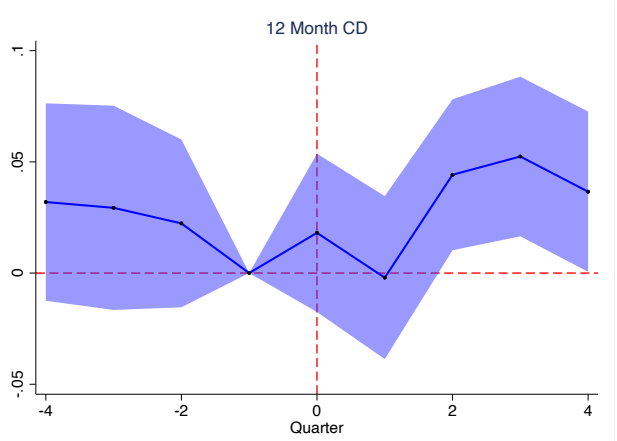
	12 Mo CD			MM			Savings		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
dfedtar × L.dummy_complaint	-0.00370			-0.00328			-0.00581		
	(0.0208)			(0.0118)			(0.00482)		
dfedtar × L.complaint		-0.000464*			0.000106			4.96e-05	
		(0.000245)			(0.000154)			(3.66e-05)	
dfedtar × L.log_complaint			-0.0111			0.00189			-0.000183
			(0.00668)			(0.00535)			(0.00119)
Constant	-0.00436***	-0.00435***	-0.00104***	-0.00130***	-0.00131***	0.00486***	-0.00548***	-0.00548***	0.000126***
	(3.14e-05)	(1.33e-06)	(8.56e-06)	(1.53e-05)	(8.34e-06)	(4.64e-05)	(4.90e-06)	(1.11e-07)	(1.21e-06)
Observations	26,549	26,549	17,297	23,435	23,435	14,688	20,428	20,428	13,085
R-squared	0.885	0.885	0.891	0.939	0.939	0.941	0.980	0.980	0.966
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank-State FE	Y	Y	Y	Y	Y	Y	Y	Y	Y

For 12-month CDs (Columns (1)-(3) in Table 5), the interaction terms based on complaint intensity are generally negative when statistically informative, most clearly for `L.complaint` $\times\Delta$ Fed Funds rate target. A negative interaction implies *lower* spread passthrough (smaller ψ) and therefore *higher* deposit betas: banks facing more complaints adjust CD rates *more* when benchmark rates move, compressing spreads. This is consistent with a "search/discipline" interpretation of complaints: periods with more consumer friction and dissatisfaction coincide with heightened depositor attention, greater willingness to shop, or higher switching propensity, limiting banks' ability to keep deposit rates rigid.

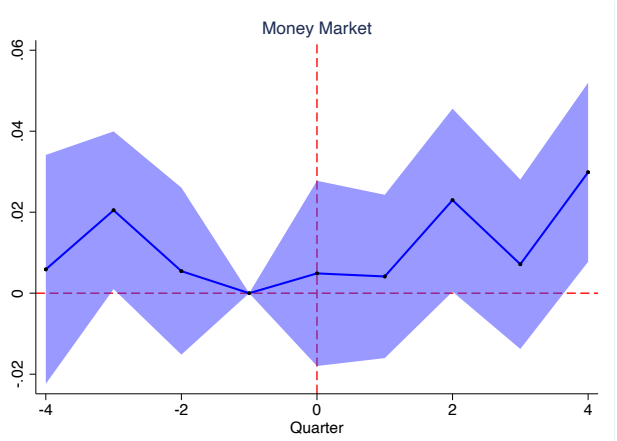
8.4 Implication 2: Competition (M) and local market structure

The model predicts that more intense competition in deposit markets (a higher effective number of competitors M) raises offered deposit rates and increases passthrough (higher deposit betas), while weaker competition lowers both (Proposition 2). Our primary empirical competition design uses M&A episodes as shocks to effective competition (Section 8.5). M&A episodes provide a natural laboratory for the model's competition channel: a merger reduces the number of competitors (lower effective M), which the model predicts should lower deposit rates and reduce deposit betas (Proposition 2 and the numerical merger exercise). Empirically, we examine both the "levels" implication (rate repricing) and the "passthrough" implication (higher spread passthrough, i.e., lower deposit betas) around merger completion.

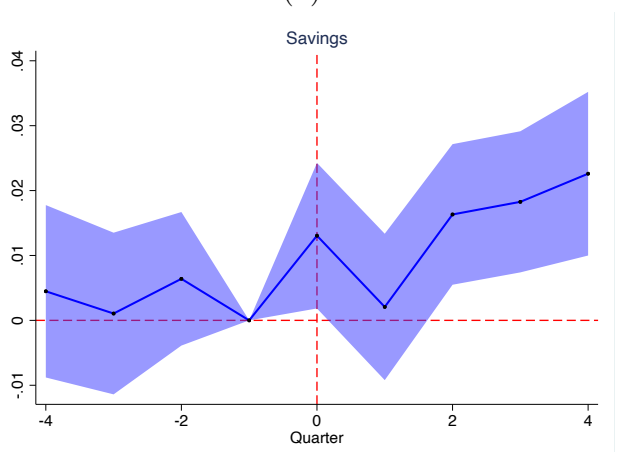
In addition, we find spillover evidence for *non-merging* banks in the same region: Figure 6 shows corresponding spread passthrough dynamics. With a M&A shock in the local deposit market, other banks who do not participate in the M&A have higher passthrough of fed funds rate to deposit spread, therefore lower deposit beta following the event, consistent with the model prediction.



(a)



(b)



(c)

Figure 6: passthrough spillovers to other banks in the same region

8.5 Implication 3: M&A shocks, depositor captivity and repricing

8.5.1 M&A and depositor captivity: core deposit

If mergers consolidate relationships and weaken competitive pressure for the banks involved in the merger, the model predicts both (i) a larger post-merger relationship base and (ii) weaker repricing of deposit rates (lower betas). We first document the facts on customer-base measured by core deposit. Table 6 shows that merger completion is associated with a discrete increase in core deposit: the coefficient on `dummy_ma` in the log specification is about 0.28, implying roughly a 32% increase in core deposit at completion (holding bank fixed effects and time fixed effects constant). The growth-rate specification similarly shows a large contemporaneous increase in core deposit growth.

Table 6: Core deposit following M&A

	(1) log_cd	(2) log_cd	(3) growth_cd	(4) growth_cd
dummy_ma	0.278***	0.277***	0.383***	0.383***
	(0.0159)	(0.0162)	(0.0414)	(0.0414)
lag_dummy_ma		0.266***		-0.00326
		(0.0162)		(0.0389)
Constant	13.00***	13.02***	-0.0172***	-0.0172***
	(0.000542)	(0.00109)	(0.00228)	(0.00228)
Observations	189,008	184,062	184,200	184,200
R-squared	0.892	0.897	0.018	0.018
Time FE	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y

Robust standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Figure 7 provides an event-study visualization: core deposit jump sharply at $t = 0$ and remain elevated for several quarters. The post-merger level gradually declines from the peak but stays well above pre-merger values, consistent with a persistent expansion in relationship funding rather than a purely transitory accounting effect.

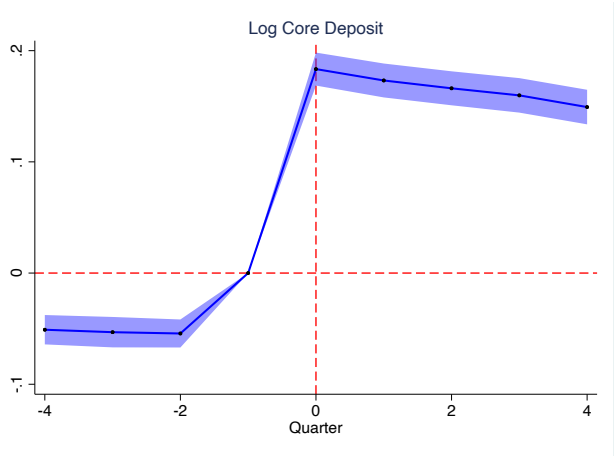


Figure 7: Event study: Core deposit around M&A

8.5.2 Deposit runoff relative to the combined pre-merger benchmark

To distinguish a mechanical consolidation effect from economically meaningful deposit retention, we compare post-merger core deposit to the combined predecessor+successor benchmark in the quarters leading up to completion. Figure 8 implement this "combined-entity" event study.

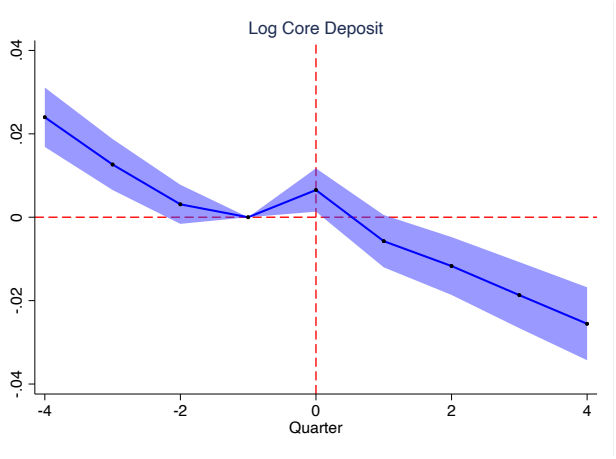


Figure 8: Event study: Combined core deposit around M&A

A useful interpretation is that Table 6 reflects the surviving bank's discrete "step up" in deposits at consolidation, while the combined-entity event study is closer to a deposit-retention diagnostic. Figure 8 shows that, relative to the pre-merger combined benchmark, post-merger combined core deposit drift downward in the quarters after completion, consistent with some integration-related runoff and/or reallocation of funding after the event. The pre-trend decline approaching $t = -1$ suggests some anticipatory deposit movements or concurrent balance-sheet adjustments around completion.

8.5.3 M&A and deposit pricing: decrease in rate and beta

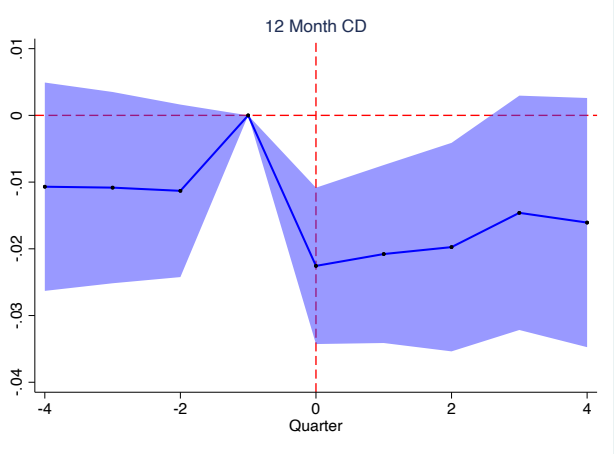
The model predicts that a reduction in effective competition ($M \downarrow$) lowers offered deposit rates. Table 7 confirms this repricing in the data. For 12-month CDs, completion is associated with a decline of about 0.017–0.021 percentage points (depending on whether a lagged merger indicator is included). For money market accounts, rates fall by about 0.007 percentage points. The savings response is smaller and not precisely estimated, consistent with transaction-like accounts being disciplined by additional non-rate margins.

Table 7: Deposit rates following M&A

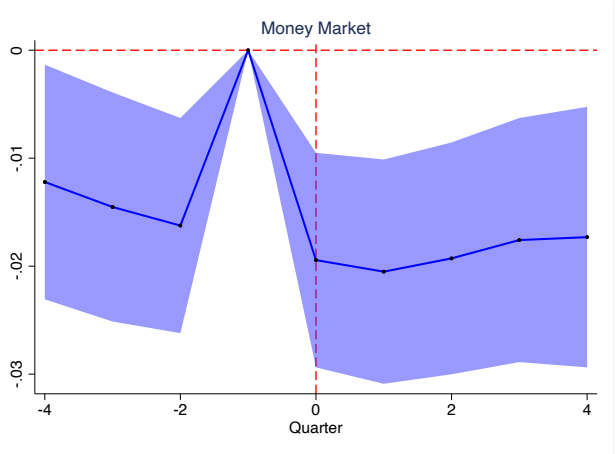
	(1) 12 Mo CD	(2) 12 Mo CD	(3) MM	(4) MM	(5) Savings	(6) Savings
dummy_ma	-0.0174***	-0.0211***	-0.00745**	-0.00729**	-0.00206	-0.00198
	(0.00576)	(0.00621)	(0.00291)	(0.00323)	(0.00198)	(0.00217)
lag_dummy_ma		-0.0161**		-0.00763**		-0.00310
		(0.00637)		(0.00332)		(0.00215)
Constant	0.516***	0.521***	0.231***	0.233***	0.138***	0.138***
	(0.000314)	(0.000655)	(0.000160)	(0.000344)	(0.000108)	(0.000230)
Observations	31,941	29,509	30,985	28,514	29,737	27,547
R-squared	0.642	0.645	0.568	0.571	0.647	0.641
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

Robust standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

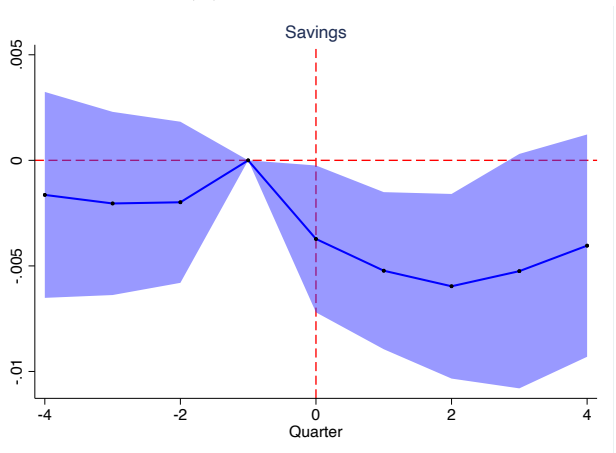
Figure 9 complements the regression evidence by showing the dynamic path of deposit rates around the event. Consistent with the table evidence, the event-study plots display a discrete downward repricing at $t = 0$ for 12-month CDs and money market accounts, while the savings response is smaller and comparatively noisy.



(a) 12-month CD

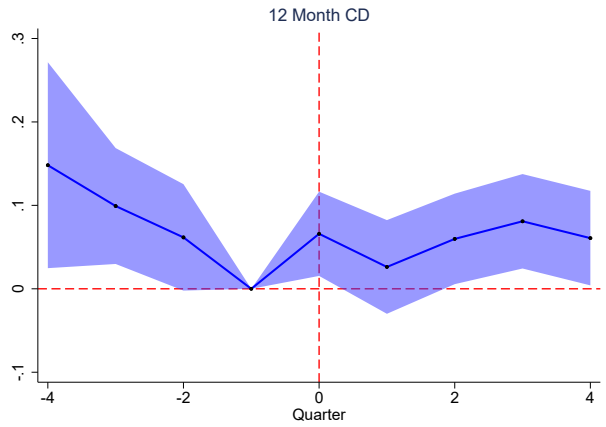


(b) Money market



(c) Savings

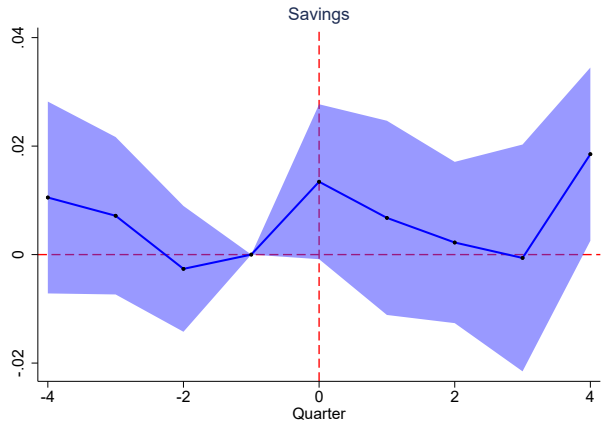
Figure 9: Event-study plots: deposit rates around M&A



(a)



(b)



(c)

Figure 10: Deposit spread passthrough around M&A

We next assess whether the discrete reduction in effective competition through M&A also translates into weaker passthrough of the baseline rate into deposit spread. Figure 10

plots event-study estimates of spread passthrough around M&A completion. Positive post-merger coefficients correspond to higher spread passthrough and therefore lower deposit betas, consistent with the model.

Table 8 provides a regression counterpart. The interaction `dfedtar_ma` is positive and statistically significant for 12-month CDs and savings in several specifications, implying that spread passthrough rises in merger windows and deposit betas fall. In economic terms, for a given market-rate move, spreads widen more (deposit rates move less) following consolidation, consistent with increased deposit-market power. The corresponding effect for money market accounts is smaller and not precisely estimated in this sample, consistent with product heterogeneity in the scope for market power.

Table 8: Deposit beta of banks upon M&A

	(1) 12 Mo CD	(2) 12 Mo CD	(3) MM	(4) MM	(5) Savings	(6) Savings
dfedtar		0.759***		0.946***		0.990***
		(0.00783)		(0.00444)		(0.00255)
dummy_ma	0.00235	-0.000562	0.000396	-0.000520	0.000505	-0.000330
	(0.00287)	(0.00302)	(0.00157)	(0.00170)	(0.000748)	(0.000990)
dfedtar_ma	0.0434*	0.0547**	0.00336	0.0105	0.00402	0.0141**
	(0.0257)	(0.0262)	(0.0150)	(0.0152)	(0.00516)	(0.00614)
Constant	0.00329***	0.000870***	0.00386***	0.000740***	0.00468***	0.00136***
	(0.000158)	(0.000169)	(8.78e-05)	(9.60e-05)	(4.10e-05)	(5.46e-05)
Observations	28,581	28,581	27,537	27,537	26,680	26,680
R-squared	0.761	0.732	0.940	0.930	0.981	0.973
Time FE	Y	N	Y	N	Y	N
Bank FE	Y	Y	Y	Y	Y	Y

Robust standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

8.6 Implication 4: Interaction of competition (M&A) with customer captivity

Customer-base "sleepiness": core deposit and passthrough. A central prediction of the search-based framework is that a more captive depositor base should allow banks to adjust deposit rates less when market rates move (lower betas), more so when the competition becomes less intense, through for example, M&A. Tables 9 and 10 implement this test by interacting market-rate changes with log core deposit upon M&A. In particular, we construct three measures of core deposit: cd1 is the insured deposits (RCON2702), i.e., domestic deposit minus uninsured deposits. cd2 is the sum of demand deposit, total saving deposit and time deposit of 250K or less.

The interaction coefficients `dfedtar_ma_logcd` are positive and statistically significant for 12-month CDs and savings in the specifications shown, indicating that banks with larger core-deposit bases exhibit *greater* spread passthrough (higher ψ) and therefore *lower* deposit

betas upon M&A. In other words, "sleepier" banks (as proxied by a larger core-deposit base) are less compelled to reprice deposits in response to market-rate movements, especially during times of higher market power upon M&A.

The analogous interaction effects are weaker for money market accounts in these specifications, which aligns with the broader pattern above: products closer to cash management/transaction services display different pricing dynamics and may be disciplined by a different margin than relationship-style core deposit measures capture.

Table 9: Deposit beta to fed funds rate × log_cd1 upon M&A

	(1) 12 Mo CD	(2) 12 Mo CD	(3) MM	(4) MM	(5) Savings	(6) Savings
dummy_ma	0.00161	0.00219	0.000462	0.000413	0.000129	0.000262
	(0.00287)	(0.00289)	(0.00157)	(0.00156)	(0.000752)	(0.000760)
log_cd1	0.00569	0.00453	0.000431	0.000520	0.00259*	0.00234*
	(0.00406)	(0.00408)	(0.00265)	(0.00264)	(0.00136)	(0.00137)
dfed_ma	0.0289	-0.548***	0.00375	0.236	0.00154	-0.0919**
	(0.0247)	(0.200)	(0.0142)	(0.211)	(0.00487)	(0.0375)
dfed_logcd1	0.0260***		-0.00219		0.00487***	
	(0.00504)		(0.00298)		(0.00118)	
dfed_ma_logcd1		0.0434***		-0.0172		0.00705***
		(0.0142)		(0.0158)		(0.00254)
Constant	-0.0695	-0.0539	-0.000472	-0.00168	-0.0277	-0.0244
	(0.0520)	(0.0523)	(0.0339)	(0.0338)	(0.0174)	(0.0175)
Observations	28,085	28,085	27,033	27,033	26,302	26,302
R-squared	0.765	0.764	0.941	0.941	0.982	0.982
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

Robust standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 10: Deposit beta to fed funds rate × log_cd2 upon M&A

	(1) 12 Mo CD	(2) 12 Mo CD	(3) MM	(4) MM	(5) Savings	(6) Savings
dummy_ma	0.00196	0.00173	0.000155	0.000188	0.000370	0.000287
	(0.00301)	(0.00302)	(0.00178)	(0.00177)	(0.000830)	(0.000836)
log_cd2	0.00692**	0.00727**	0.00115	0.00113	0.00268**	0.00279**
	(0.00329)	(0.00331)	(0.00222)	(0.00222)	(0.00135)	(0.00135)
dfed_ma	0.0186	-0.399***	0.00230	-0.0875	-0.00342	-0.0708
	(0.0280)	(0.153)	(0.0157)	(0.131)	(0.00661)	(0.0460)
dfed_logcd2	0.0187***		-0.00144		0.00523***	
	(0.00593)		(0.00325)		(0.00142)	
dfed_ma_logcd2		0.0305***		0.00630		0.00504*
		(0.0105)		(0.00902)		(0.00303)
Constant	-0.0707	-0.0661	0.0221	0.0217	0.000655	0.00181
	(0.0435)	(0.0436)	(0.0294)	(0.0292)	(0.0178)	(0.0178)
Observations	25,470	25,470	24,540	24,540	23,887	23,887
R-squared	0.623	0.623	0.890	0.890	0.966	0.966
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

Robust standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Complementary captivity/ rate-sensitivity measure: uninsured deposit share. Finally, we test whether customer-base sensitivity to market rates attenuates banks' ability to keep deposit rates rigid. Tables 11 and 12 show regression results taking into consideration the uninsured-deposit share in total domestic deposit and the size of the uninsured deposit as proxies for a more rate-sensitive depositor base. The interaction `dfed×largedep_share` is negative and statistically significant for 12-month CDs and savings accounts, while significantly positive for `dfed×log_cd`; similar results hold when we use `dfed×log_uninsured` instead. A negative interaction implies lower spread passthrough (smaller ψ) and therefore higher deposit betas: banks funded more heavily by uninsured/large balances are forced to move deposit rates more with the market, consistent with more active search and lower effective deposit market power. The effect is smaller and less precisely estimated for money market accounts, since the supply is much more elastic compared to savings or CD accounts. We also see that upon M&A, higher uninsured deposit also decreases the spread passthrough (thus increasing the deposit beta), although the result is less significant.

Table 11: Large deposit share

	12 Mo CD		MM		Savings	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
log_cd	0.00698**	0.00578	0.00211	0.00254	0.00318**	0.00312**
	(0.00354)	(0.00370)	(0.00224)	(0.00231)	(0.00135)	(0.00138)
largedep_share	-0.00617	-0.00437	0.00575	0.00703	-0.000716	0.000283
	(0.0165)	(0.0166)	(0.0114)	(0.0114)	(0.00548)	(0.00546)
dummy_ma		0.00178		0.000153		0.000150
		(0.00287)		(0.00155)		(0.000752)
dfed × log_cd	0.0314***		-0.000112		0.00682***	
	(0.00578)		(0.00348)		(0.00179)	
dfed × largedep_share	-0.149**		-0.0438		-0.0498*	
	(0.0726)		(0.0417)		(0.0300)	
dfed × dummy_ma		-0.571***		0.231		-0.0932**
		(0.194)		(0.209)		(0.0371)
dfed × dummy_ma × log_cd		0.0499***		-0.0161		0.00755**
		(0.0154)		(0.0150)		(0.00308)
dfed × dummy_ma × largedep_share		-0.222		-0.00468		-0.0225
		(0.206)		(0.155)		(0.0437)
Constant	-0.0865*	-0.0703	-0.0247	-0.0309	-0.0362**	-0.0355*
	(0.0454)	(0.0475)	(0.0282)	(0.0291)	(0.0177)	(0.0181)
Observations	28,052	28,052	27,000	27,000	26,269	26,269
R-squared	0.765	0.764	0.941	0.941	0.982	0.982
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

Table 12: Uninsured deposit

	12 Mo CD		MM		Savings	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
log_cd	0.0120**	0.0102*	0.00363	0.00418	0.00373**	0.00357*
	(0.00529)	(0.00542)	(0.00364)	(0.00367)	(0.00185)	(0.00186)
log_uninsured	-0.00531	-0.00444	-0.00143	-0.00139	-0.000647	-0.000428
	(0.00380)	(0.00378)	(0.00263)	(0.00267)	(0.00136)	(0.00135)
dummy_ma		0.00159		8.76e-05		0.000125
		(0.00287)		(0.00155)		(0.000751)
dfed × log_cd	0.0969***		0.0218		0.0304***	
	(0.0270)		(0.0154)		(0.0106)	
dfed × log_uninsured	-0.0642***		-0.0213		-0.0229**	
	(0.0235)		(0.0131)		(0.00932)	
dfed × dummy_ma		-0.812***		0.238		-0.117**
		(0.251)		(0.228)		(0.0528)
dfed × dummy_ma × log_cd		0.175**		-0.0197		0.0197
		(0.0777)		(0.0582)		(0.0162)
dfed × dummy_ma × log_uninsured		-0.122*		0.00313		-0.0118
		(0.0698)		(0.0535)		(0.0142)
Constant	-0.0912**	-0.0758	-0.0257	-0.0332	-0.0360**	-0.0362**
	(0.0460)	(0.0478)	(0.0290)	(0.0295)	(0.0177)	(0.0181)
Observations	28,052	28,052	27,000	27,000	26,269	26,269
R-squared	0.766	0.764	0.941	0.941	0.982	0.982
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

9 Conclusion

Deposit rates are a central liability-side margin through which bank market power affects households and shapes the transmission of monetary policy. This paper develops and tests a search-based mechanism for deposit market power in which deposit-rate passthrough is jointly determined by depositor inertia and local competition. In the model, a fraction of depositors remain in ongoing relationships each period, summarized by a relationship survival probability λ, while the remaining depositors search and match with banks. Banks set deposit rates taking into account that raising rates attracts marginal searchers but also reduces margins on the inframarginal relationship base. This structure delivers sharp comparative statics: deposit betas rise with competition (a higher effective number of competitors M) and fall with depositor inertia (a higher λ); consolidation reduces offered rates and passthrough, with larger effects when the depositor base is more captive.

The empirical evidence is consistent with these predictions. Using posted retail deposit rates, balance-sheet measures, and merger completion, we document that merger completion is associated with a discrete increase in core deposit and a repricing of offered deposit rates. We then show that spread passthrough increases around merger completion, implying lower deposit betas after consolidation, and that passthrough dynamics shift for non-merging banks in regions experiencing M&A activity. These patterns indicate that local competitive conditions affect not only deposit-rate levels but also the responsiveness of deposit pricing

to benchmark-rate movements. We also find heterogeneity consistent with the mechanism: proxies for depositor attention are associated with higher deposit betas in rate-sensitive products, while proxies for customer-base captivity are associated with lower betas.

Two limitations are important for interpretation. First, measures of depositor attention such as complaints are imperfect proxies for search intensity and may reflect non-price attributes; accordingly, we interpret these results as evidence consistent with the model rather than as causal effects of complaints. Second, merger-based designs identify discrete shifts in local competition but do not, by themselves, fully pin down the mapping from market structure to conduct. An important direction for future work is to integrate richer measures of local market structure and bank conduct with the model's sufficient statistics, and to further quantify the welfare and policy implications of changes in depositor search frictions and deposit-market competition.

References

Adams, P., Hunt, S., Palmer, C., and Zaliauskas, R. (2021). Testing the effectiveness of consumer financial disclosure: Experimental evidence from savings accounts. *Journal of Financial Economics*, 141(1):122–147.

Begenau, J. and Stafford, E. (2021). Limits to bank deposit market power. Working Paper 22-039, Harvard Business School.

Boyd, J. H. and De Nicolò, G. (2005). The theory of bank risk taking and competition revisited. *The Journal of Finance*, 60(3):1329–1343.

Calomiris, C. W. and Nissim, D. (2007). Activity-based valuation of bank holding companies. Working Paper 12918, National Bureau of Economic Research.

Carletti, E., Leonello, A., and Marquez, R. (2024). Market power in banking. Working Paper Series 2886, European Central Bank.

Claessens, S. and Laeven, L. (2004). What drives bank competition? some international evidence. *Journal of Money, Credit and Banking*, 36(3):563–583.

Drechsler, I., Savov, A., and Schnabl, P. (2017). The deposits channel of monetary policy. *The Quarterly Journal of Economics*, 132(4):1819–1876.

Drechsler, I., Savov, A., and Schnabl, P. (2018). A model of monetary policy and risk premia. *The Journal of Finance*, 73(1):317–373.

Drechsler, I., Savov, A., and Schnabl, P. (2021). Banking on deposits: Maturity transformation without interest rate risk. *The Journal of Finance*, 76(3):1091–1143.

Egan, M., Hortaçsu, A., and Matvos, G. (2017). Deposit competition and financial fragility: Evidence from the u.s. banking sector. *American Economic Review*, 107(1):169–216.

Erel, I., Liebersohn, J., Yannelis, C., and Earnest, S. (2023). Monetary policy transmission through online banks. Working Paper 31380, National Bureau of Economic Research. Revised 2025.

Gabaix, X. and Laibson, D. (2006). Shrouded attributes, consumer myopia, and information suppression in competitive markets. *The Quarterly Journal of Economics*, 121(2):505–540.

Hannan, T. H. (2008). Consumer switching costs and firm pricing: Evidence from bank pricing of deposit accounts. Finance and Economics Discussion Series 2008-32, Board of Governors of the Federal Reserve System.

Hellmann, T. F., Murdock, K. C., and Stiglitz, J. E. (2000). Liberalization, moral hazard in banking, and prudential regulation: Are capital requirements enough? *American Economic Review*, 90(1):147–165.

Jiang, E. X., Yu, Y., and Zhang, X. (2024). Bank competition amid digital disruption: Implications for financial inclusion. *Journal of Finance*. Forthcoming.

Keeley, M. C. (1990). Deposit insurance, risk, and market power in banking. *American Economic Review*, 80(5):1183–1200.

Kiser, E. K. (2003). Modeling the whole firm: The effect of multiple inputs and outputs on bank deposit rates. Working paper.

Kishan, R. P., Showalter, D., and Opiela, T. P. (2021). Internet access and bank deposit rates. *Atlantic Economic Journal*, 49(4):405–421.

Li, L. (2023a). Deposit market power, funding stability and long-term credit. *Journal of Monetary Economics*.

Li, Z. (2023b). Deposit market power and bank risk-taking. Working paper.

Sun, L. and Abraham, S. (2021). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, 225(2):175–199.

Van Leuvensteijn, M., Bikker, J. A., van Rixtel, A. A. R. J. M., and Sørensen, C. K. (2007). A new approach to measuring competition in the loan markets of the euro area. Working Paper Series 768, European Central Bank.

World Bank (2016). Banking competition (global financial development report 2016 background note). World Bank background note.

A Mathematical Proof

Proof for Lemma 1. The Bellman equation for the household family

$$V_t\left(\boldsymbol{H}_t, S_t; R_t^d, R_t^0\right) = \max_{C_t, S_{t+1}, h_{it}, N_t} \ln\left(C_t\right) - \Psi\frac{N_t^{1+\phi}}{1+\phi} + \beta V_{t+1}\left(\left\{e(\theta_{it})h_{it} + \lambda H_{it}\right\}_{i=1,\ldots,M}, S_{t+1}; R_{t+1}^d, R_{t+1}^0\right) \tag{36}$$

subject to

$$C_t + S_{t+1} \leq \left[\sum_i H_{it}R_{it}^d + R_t^0(1 - \sum_i H_{it})\right] S_t + W_t N_t + T_t \tag{37}$$

$$\sum_{i=1}^{M} h_{it} + \lambda \sum_{i=1}^{M} H_{it} = 1 \tag{38}$$

The Lagrangian function then becomes

$$\begin{aligned}\mathcal{L} = &\ln C_t - \Psi\frac{N_t^{1+\phi}}{1+\phi} + \beta V_{t+1}\left(\left\{e(\theta_{it})h_{it} + \lambda H_{it}\right\}_{i=1,\ldots,M}, S_{t+1}; R_{t+1}^d, R_{t+1}^0\right) \\ &+ \mu_t\left\{\left[\sum_i R_{it}^d H_{it} + R_t^0(1 - \sum_i H_{it})\right] S_t + W_t N_t + T_t - C_t - S_{t+1}\right\} \\ &+ \nu_t(1 - \lambda\sum_i H_{it} - \sum_i h_{it})\end{aligned}$$

We derive the first-order conditions:

$$h_{it} : \beta\frac{\partial V_{t+1}(\boldsymbol{H}_{t+1}, S_{t+1})}{\partial H_{it+1}} e(\theta_{it}) = \nu_t \tag{39}$$

$$C_t : \frac{1}{C_t} = \mu_t \tag{40}$$

$$S_{t+1} : \beta\frac{\partial V_{t+1}(\boldsymbol{H}_{t+1}, S_{t+1})}{\partial S_{t+1}} = \frac{1}{C_t} \tag{41}$$

$$N_t : \Psi N_t^{\phi} = \frac{W_t}{C_t} \tag{42}$$

Envelope theorem:

$$\begin{aligned}\frac{\partial V_t(\boldsymbol{H}_t, S_t)}{\partial H_{it}} &= \beta\lambda\frac{\partial V_{t+1}(\boldsymbol{H}_{t+1}, S_{t+1})}{\partial H_{it+1}} + \frac{S_t}{C_t}(R_{it}^d - R_t^0) - \lambda\nu_t \\ &= \frac{S_t}{C_t}(R_{it}^d - R_t^0) + \beta\lambda\left[1 - e(\theta_{it})\right]\frac{\partial V_{t+1}(\boldsymbol{H}_{t+1}, S_{t+1})}{\partial H_{it+1}} \\ &= \frac{S_t}{C_t}(R_{it}^d - R_t^0) + \beta\lambda\left[1 - e(\theta_{it})\right]\left\{\frac{S_{t+1}}{C_{t+1}}(R_{it+1}^d - R_{t+1}^0) + \beta\lambda\left[1 - e(\theta_{it+1})\right]\frac{\partial V_{t+2}(\boldsymbol{H}_{t+2}, S_{t+2})}{\partial H_{it+2}}\right\} \\ &= \frac{S_t}{C_t}\left(R_{it}^d - R_t^0\right) + \sum_{s=1}^{\infty}\left(\beta\lambda\right)^s \Pi_{\tau=1}^{s}\left[1 - e(\theta_{it+\tau-1})\right]\frac{S_{t+s}}{C_{t+s}}\left(R_{it+s}^d - R_{t+s}^0\right)\end{aligned} \tag{43}$$

$$\frac{\partial V_t(\boldsymbol{H}_t, S_t)}{\partial S_t} = \frac{1}{C_t}\left[\sum_i R_{it}^d H_{it} + R_t^0(1 - \sum_i H_{it})\right] \tag{44}$$

Equation (43) directly proves Lemma 1. ■

Proof for Lemma 2. Define the continuation value from maintaining an incumbent relationship with bank i beyond $t+1$ as

$$U_{it+1} \equiv \sum_{s=1}^{\infty} (\beta\lambda)^s \, \Pi_{\tau=1}^{s} \left[1 - e(\theta_{i,t+\tau})\right] \frac{S_{t+1+s}}{C_{t+1+s}} \left(R_{i,t+1+s}^{d} - R_{t+1+s}^{0}\right).$$

By Lemma 1,

$$\frac{\partial V_{t+1}(\boldsymbol{H}_{t+1}, S_{t+1})}{\partial H_{i,t+1}} = \frac{S_{t+1}}{C_{t+1}}(R_{i,t+1}^{d} - R_{t+1}^{0}) + U_{i,t+1}.$$

The household indifference condition for searching different banks implies

$$e(\theta_{it})\frac{\partial V_{t+1}}{\partial H_{i,t+1}} = e(\theta_{kt})\frac{\partial V_{t+1}}{\partial H_{k,t+1}}, \qquad \forall k \neq i.$$

FOC with b_{it}:

$$\begin{aligned} &\frac{S_{t+1}}{C_{t+1}}(R_{it+1}^{d} - R_{t+1}^{0}) + U_{it+1}e'\left(\frac{b_{it}}{h_{it}}\right)\left[\frac{1}{h_{it}} + \frac{\theta_{it}}{h_{it}}\sum_{s\neq i}\frac{\partial h_{st}}{\partial b_{it}}\right] \\ =& -\frac{S_{t+1}}{C_{t+1}}(R_{kt+1}^{d} - R_{t+1}^{0}) + U_{kt+1}e'\left(\frac{b_{kt}}{h_{kt}}\right)\frac{\theta_{kt}}{h_{kt}}\frac{\partial h_{kt}}{\partial b_{it}} \end{aligned} \tag{45}$$

FOC with R_{it+1}^{d}:

$$\begin{aligned} &e\left(\frac{b_{it}}{h_{it}}\right)\frac{S_{t+1}}{C_{t+1}} + \left[\frac{S_{t+1}}{C_{t+1}}(R_{it+1}^{d} - R_{t+1}^{0}) + U_{it+1}\right]e'\left(\frac{b_{it}}{h_{it}}\right)\frac{\theta_{it}}{h_{it}}\sum_{s\neq i}\frac{\partial h_{st}}{\partial R_{it+1}^{d}} \\ =& -\left[\frac{S_{t+1}}{C_{t+1}}(R_{kt+1}^{d} - R_{t+1}^{0}) + U_{kt+1}\right]e'\left(\frac{b_{kt}}{h_{kt}}\right)\frac{\theta_{kt}}{h_{kt}}\frac{\partial h_{kt}}{\partial R_{it+1}^{d}} \end{aligned} \tag{46}$$

In the symmetric equilibrium, $h_{it} = h_{kt} = h_t = \frac{1-\lambda M H_t}{M}$, $b_{it} = b_{kt} = b_t$, $H_{it} = H_{kt} = H_t$, and $R_{it+1}^{d} = R_{kt+1}^{d} = R_{t+1}^{d}$. Equation (45) becomes

$$\begin{aligned} e'\left(\frac{b_t}{h_t}\right)\left[\frac{1}{h_{it}} + \frac{\theta_{it}}{h_{it}}M\frac{\partial h_t}{\partial b_{it}}\right] &= 0 \\ 1 + \theta_t M\frac{\partial h_t}{\partial b_{it}} &= 0 \\ \frac{\partial h_t}{\partial b_{it}} &= -\frac{1}{M\theta_t} \end{aligned} \tag{47}$$

Since $h_{it} = 1 - \lambda M H_t - (M-1)\, h_t$,

$$\frac{\partial h_t}{\partial b_t} = \frac{\partial h_{it}}{\partial b_{it}} = \frac{M-1}{M\theta_t} \tag{48}$$

Similarly, Equation (46) becomes

$$0 = e\left(\frac{b_{it}}{h_{it}}\right)\frac{S_{t+1}}{C_{t+1}} + \left[\frac{S_{t+1}}{C_{t+1}}(R^d_{it+1} - R^0_{t+1}) + U_{t+1}\right] e'\left(\frac{b_{it}}{h_{it}}\right)\frac{\theta_{it}}{h_{it}} M \frac{\partial h_t}{\partial R^d_{it+1}}$$

$$0 = e\left(\frac{b_{it}}{h_{it}}\right)\frac{S_{t+1}}{C_{t+1}} + \left[\frac{S_{t+1}}{C_{t+1}}(R^d_{it+1} - R^0_{t+1}) + U_{t+1}\right] e'\left(\frac{b_{it}}{h_{it}}\right)\frac{\theta_{it}}{h_{it}} M \frac{\partial h_t}{\partial R^d_{it+1}}$$

$$\begin{aligned}\frac{\partial h_t}{\partial R^d_{it+1}} &= -\frac{e\left(\frac{b_{it}}{h_{it}}\right)\frac{S_{t+1}}{C_{t+1}}}{\left[\frac{S_{t+1}}{C_{t+1}}(R^d_{it+1} - R^0_{t+1}) + U_{t+1}\right] e'\left(\frac{b_{it}}{h_{it}}\right)\frac{\theta_{it}}{h_{it}} M} \\ &= -\frac{e\left(\theta_{it}\right)\left(1-\lambda M H_t\right)}{\theta_{it} e'\left(\theta_{it}\right) M^2}\frac{\frac{S_{t+1}}{C_{t+1}}}{\frac{S_{t+1}}{C_{t+1}}(R^d_{it+1} - R^0_{t+1}) + U_{t+1}} \\ &= -\frac{1-\lambda M H_t}{\varepsilon M^2}\frac{\frac{S_{t+1}}{C_{t+1}}}{\frac{S_{t+1}}{C_{t+1}}(R^d_{it+1} - R^0_{t+1}) + U_{t+1}}\end{aligned} \tag{49}$$

Since $h_{it} = 1 - \lambda M H_t - (M-1)\, h_t$,

$$\frac{\partial h_t}{\partial R^d_{t+1}} = \frac{\partial h_{it}}{\partial R^d_{it+1}} = \frac{\left(1-\lambda M H_t\right)(M-1)}{\varepsilon M^2}\frac{\frac{S_{t+1}}{C_{t+1}}}{\frac{S_{t+1}}{C_{t+1}}(R^d_{t+1} - R^0_{t+1}) + U_{t+1}} \tag{50}$$

■

Proof for Lemma 3. Bank i's Lagrangian function is

$$\mathcal{L}_{bt} = \max_{b_{it}, R^d_{it+1}} \left(R_t - R^d_{it}\right) H_{it} S_t - W_t b_{it} + \beta \frac{C_t}{C_{t+1}} J_{it+1}\left(\lambda H_{it} + e(\theta_{it}) h_{it}, R^d_{it+1}\right) \tag{51}$$

The envelope theorem implies that

$$\frac{\partial J_{it}\left(H_{it}, R^d_{it}\right)}{\partial H_{it}} = \left(R_t - R^d_{it}\right) S_t + \beta\lambda \frac{C_t}{C_{t+1}} \frac{\partial J_{it+1}\left(H_{it+1}, R^d_{it+1}\right)}{\partial H_{it+1}} \tag{52}$$

$$\frac{\partial J_{it}\left(H_{it}, R^d_{it}\right)}{\partial R^d_{it}} = -H_{it} S_t \tag{53}$$

Therefore the value of deposit relationship to bank i is

$$\begin{aligned}\frac{\partial J_{it}\left(H_{it}, R^d_{it}\right)}{\partial H_{it}} &= \left(R_t - R^d_{it}\right) S_t + \beta\lambda \frac{C_t}{C_{t+1}} \frac{\partial J_{it+1}\left(H_{it+1}, R^d_{it+1}\right)}{\partial H_{it+1}} \\ &= \left(R_t - R^d_{it}\right) S_t + \beta\lambda \frac{C_t}{C_{t+1}}\left[\left(R_{t+1} - R^d_{it+1}\right) S_{t+1} + \beta\lambda \frac{C_{t+1}}{C_{t+2}} \frac{\partial J_{it+2}\left(H_{it+2}, R^d_{it+2}\right)}{\partial H_{it+2}}\right] \\ &= \left(R_t - R^d_{it}\right) S_t + \sum_{s=1}^{\infty} (\beta\lambda)^s \frac{C_t}{C_{t+s}}\left(R_{t+s} - R^d_{it+s}\right) S_{t+s} \\ &= \sum_{s=0}^{\infty} (\beta\lambda)^s \frac{C_t}{C_{t+s}}\left(R_{t+s} - R^d_{it+s}\right) S_{t+s}\end{aligned} \tag{54}$$

■

Proof for Lemma 4. Banks' first-order conditions with respect to b_{it} and R^d_{it+1} yield

$$\begin{aligned} -W_t + \beta\frac{C_t}{C_{t+1}}\frac{\partial J_{it+1}\left(H_{it+1}, R^d_{it+1}\right)}{\partial H_{it+1}}\left(e'(\theta_{it})h_{it}\left(\frac{1}{h_{it}} - \frac{b_{it}}{h^2_{it}}\frac{\partial h_{it}}{\partial b_{it}}\right) + e(\theta_{it})\frac{\partial h_{it}}{\partial b_{it}}\right) = 0 \\ \beta\frac{C_t}{C_{t+1}}\frac{\partial J_{it+1}\left(H_{it+1}, R^d_{it+1}\right)}{\partial H_{it+1}}\left(e'(\theta_{it})\left(1 - \theta_{it}\frac{\partial h_{it}}{\partial b_{it}}\right) + e(\theta_{it})\frac{\partial h_{it}}{\partial b_{it}}\right) = W_t \end{aligned} \tag{55}$$

$$\begin{aligned} \beta\frac{C_t}{C_{t+1}}\frac{\partial J_{it+1}\left(H_{it+1}, R^d_{it+1}\right)}{\partial H_{it+1}}\left(e'(\theta_{it})h_{it}\left(-\frac{b_{it}}{h^2_{it}}\frac{\partial h_{it}}{\partial R^d_{it+1}}\right) + e(\theta_{it})\frac{\partial h_{it}}{\partial R^d_{it+1}}\right) + \beta\frac{C_t}{C_{t+1}}\frac{\partial J_{it+1}\left(H_{it+1}, R^d_{it+1}\right)}{\partial R^d_{it+1}} = 0 \\ \beta\frac{C_t}{C_{t+1}}\frac{\partial J_{it+1}\left(H_{it+1}, R^d_{it+1}\right)}{\partial H_{it+1}}\left(e(\theta_{it}) - e'(\theta_{it})\theta_{it}\right)\frac{\partial h_{it}}{\partial R^d_{it+1}} + \beta\frac{C_t}{C_{t+1}}\frac{\partial J_{it+1}\left(H_{it+1}, R^d_{it+1}\right)}{\partial R^d_{it+1}} = 0 \\ \beta\frac{C_t}{C_{t+1}}\frac{\partial J_{it+1}\left(H_{it+1}, R^d_{it+1}\right)}{\partial H_{it+1}}e(\theta_{it})\left(1-\varepsilon\right)\frac{\partial h_{it}}{\partial R^d_{it+1}} + \beta\frac{C_t}{C_{t+1}}\frac{\partial J_{it+1}\left(H_{it+1}, R^d_{it+1}\right)}{\partial R^d_{it+1}} = 0 \end{aligned} \tag{56}$$

In the symmetric equilibrium, banks make the same decision on deposit rates and recruitment. Neglecting the bank index i of Equations (55) and (56) gives Lemma 4 ■

Proof for Proposition 1. In the steady state, the law of motion for depositor relationship becomes

$$\begin{aligned} H(1-\lambda) &= e(\theta)h \\ H &= \frac{e(\theta)h}{1-\lambda} \end{aligned} \tag{57}$$

The aggregate adding-up constraint is

$$\begin{aligned} Mh + \lambda M\frac{e(\theta)h}{1-\lambda} &= 1 \\ h &= \frac{1}{M + \lambda M\frac{e(\theta)}{1-\lambda}} \end{aligned} \tag{58}$$

Therefore

$$\begin{aligned} H = \frac{e(\theta)h}{1-\lambda} &= \frac{e(\theta)}{M\left(1-\lambda\right) + \lambda M e(\theta)} \\ MH &= \frac{e(\theta)}{(1-\lambda) + \lambda e(\theta)} \end{aligned} \tag{59}$$

By definition of U, we have

$$U = \frac{S}{C}(R^d - R^0)\frac{\beta\lambda\left[1 - e(\theta)\right]}{1 - \beta\lambda\left[1 - e(\theta)\right]} \tag{60}$$

The optimal deposit rate then follows

$$
\begin{aligned}
e(\theta)\frac{(1-\lambda MH)(M-1)(1-\varepsilon)}{\varepsilon M^2}\frac{1}{1+\frac{\beta\lambda[1-e(\theta)]}{1-\beta\lambda[1-e(\theta)]}}\frac{1}{1-\beta\lambda}\frac{R-R^d}{R^d-R^0} &= \lambda H + e(\theta)h \\
e(\theta)\frac{(1-\lambda MH)(M-1)(1-\varepsilon)}{\varepsilon M^2}\frac{1-\beta\lambda[1-e(\theta)]}{1-\beta\lambda}\frac{R-R^d}{R^d-R^0} &= \lambda H + e(\theta)h \\
\frac{h(M-1)(1-\varepsilon)}{\varepsilon M}\frac{1-\beta\lambda[1-e(\theta)]}{1-\beta\lambda}\frac{R-R^d}{R^d-R^0} &= \frac{1}{M(1-\lambda)+\lambda M e(\theta)} \\
\frac{1-\lambda}{(1-\lambda)M+\lambda M e(\theta)}\frac{(M-1)(1-\varepsilon)}{\varepsilon M}\frac{1-\beta\lambda[1-e(\theta)]}{1-\beta\lambda}\frac{R-R^d}{R^d-R^0} &= \frac{1}{M(1-\lambda)+\lambda M e(\theta)} \\
\frac{(M-1)(1-\varepsilon)}{\varepsilon M}\frac{(1-\lambda)\{1-\beta\lambda[1-e(\theta)]\}}{1-\beta\lambda}\frac{R-R^d}{R^d-R^0} &= 1
\end{aligned}
\tag{61}
$$

Denote the effective survival rate of deposit relationship

$$
L(\theta;\lambda) = 1 - \frac{(1-\lambda)\{1-\beta\lambda[1-e(\theta)]\}}{1-\beta\lambda} > 0
$$

Therefore

$$
\begin{aligned}
\frac{(M-1)(1-\varepsilon)[1-L(\theta;\lambda)]}{\varepsilon M}\frac{R-R^d}{R^d-R^0} &= 1 \\
(M-1)(1-\varepsilon)[1-L(\theta;\lambda)]\left(R-R^d\right) &= \varepsilon M\left(R^d-R^0\right) \\
R^d &= \frac{(M-1)(1-\varepsilon)[1-L(\theta;\lambda)]R+\varepsilon M R^0}{(M-1)(1-\varepsilon)[1-L(\theta;\lambda)]+\varepsilon M} \\
R^d &= \omega R + (1-\omega)R^0
\end{aligned}
\tag{62}
$$

where $\omega = \frac{(M-1)(1-\varepsilon)[1-L(\theta;\lambda)]}{(M-1)(1-\varepsilon)[1-L(\theta;\lambda)]+\varepsilon M}$. ■

Proof for Proposition 2. For any given λ and θ,

$$
\begin{aligned}
\frac{\partial(1-\omega)}{\partial M} &= \frac{\varepsilon[(M-1)(1-\varepsilon)[1-L(\theta;\lambda)]+\varepsilon M]-\varepsilon M[(1-\varepsilon)[1-L(\theta;\lambda)]+\varepsilon]}{[(M-1)(1-\varepsilon)[1-L(\theta;\lambda)]+\varepsilon M]^2} \\
&= \frac{-\varepsilon(1-\varepsilon)[1-L(\theta;\lambda)]}{[(M-1)(1-\varepsilon)[1-L(\theta;\lambda)]+\varepsilon M]^2} < 0
\end{aligned}
\tag{63}
$$

Therefore,

$$
\frac{\partial R^d}{\partial M} > 0, \quad \frac{\partial^2 R^d}{\partial M \partial R} > 0 \tag{64}
$$

■

Proof for Proposition 3. For any given M and θ, we obtain that

$$
\frac{\partial(1-\omega)}{\partial L(\theta;\lambda)} = \frac{\varepsilon M(M-1)(1-\varepsilon)}{[(M-1)(1-\varepsilon)[1-L(\theta;\lambda)]+\varepsilon M]^2} > 0 \tag{65}
$$

$$
\frac{\partial(1-L(\theta;\lambda))}{\partial\lambda} = \frac{\beta e(\theta)(1-2\lambda+\beta\lambda^2)-(1-\beta\lambda)^2}{(1-\beta\lambda)^2} < 0, \tag{66}
$$

The inequality uses $e(\theta) \leq 1$: the numerator is at most $\beta\left(1-2\lambda+\beta\lambda^2\right)-(1-\beta\lambda)^2 = \beta - 1 < 0$. Therefore $\frac{\partial L(\theta;\lambda)}{\partial \lambda} > 0$. Therefore,

$$\frac{\partial R^d}{\partial \lambda} < 0, \quad \frac{\partial^2 R^d}{\partial R \partial \lambda} < 0 \tag{67}$$

■

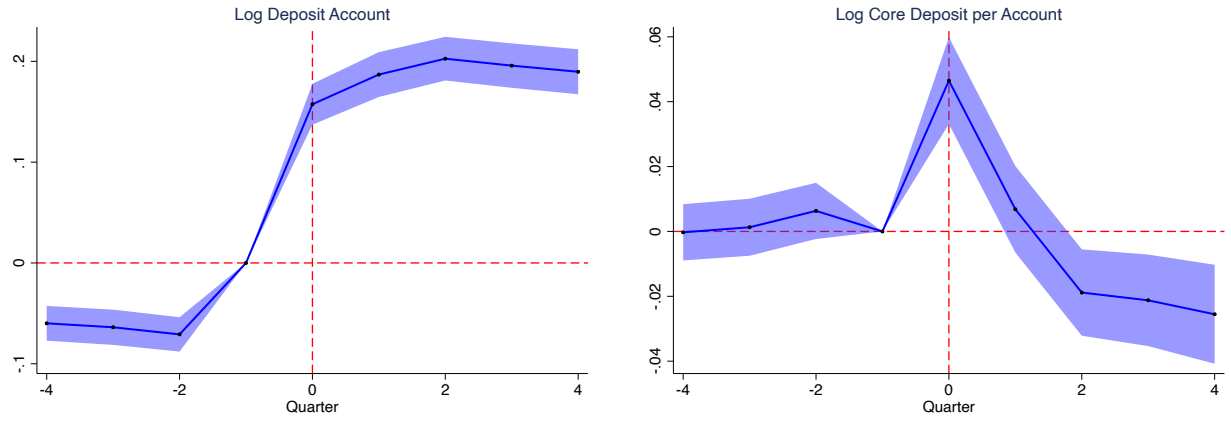
B Empirical Appendix

This appendix reports supplemental evidence and robustness checks. The unifying goal is to clarify whether the paper's main mechanism—the interaction of local competition and a captive depositor base—shows up consistently across (i) alternative estimators, (ii) product definitions (minimum balance and maturity), and (iii) broader samples.

B.1 Additional empirics on M&A

Core deposits per account: extensive vs. intensive margins

The main text documents that core deposits jump around merger completion. Figure A1 decomposes this adjustment into (i) changes in the number of deposit accounts (an extensive margin) and (ii) changes in core deposits per account (an intensive margin).



(a) (b)

Figure A1: Core deposit per account

Figure A1 indicates that the post-merger increase in relationship funding is driven primarily by the consolidation of customer relationships (accounts) at completion. Panel (a) shows a discrete increase in log accounts at $t = 0$ that remains elevated, consistent with the mechanical aggregation of predecessor relationships into the successor. Panel (b) shows that core deposits per account rise at completion but then mean-revert: the initial increase is consistent with combining balance sheets, while the subsequent drift suggests normalization

(e.g., integration-related runoff or reallocation of balances). Taken together, the figure supports the interpretation that M&A increases the *stock of relationships* that banks can price against, which is the relevant object in the model for deposit market power.

Table A1: Demean dfed and log core deposit for Table 9

	12 Mo CD		MM		Savings	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
dummy_ma	0.00170	0.00230	0.000474	0.000430	0.000134	0.000271
	(0.00285)	(0.00287)	(0.00154)	(0.00154)	(0.000748)	(0.000756)
dm_logcd1	0.00577	0.00453	0.000424	0.000523	0.00260*	0.00234*
	(0.00406)	(0.00408)	(0.00265)	(0.00264)	(0.00136)	(0.00137)
dm_dfed × dummy_ma	0.0289	0.00737	0.00375	0.0165	0.00154	-0.00166
	(0.0247)	(0.0292)	(0.0142)	(0.0162)	(0.00487)	(0.00627)
dm_dfed × dm_logcd1	0.0260***		-0.00219		0.00487***	
	(0.00504)		(0.00298)		(0.00118)	
dm_dfed × dummy_ma × dm_logcd1		0.0433***		-0.0172		0.00705***
		(0.0142)		(0.0158)		(0.00255)
Constant	0.00454***	0.00422***	0.00495***	0.00498***	0.00569***	0.00561***
	(0.000169)	(0.000161)	(9.36e-05)	(8.90e-05)	(4.53e-05)	(4.34e-05)
Observations	28,085	28,085	27,033	27,033	26,302	26,302
R-squared	0.765	0.764	0.941	0.941	0.982	0.982
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

Robustness: de-meaning market-rate changes and core deposits

Tables below re-estimate the core-deposit heterogeneity specifications after de-meaning the market-rate change and core-deposit measure (relative to the relevant fixed effects). This demean exercise recovers positive signs of the coefficient of dummy_ma, so that M&A activity alone shows a positive impact on deposit spread, as well as the coefficient of the interaction between dummy_ma and dm_dfed, so that M&A activity also has a positive impact on deposit spread upon fed funds rate increase, essentially reducing deposit beta.

The de-meaned specifications deliver the same qualitative message as the main tables: banks with larger core-deposit bases exhibit *stronger* spread passthrough (lower deposit betas), and this pattern is amplified around M&A completion. Importantly, this remains true when the inputs are constructed net of fixed effects, supporting the interpretation that the results reflect differential *responsiveness* rather than cross-sectional level differences.

Event studies using the interaction-weighted estimator

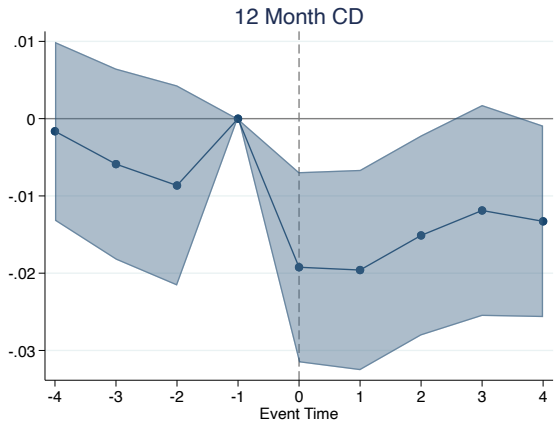
Figure A2 reports merger event studies using the interaction-weighted estimator (Sun and Abraham, 2021). This addresses concerns about bias from two-way fixed effects under staggered treatment timing and heterogeneous effects.

The interaction-weighted event studies corroborate the baseline repricing results: offered rates decline around completion for CDs and money market accounts, while the savings response is smaller and noisier. Pre-event coefficients are generally close to zero, which

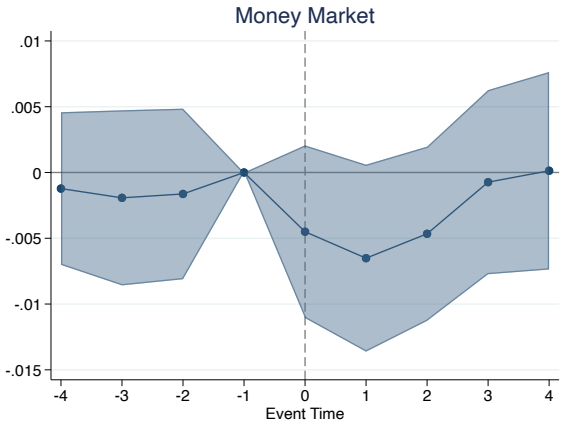
Table A2: Demean dfed and log core deposit for Table 10

	12 Mo CD		MM		Savings	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
dummy_ma	0.00202	0.00180	0.000162	0.000187	0.000359	0.000285
	(0.00297)	(0.00298)	(0.00175)	(0.00174)	(0.000821)	(0.000827)
dm_logcd2	0.00697**	0.00726**	0.00115	0.00113	0.00270**	0.00279**
	(0.00329)	(0.00331)	(0.00222)	(0.00222)	(0.00135)	(0.00135)
dm_dfed × dummy_ma	0.0186	0.00270	0.00230	-0.00461	-0.00342	-0.00442
	(0.0280)	(0.0304)	(0.0157)	(0.0190)	(0.00661)	(0.00825)
dm_dfed × dm_logcd2	0.0187***		-0.00144		0.00523***	
	(0.00593)		(0.00325)		(0.00142)	
dm_dfed × dummy_ma × dm_logcd2		0.0305***		0.00638		0.00507*
		(0.0105)		(0.00911)		(0.00305)
Constant	0.0296***	0.0296***	0.0365***	0.0365***	0.0385***	0.0385***
	(0.000158)	(0.000157)	(8.97e-05)	(8.91e-05)	(4.37e-05)	(4.39e-05)
Observations	25,470	25,470	24,540	24,540	23,887	23,887
R-squared	0.623	0.623	0.890	0.890	0.966	0.966
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

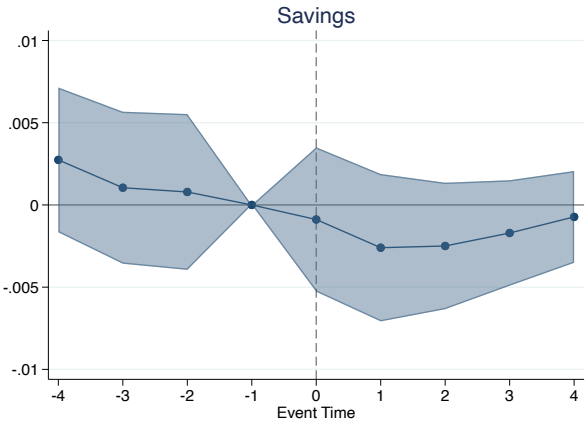
supports the identifying assumption that there are no strong differential pre-trends in pricing prior to completion.



(a) 12-month CD



(b) Money market



(c) Savings

Figure A2: Event-study plots of deposit rates around M&A, interaction-weighted estimator
Notes: The event studies are based on the interaction-weighted estimator of Sun and Abraham (2021). The control cohort consists of all banks except acquirers.

B.2 Heterogeneity across minimum fund requirement and maturity of products

Why minimum-balance and maturity heterogeneity is informative

RateWatch product codes differentiate products by minimum balance requirements and (for CDs) maturity. These dimensions are economically relevant in the model: higher minimum balances and longer maturities tend to attract more rate-sensitive customers, which should discipline banks and raise deposit betas. The tables in this subsection therefore ask whether the merger and "sleepiness" patterns are robust across product definitions and whether they vary in ways consistent with depositor composition.

Table A3: Product frequencies for 12 month CD in 2012, monthly

PRODUCT DESCRIPTION	Freq.	Percent	Cum.
12MCD0K	2,535	0.11	0.11
12MCD100K	118,555	5.20	5.31
12MCD10K	127,797	5.61	10.92
12MCD15K	126,916	5.57	16.49
12MCD1K	104,277	4.58	21.06
12MCD1MIL	114,074	5.01	26.07
12MCD2.5K	111,201	4.88	30.95
12MCD200K	118,141	5.18	36.13
12MCD20K	126,307	5.54	41.67
12MCD250K	115,265	5.06	46.73
12MCD25K	119,719	5.25	51.98
12MCD2K	106,407	4.67	56.65
12MCD35K	119,656	5.25	61.90
12MCD40K	119,541	5.24	67.15
12MCD500	52,881	2.32	69.47
12MCD500K	114,209	5.01	74.48
12MCD50K	116,924	5.13	79.61
12MCD5K	114,317	5.02	84.62
12MCD60K	116,900	5.13	89.75
12MCD75K	116,831	5.13	94.88
12MCD90K	116,737	5.12	100.00
Total	2,279,190	100.00	

Table A4: Product frequencies for money market in 2012, monthly

PRODUCT DESCRIPTION	Freq.	Percent	Cum.
MM0K	3,381	0.14	0.14
MM1.5K	66,215	2.65	2.79
MM100K	88,489	3.55	6.34
MM10K	115,931	4.65	10.98
MM150K	87,556	3.51	14.49
MM15K	114,299	4.58	19.08
MM1K	63,920	2.56	21.64
MM1MILLION	79,191	3.17	24.81
MM2.5K	111,996	4.49	29.30
MM2.5MIL	79,022	3.17	32.47
MM200K	86,905	3.48	35.95
MM20K	114,411	4.59	40.54
MM225K	86,904	3.48	44.03
MM250K	83,302	3.34	47.36
MM25K	116,236	4.66	52.02
MM2K	69,993	2.81	54.83
MM300K	82,985	3.33	58.16
MM30K	115,284	4.62	62.78
MM35K	114,991	4.61	67.39
MM3K	111,584	4.47	71.86
MM40K	114,602	4.59	76.46
MM45K	28,118	1.13	77.58
MM500K	80,514	3.23	80.81
MM50K	91,974	3.69	84.50
MM5K	109,163	4.38	88.87
MM5MIL	78,875	3.16	92.04
MM750K	19,460	0.78	92.82
MM75K	89,647	3.59	96.41
MM90K	89,575	3.59	100.00
Total	2,494,523	100.00	

Table A5: Product frequencies for savings in 2012, monthly

PRODUCT DESCRIPTION	Freq.	Percent	Cum.
SAV0K	4,635	0.24	0.24
SAV100	104,649	5.36	5.60
SAV100K	111,316	5.70	11.30
SAV10K	114,809	5.88	17.18
SAV150K	111,305	5.70	22.88
SAV15K	114,529	5.87	28.75
SAV1K	120,548	6.17	34.92
SAV1MILLION	110,675	5.67	40.59
SAV2.5K	127,688	6.54	47.13
SAV20K	114,229	5.85	52.98
SAV250	111,936	5.73	58.71
SAV25K	112,433	5.76	64.47
SAV2K	121,775	6.24	70.71
SAV500	117,264	6.01	76.72
SAV500K	110,721	5.67	82.39
SAV50K	111,600	5.72	88.10
SAV5K	120,711	6.18	94.29
SAV90K	111,540	5.71	100.00
Total	1,952,363	100.00	

Tables A3–A5 show that the sample is not driven by a single product definition: observations are spread across a range of minimum-balance buckets. This motivates the robustness checks below, which replicate the passthrough patterns across minimum requirements and maturities.

Minimum-balance heterogeneity (M&A). Tables A6–A8 examine whether the core mechanism is present across minimum-balance buckets. The key takeaway is that the qualitative effects are stable: (i) spread passthrough rises in merger windows (implying lower deposit betas), and (ii) the increase in passthrough is larger for banks with higher core deposits (sleepier depositor bases). The effects are strongest for CDs, weaker for money market accounts, and present but smaller for savings—a pattern consistent with product differences in effective elasticity of deposit supply.

Maturity heterogeneity. Tables A9 and A10 extend the analysis across CD maturities and (in the latter) use maturity-related Treasury yields as benchmarks. Two patterns are informative. First, merger effects on passthrough are not confined to 12-month products; they appear across maturities, consistent with a market-structure mechanism rather than a product-specific repricing episode. Second, using maturity-matched market rates provides a benchmark for how longer-term CDs load on longer-term opportunity costs; the persistence of the M&A interaction across benchmarks supports the interpretation that consolidation changes deposit-market power rather than only the mapping between a product and the chosen short-rate benchmark.

Table A6: Minimum fund requirement and Deposit beta across CD products (M&A)

VARIABLES	(1) 12MCD1K	(2) 12MCD10K	(3) 12MCD100K	(4) 12MCD500K	(5) 12MCD1K	(6) 12MCD10K	(7) 12MCD100K	(8) 12MCD500K	(9) 12MCD1K	(10) 12MCD10K	(11) 12MCD100K	(12) 12MCD500K	(13) 12MCD1K	(14) 12MCD10K	(15) 12MCD100K	(16) 12MCD500K	(17) 12MCD1K	(18) 12MCD10K	(19) 12MCD100K	(20) 12MCD500K
dummy_ma	0.00356	0.00178	0.00339	0.00326	0.0032	0.00089	0.00222	0.00237	0.00394	0.00171	0.00298	0.00317	0.00444	0.00191	0.00369	0.00392	0.00555	0.00344	0.00519	0.00541
	-0.00312	-0.00289	-0.00296	-0.003	-0.00309	-0.00288	-0.00295	-0.003	-0.00311	-0.0029	-0.00297	-0.00302	-0.00396	-0.00365	-0.00378	-0.00387	-0.00413	-0.00381	-0.00395	-0.00403
lag_logcd													0.0036	0.00731**	0.00846**	0.00680*	0.00185	0.00524	0.00669*	0.00489
													-0.00394	-0.00361	-0.00383	-0.00399	-0.00395	-0.00368	-0.00389	-0.00404
dlog_cd													-0.00169	0.00272	0.00189	-0.00013	-0.00429	-0.00114	-0.00173	-0.00368
													-0.0102	-0.00939	-0.00991	-0.00998	-0.0104	-0.00963	-0.0102	-0.0102
dfed_ma	0.0365	0.04	0.0417	0.0407	0.0257	0.0273	0.032	0.0291	-0.594**	-0.540***	-0.545***	-0.543***	0.0321	0.0214	0.026	0.0242	-0.652**	-0.627***	-0.644***	-0.636***
	-0.0272	-0.025	-0.0254	-0.0264	-0.0271	-0.0248	-0.0253	-0.0262	-0.235	-0.192	-0.196	-0.204	-0.0344	-0.0311	-0.0316	-0.0324	-0.263	-0.226	-0.231	-0.238
dfed_lag_logcd													0.0221***	0.0253***	0.0207***	0.0220***				
													-0.00514	-0.00458	-0.00517	-0.00506				
dfed_dlogcd													-0.00459	0.0511	0.0472	0.0446				
													-0.0844	-0.0782	-0.0813	-0.0822				
log_cd					0.00332	0.00697*	0.00801**	0.00634	0.00144	0.00482	0.00618	0.00438								
					-0.00386	-0.00356	-0.00379	-0.00391	-0.00385	-0.00362	-0.00383	-0.00394								
dfed_loged					0.0220***	0.0254***	0.0208***	0.0221***												
					-0.00515	-0.00458	-0.00517	-0.00505												
dfed_ma_loged									0.0450***	0.0413***	0.0417***	0.0416***								
									-0.0164	-0.0132	-0.0135	-0.014								
dfed_ma_lag_loged																	0.0480***	0.0457***	0.0468***	0.0463***
																	-0.0174	-0.0146	-0.0149	-0.0154
dfed_ma_dloged																	0.101	0.126	0.139	0.137
																	-0.12	-0.118	-0.125	-0.129
Constant	0.00287***	0.00313***	0.00275***	0.00322***	-0.0405	-0.0884*	-0.102**	-0.0799	-0.0152	-0.0594	-0.0777	-0.0534	-0.0442	-0.0927*	-0.108**	-0.0857	-0.0205	-0.0648	-0.0843	-0.06
	-0.00017	-0.00016	-0.00016	-0.00016	-0.0508	-0.0469	-0.0499	-0.0514	-0.0507	-0.0476	-0.0505	-0.0519	-0.0519	-0.0476	-0.0505	-0.0525	-0.0519	-0.0484	-0.0512	-0.0531
Observations	24012	28577	27832	27148	23593	28039	27306	26645	23593	28039	27306	26645	23593	28039	27306	26645	23593	28039	27306	26645
R-squared	0.766	0.765	0.751	0.755	0.77	0.77	0.755	0.759	0.769	0.768	0.753	0.758	0.77	0.77	0.755	0.759	0.769	0.769	0.754	0.758
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A7: Minimum fund requirement and Deposit beta across MM products (M&A)

VARIABLES	(1) MM1K	(2) MM10K	(3) MM100K	(4) MM500K	(5) MM1K	(6) MM10K	(7) MM100K	(8) MM500K	(9) MM1K	(10) MM10K	(11) MM100K	(12) MM500K	(13) MM1K	(14) MM10K	(15) MM100K	(16) MM500K	(17) MM1K	(18) MM10K	(19) MM100K	(20) MM500K
dummy_ma	0.0005	0.00210*	0.00042	0.00128	0.00021	0.00163	0.00032	0.00117	0.0003	0.00168	0.00029	0.00095	0.00401**	0.00553***	0.00486*	0.00557*	0.00436***	0.00586***	0.00532**	0.00594**
	-0.00139	-0.00126	-0.00184	-0.0021	-0.00136	-0.00121	-0.00183	-0.00209	-0.00136	-0.00121	-0.00182	-0.00206	-0.0016	-0.00195	-0.00262	-0.00286	-0.0016	-0.00198	-0.00271	-0.0029
lag_logcd													0.00408**	0.00466**	0.00386	0.00461	0.00356*	0.00428**	0.00351	0.00477
													-0.00192	-0.00204	-0.00312	-0.00326	-0.00196	-0.00205	-0.0031	-0.00326
dlog_cd													-0.0143**	-0.0129**	-0.0174***	-0.0158**	-0.0147**	-0.0136***	-0.0184***	-0.0163**
													-0.00698	-0.00528	-0.00631	-0.00733	-0.0067	-0.00525	-0.00652	-0.00769
dfed_ma	0.0114	-0.00046	-0.0122	0.00132	0.00922	-0.00047	-0.0121	0.00315	-0.0275	-0.00211	0.0862	0.285	-0.019	-0.0246*	-0.0412*	-0.0183	-0.0977	-0.0496	0.00946	0.186
	-0.00917	-0.0108	-0.0166	-0.0216	-0.00914	-0.0109	-0.0165	-0.0214	-0.0667	-0.15	-0.259	-0.285	-0.0137	-0.0144	-0.0235	-0.0274	-0.0682	-0.16	-0.264	-0.282
dfed_lag_logcd													0.00337	0.00134	-7.93E-05	-0.00268				
													-0.00212	-0.00226	-0.0032	-0.00381				
dfed_dlogcd													0.128***	0.105***	0.136**	0.102				
													-0.0477	-0.0403	-0.0651	-0.0733				
log_cd					0.00261	0.00333*	0.00213	0.00309	0.00231	0.00318*	0.00208	0.00337								
					-0.00189	-0.0019	-0.00296	-0.0031	-0.00191	-0.0019	-0.00295	-0.00311								
dfed_loged					0.00371*	0.00166	0.00046	-0.0022												
					-0.0021	-0.00225	-0.00316	-0.00376												
dfed_ma_loged									0.00272	0.00018	-0.00683	-0.0198								
									-0.00454	-0.0107	-0.0185	-0.0202								
dfed_ma_lag_loged																	0.00623	0.00261	-0.00319	-0.015
																	-0.00442	-0.0111	-0.0186	-0.0199
dfed_ma_dloged																	0.0752**	0.0467	0.0824	0.0969
																	-0.0372	-0.0404	-0.0654	-0.0712
Constant	0.00493***	0.00452***	0.00346***	0.00559***	-0.0288	-0.0382	-0.0236	-0.0339	-0.0246	-0.0362	-0.0231	-0.0378	-0.0477*	-0.0551**	-0.0459	-0.0535	-0.041	-0.0504*	-0.0418	-0.056
	-7.82E-05	-7.04E-05	-0.00011	-0.00012	-0.0252	-0.025	-0.0394	-0.0412	-0.0256	-0.025	-0.0392	-0.0413	-0.0257	-0.0269	-0.0415	-0.0433	-0.0261	-0.027	-0.0413	-0.0432
Observations	17648	27515	22898	20058	17303	26982	22427	19720	17303	26982	22427	19720	17303	26982	22427	19720	17303	26982	22427	19720
R-squared	0.975	0.959	0.918	0.91	0.976	0.959	0.919	0.91	0.975	0.959	0.919	0.91	0.976	0.959	0.919	0.91	0.976	0.959	0.919	0.91
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A8: Minimum fund requirement and Deposit beta across SAV products (M&A)

VARIABLES	(1) SAV1K	(2) SAV10K	(3) SAV100K	(4) SAV500K	(5) SAV1K	(6) SAV10K	(7) SAV100K	(8) SAV500K	(9) SAV1K	(10) SAV10K	(11) SAV100K	(12) SAV500K	(13) SAV1K	(14) SAV10K	(15) SAV100K	(16) SAV500K	(17) SAV1K	(18) SAV10K	(19) SAV100K	(20) SAV500K
dummy_ma	0.00201	0.00055	0.00071	0.00076	0.00147	7.97E-05	0.00014	0.00019	0.00159	0.00023	0.00029	0.00034	0.00363	0.00145	0.00219**	0.00229**	0.00386*	0.00167	0.00252**	0.00259**
	-0.00141	-0.00074	-0.00079	-0.0008	-0.00146	-0.00074	-0.0008	-0.00081	-0.00145	-0.00075	-0.0008	-0.00081	-0.00226	-0.00102	-0.00111	-0.00113	-0.00227	-0.00105	-0.00115	-0.00116
lag_logcd													0.00366**	0.00371**	0.00449***	0.00453***	0.00332**	0.00333**	0.00409***	0.00412***
													-0.00145	-0.00148	-0.00149	-0.00149	-0.00145	-0.00148	-0.00148	-0.00148
dlog_cd													-0.00578	-0.00241	-0.00453*	-0.00459*	-0.00638	-0.00296	-0.00522**	-0.00523**
													-0.00428	-0.00248	-0.00259	-0.00262	-0.00429	-0.00249	-0.00263	-0.00266
dfed_ma	0.00554	0.0037	0.00228	0.00105	0.00513	0.00191	0.00056	-0.00055	-0.0658**	-0.0845**	-0.0952**	-0.0872**	0.00076	-0.00196	-0.00742	-0.00779	-0.0801*	-0.0873**	-0.120**	-0.107**
	-0.00459	-0.00476	-0.00569	-0.00565	-0.00453	-0.00472	-0.00563	-0.00561	-0.032	-0.0349	-0.0409	-0.041	-0.00655	-0.00656	-0.008	-0.00827	-0.0424	-0.0434	-0.0543	-0.053
dfed_lag_logcd													0.00359***	0.00393***	0.00432***	0.00424***				
													-0.00113	-0.00108	-0.00112	-0.00119				
dfed_dlogcd													0.0222	0.0222	0.0396*	0.0358				
													-0.0197	-0.0215	-0.0236	-0.0241				
log_cd					0.00305**	0.00339**	0.00385***	0.00390***	0.00273*	0.00294**	0.00349**	0.00353**								
					-0.0014	-0.00139	-0.00139	-0.00138	-0.0014	-0.00139	-0.00139	-0.00138								
dfed_loged					0.00366***	0.00401***	0.00448***	0.00440***												
					-0.00113	-0.00108	-0.00112	-0.00119												
dfed_ma_loged									0.00519**	0.00630***	0.00699**	0.00636**								
									-0.0021	-0.00229	-0.00273	-0.00272								
dfed_ma_lag_loged																	0.00591**	0.00641**	0.00814**	0.00724**
																	-0.00257	-0.00264	-0.0033	-0.00321
dfed_ma_dloged																	0.0195	0.0108	0.0377	0.0319
																	-0.0227	-0.024	-0.0318	-0.0306
Constant	0.00466***	0.00473***	0.00532***	0.00574***	-0.0345*	-0.0377**	-0.0444**	-0.0446**	-0.0301	-0.0330*	-0.0395**	-0.0395**	-0.0424**	-0.0430**	-0.0526***	-0.0526***	-0.0378**	-0.0381*	-0.0472**	-0.0472**
	-7.67E-05	-4.05E-05	-4.27E-05	-4.27E-05	-0.0184	-0.0183	-0.0182	-0.0182	-0.0184	-0.0183	-0.0182	-0.0182	-0.019	-0.0194	-0.0195	-0.0195	-0.0191	-0.0194	-0.0194	-0.0194
Observations	27760	26618	25901	25722	27284	26206	25494	25316	27284	26206	25494	25316	27284	26206	25494	25316	27284	26206	25494	25316
R-squared	0.98	0.982	0.981	0.98	0.98	0.982	0.981	0.981	0.98	0.982	0.981	0.98	0.98	0.982	0.981	0.981	0.98	0.982	0.981	0.98
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A9: Maturity and Deposit beta to fed funds rate across CD products (M&A)

VARIABLES	(1) 12MCD10K	(2) 24MCD10K	(3) 36MCD10K	(4) 48MCD10K	(5) 60MCD10K	(6) 12MCD10K	(7) 24MCD10K	(8) 36MCD10K	(9) 48MCD10K	(10) 60MCD10K	(11) 12MCD10K	(12) 24MCD10K	(13) 36MCD10K	(14) 48MCD10K	(15) 60MCD10K	(16) 12MCD10K	(17) 24MCD10K	(18) 36MCD10K	(19) 48MCD10K	(20) 60MCD10K	(21) 12MCD10K	(22) 24MCD10K	(23) 36MCD10K	(24) 48MCD10K	(25) 60MCD10K
dummy_ma	0.00178	0.00173	-0.0023	-0.00261	-0.0014	0.00088	0.00076	-0.0036	-0.00368	-0.00346	0.00171	0.0017	-0.00273	-0.00286	-0.0026	0.00189	0.00333	-8.97E-05	-0.00122	0.00135	0.00342	0.00513	0.00178	0.00061	0.00348
	-0.00289	-0.00321	-0.00352	-0.00351	-0.00409	-0.00288	-0.0032	-0.0035	-0.00356	-0.00408	-0.0029	-0.00325	-0.00353	-0.00359	-0.0041	-0.00365	-0.00417	-0.00417	-0.00439	-0.00479	-0.00381	-0.00431	-0.0043	-0.00451	-0.00487
lag_logcd																0.00733**	0.00899**	0.0121***	0.00931*	0.0158***	0.00526	0.00678*	0.00955**	0.00692	0.0137**
																-0.00362	-0.00401	-0.00426	-0.0048	-0.00537	-0.00368	-0.00409	-0.00432	-0.00485	-0.00549
dlog_cd																0.00283	-0.00251	-0.00371	-0.00214	-0.00669	-0.00106	-0.00683	-0.00845	-0.00656	-0.0114
																-0.00939	-0.0106	-0.0127	-0.0133	-0.0152	-0.00963	-0.0109	-0.0129	-0.0135	-0.0153
dfed_ma	0.0404	0.0447*	0.0323	0.0497**	0.0407*	0.0275	0.0296	0.018	0.0371	0.0292	-0.540***	-0.589***	-0.430**	-0.287	-0.396*	0.0219	0.0225	0.00486	0.0199	0.00972	-0.626***	-0.700***	-0.573**	-0.439*	-0.580**
	-0.025	-0.0245	-0.0232	-0.0231	-0.024	-0.0248	-0.0242	-0.023	-0.023	-0.0239	-0.192	-0.217	-0.199	-0.207	-0.216	-0.0311	-0.0303	-0.0289	-0.0289	-0.0298	-0.226	-0.244	-0.227	-0.236	-0.236
dfed_lag_logcd																0.0253***	0.0272***	0.0279***	0.0263***	0.0265***					
																-0.00471	-0.00506	-0.00486	-0.00487	-0.00489					
dfed_dlogcd																0.0497	0.0586	0.0858	0.103	0.112					
																-0.0782	-0.0814	-0.0833	-0.0848	-0.0875					
log_cd						0.00700*	0.00824**	0.0110***	0.00839*	0.0142***	0.00484	0.00591	0.00838**	0.00592	0.0121**										
						-0.00357	-0.00399	-0.00419	-0.00472	-0.0053	-0.00362	-0.00406	-0.00424	-0.00477	-0.00541										
dfed_logcd						0.0254***	0.0273***	0.0261***	0.0270***	0.0268***															
						-0.0047	-0.00505	-0.00485	-0.00486	-0.0049															
dfed_ma_logcd											0.0413***	0.0450***	0.0329**	0.0240*	0.0310**										
											-0.0132	-0.0151	-0.0138	-0.0143	-0.0148										
dfed_ma_lag_logcd																					0.0457***	0.0507***	0.0402***	0.0318**	0.0405***
																					-0.0146	-0.0161	-0.0148	-0.0153	-0.0154
dfed_ma_dlogcd																					0.125	0.155	0.173	0.176	0.209*
																					-0.118	-0.125	-0.125	-0.126	-0.122
Constant	0.00314***	0.00718***	0.0114***	0.0153***	0.0187***	-0.0888*	-0.101*	-0.134**	-0.0956	-0.170**	-0.0597	-0.0698	-0.0984*	-0.0621	-0.142**	-0.0930*	-0.111**	-0.148***	-0.107*	-0.190***	-0.0651	-0.081	-0.113**	-0.0751	-0.162**
	-0.00016	-0.00018	-0.0002	-0.0002	-0.00023	-0.0469	-0.0525	-0.0553	-0.0625	-0.0705	-0.0477	-0.0535	-0.056	-0.0631	-0.0719	-0.0476	-0.0529	-0.0562	-0.0635	-0.0714	-0.0484	-0.0539	-0.0569	-0.0641	-0.0729
Observations	28481	27818	27265	24600	24389	27943	27280	26735	24108	23906	27943	27280	26735	24108	23906	27943	27280	26735	24108	23906	27943	27280	26735	24108	23906
R-squared	0.765	0.714	0.696	0.685	0.634	0.77	0.718	0.698	0.687	0.636	0.768	0.716	0.696	0.684	0.634	0.77	0.718	0.698	0.687	0.636	0.768	0.716	0.696	0.685	0.634
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A10: Maturity and Deposit beta to market yield on treasury securities across CD products (M&A)

VARIABLES	(1) 12MCD10K	(2) 24MCD10K	(3) 36MCD10K	(4) 60MCD10K	(5) 12MCD10K	(6) 24MCD10K	(7) 36MCD10K	(8) 60MCD10K	(9) 12MCD10K	(10) 24MCD10K	(11) 36MCD10K	(12) 60MCD10K	(13) 12MCD10K	(14) 24MCD10K	(15) 36MCD10K	(16) 60MCD10K	(17) 12MCD10K	(18) 24MCD10K	(19) 36MCD10K	(20) 60MCD10K
dummy_ma	0.00136	0.00141	-0.0024	-0.00092	0.00064	0.00073	-0.00329	-0.00255	0.00161	0.00182	-0.00246	-0.00155	0.00159	0.00335	0.00043	0.00229	0.00323	0.00538	0.00202	0.00408
	-0.00297	-0.00324	-0.00353	-0.00398	-0.00297	-0.00326	-0.00354	-0.00399	-0.00306	-0.00335	-0.00357	-0.00403	-0.00377	-0.00426	-0.00423	-0.00469	-0.00395	-0.00438	-0.00425	-0.00472
lag_logcd													0.00714**	0.00882**	0.0118***	0.0152***	0.00529	0.00692*	0.00970**	0.0138**
													-0.00363	-0.00404	-0.00429	-0.00542	-0.00368	-0.00408	-0.00431	-0.00547
dlog_cd													0.00298	-0.00285	-0.00522	-0.00759	-0.00095	-0.0068	-0.00832	-0.0105
													-0.00958	-0.0108	-0.0129	-0.0151	-0.00971	-0.0109	-0.013	-0.0152
dfed_ma	0.0473*	0.0424*	0.0334	0.0362*	0.0342	0.0292	0.0237	0.03	-0.563**	-0.511***	-0.333*	-0.464**	0.0331	0.022	0.00262	0.0104	-0.615**	-0.636***	-0.481**	-0.614***
	-0.025	-0.0232	-0.0225	-0.0209	-0.0249	-0.0231	-0.0225	-0.0211	-0.219	-0.196	-0.193	-0.182	-0.0317	-0.0293	-0.0277	-0.0268	-0.243	-0.228	-0.226	-0.202
dfed_lag_logcd													0.0236***	0.0212***	0.0168***	0.0116***				
													-0.00491	-0.00468	-0.00402	-0.00444				
dfed_dlogcd													0.0283	0.0526	0.108	0.0962				
													-0.0818	-0.0791	-0.0783	-0.074				
log_cd					0.00688*	0.00802**	0.0104**	0.0134**	0.0049	0.00601	0.00851**	0.0122**								
					-0.00358	-0.00402	-0.00421	-0.00535	-0.00362	-0.00406	-0.00425	-0.0054								
dfed_logcd					0.0236***	0.0213***	0.0170***	0.0117***												
					-0.00491	-0.00468	-0.00401	-0.00445												
dfed_ma_logcd									0.0434***	0.0392***	0.0261*	0.0357***								
									-0.0154	-0.0135	-0.0134	-0.0127								
dfed_ma_lag_logcd																	0.0461***	0.0457***	0.0338**	0.0434***
																	-0.0163	-0.0148	-0.0149	-0.0134
dfed_ma_dlogcd																	0.0964	0.165	0.176	0.192*
																	-0.116	-0.12	-0.12	-0.106
Constant	0.00494***	0.00567***	0.00727***	0.00269***	-0.0859*	-0.0990*	-0.128**	-0.172**	-0.0586	-0.0724	-0.104*	-0.158**	-0.0893*	-0.109**	-0.146***	-0.195***	-0.0636	-0.0841	-0.119**	-0.180**
	-0.00016	-0.00018	-0.0002	-0.00023	-0.0472	-0.0529	-0.0555	-0.0712	-0.0477	-0.0535	-0.056	-0.0718	-0.0477	-0.0532	-0.0565	-0.072	-0.0484	-0.0538	-0.0568	-0.0727
Observations	28464	27801	27248	24389	27927	27264	26719	23906	27927	27264	26719	23906	27927	27264	26719	23906	27927	27264	26719	23906
R-squared	0.734	0.72	0.742	0.723	0.739	0.724	0.745	0.727	0.738	0.723	0.744	0.727	0.739	0.724	0.745	0.727	0.738	0.723	0.744	0.727
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

B.3 Baseline results with all banks

Complaints, account quantities, and the customer base

Table A11 relates complaint measures to the number of deposit accounts and rates. This is a complementary diagnostic: if complaints proxy for customer attention/search, they may correlate with changes in the extensive margin of relationships (accounts) and with pricing.

Table A11: Deposit accounts and complaints

	log_account							
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
L.complaint	-0.000166	-1.12e-05	-4.96e-05	-2.91e-05				
	(0.000139)	(7.19e-05)	(3.64e-05)	(6.71e-05)				
L.log_complaint					0.0319	-0.0149	-0.0350	-0.0271
					(0.0641)	(0.0302)	(0.0346)	(0.0324)
L.rate_cd		-0.0862				-0.112		
		(0.104)				(0.122)		
L.rate_mm			0.195***				0.212***	
			(0.0656)				(0.0679)	
L.rate_savings				-0.0329				-0.0338
				(0.229)				(0.225)
Constant	13.31***	13.41***	13.23***	13.43***	13.65***	14.01***	13.90***	14.05***
	(0.0272)	(0.0546)	(0.0157)	(0.0411)	(0.197)	(0.109)	(0.111)	(0.122)
Observations	2,461	1,809	1,679	1,642	2,082	1,504	1,375	1,364
R-squared	0.931	0.988	0.994	0.991	0.912	0.984	0.992	0.988
Time FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank name FE	Y	Y	Y	Y	Y	Y	Y	Y

While complaints are an imperfect proxy, Table A11 helps motivate the interpretation used in the main text: complaint measures are not simply a mechanical function of account counts, and pricing covaries with quantities in ways consistent with active vs. sleepy depositor segments.

Baseline passthrough and composition effects in the full sample

Tables A12 and A13 replicate baseline spread passthrough results in the full bank sample. The main message is that the key composition patterns carry over: core-deposit measures are associated with higher spread passthrough (lower betas) in CDs and savings, while money market accounts exhibit more elastic behavior.

Table A12: Baseline spread passthrough: include all banks

	(1) 12 Mo CD	(2) MM	(3) Savings	(4) 12 Mo CD	(5) MM	(6) Savings	(7) 12 Mo CD	(8) MM	(9) Savings
log_cd	0.0215***	0.00663***	0.00514***						
	(0.00229)	(0.00140)	(0.000835)						
dfed_logcd	0.00365	-0.00775***	0.00121						
	(0.00260)	(0.00140)	(0.000772)						
log_cd1				0.0182***	0.00376**	0.00365***			
				(0.00237)	(0.00166)	(0.000809)			
dfed_logcd1				0.00348	-0.00783***	0.00107			
				(0.00277)	(0.00150)	(0.000876)			
log_cd2							0.0167***	0.00186	0.00445***
							(0.00215)	(0.00156)	(0.000820)
dfed_logcd2							-0.00284	-0.00638***	2.03e-05
							(0.00313)	(0.00173)	(0.00103)
Constant	-0.254***	-0.0731***	-0.0541***	-0.208***	-0.0371*	-0.0350***	-0.171***	0.0170	-0.0157
	(0.0278)	(0.0171)	(0.0101)	(0.0280)	(0.0197)	(0.00955)	(0.0261)	(0.0189)	(0.00991)
Observations	147,081	139,439	137,099	147,289	139,643	137,313	134,345	127,529	125,737
R-squared	0.768	0.944	0.983	0.767	0.944	0.983	0.634	0.896	0.966
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y	Y

Robust standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A13: Baseline: include all banks (lag and dlog core deposit)

	(1) 12 Mo CD	(2) MM	(3) Savings
lag_logcd	0.0251***	0.00889***	0.00624***
	(0.00228)	(0.00146)	(0.000898)
dlog_cd	-0.00959*	-0.0135***	-0.00235
	(0.00510)	(0.00288)	(0.00164)
dfed*lag_logcd	0.00349	-0.00775***	0.000810
	(0.00264)	(0.00144)	(0.000801)
dfed_dlogcd	0.0224	-0.00563	0.0410***
	(0.0383)	(0.0251)	(0.0127)
Constant	-0.297***	-0.100***	-0.0672***
	(0.0276)	(0.0177)	(0.0109)
Observations	147,081	139,439	137,099
R-squared	0.768	0.944	0.983
Time FE	Y	Y	Y
Bank FE	Y	Y	Y

Robust standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Minimum-balance and maturity checks in the full sample. Tables A14–A17 show that the same qualitative relationship between customer-base captivity and passthrough is visible across product definitions and maturity benchmarks.

Table A14: Minimum fund requirement and Deposit beta across CD products (all banks)

VARIABLES	(1) 12MCD1K	(2) 12MCD10K	(3) 12MCD100K	(4) 12MCD500K	(5) 12MCD1K	(6) 12MCD10K	(7) 12MCD100K	(8) 12MCD500K
lag_logcd					0.0246***	0.0252***	0.0256***	0.0253***
					-0.00247	-0.00228	-0.00238	-0.00238
dlog_cd					-0.00779	-0.0106**	-0.00885	-0.00824
					-0.00543	-0.00504	-0.00543	-0.00543
dfed_lag_logcd					0.00433	0.00517**	0.00244	0.0029
					-0.00288	-0.00261	-0.00278	-0.0028
dfed_dlogcd					0.00352	0.0309	0.0309	0.0254
					-0.041	-0.0381	-0.0403	-0.0412
log_cd	0.0212***	0.0214***	0.0220***	0.0218***				
	-0.00247	-0.00229	-0.0024	-0.0024				
dfed_logcd	0.00429	0.00539**	0.00268	0.00309				
	-0.00283	-0.00256	-0.00273	-0.00275				
Constant	-0.249***	-0.253***	-0.260***	-0.257***	-0.291***	-0.298***	-0.304***	-0.299***
	-0.0299	-0.0277	-0.0292	-0.029	-0.0299	-0.0276	-0.0289	-0.0288
Observations	123647	146767	141180	138279	123647	146767	141180	138279
R-squared	0.774	0.771	0.76	0.762	0.774	0.772	0.76	0.762
Time FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y

Table A15: Minimum fund requirement and Deposit beta across MM products (all banks)

VARIABLES	(1) MM1K	(2) MM10K	(3) MM100K	(4) MM500K	(5) MM1K	(6) MM10K	(7) MM100K	(8) MM500K
lag_logcd					0.00682***	0.00793***	0.0114***	0.0116***
					-0.00148	-0.00123	-0.00202	-0.00227
dlog_cd					-0.00569**	-0.00820***	-0.0124***	-0.00908**
					-0.0029	-0.00238	-0.00358	-0.00384
dfed_lag_logcd					-7.03E-05	-0.00289**	-0.00850***	-0.00957***
					-0.00133	-0.00118	-0.00173	-0.00198
dfed_dlogcd					0.0159	0.0128	-0.0262	-0.0697*
					-0.0259	-0.0205	-0.0315	-0.0374
log_cd	0.00541***	0.00623***	0.00905***	0.00963***				
	-0.00145	-0.00119	-0.00195	-0.0022				
dfed_logcd	6.99E-05	-0.00274**	-0.00870***	-0.0102***				
	-0.00126	-0.00114	-0.00169	-0.00194				
Constant	-0.0578***	-0.0675***	-0.102***	-0.106***	-0.0750***	-0.0880***	-0.131***	-0.131***
	-0.0179	-0.0145	-0.0238	-0.0268	-0.0182	-0.015	-0.0247	-0.0276
Observations	77617	138954	108183	98438	77617	138954	108183	98438
R-squared	0.971	0.962	0.925	0.919	0.971	0.962	0.925	0.919
Time FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y

Table A16: Minimum fund requirement and Deposit beta across SAV products (all banks)

VARIABLES	(1) SAV1K	(2) SAV10K	(3) SAV100K	(4) SAV500K	(5) SAV1K	(6) SAV10K	(7) SAV100K	(8) SAV500K
lag_logcd					0.00636***	0.00619***	0.00640***	0.00639***
					-0.00088	-0.0009	-0.00092	-0.00092
dlog_cd					-0.00216	-0.00193	-0.00257	-0.00255
					-0.00136	-0.00164	-0.00169	-0.00169
dfed_lag_logcd					0.00078	0.00085	0.00063	0.00059
					-0.00079	-0.0008	-0.00084	-0.00086
dfed_dlogcd					0.0354***	0.0403***	0.0429***	0.0428***
					-0.0109	-0.0127	-0.0131	-0.0132
log_cd	0.00530***	0.00515***	0.00524***	0.00524***				
	-0.00082	-0.00084	-0.00085	-0.00086				
dfed_logcd	0.00111	0.00124	0.00106	0.00102				
	-0.00077	-0.00077	-0.00081	-0.00083				
Constant	-0.0563***	-0.0543***	-0.0548***	-0.0546***	-0.0689***	-0.0667***	-0.0686***	-0.0683***
	-0.00999	-0.0102	-0.0103	-0.0104	-0.0107	-0.0109	-0.0111	-0.0112
Observations	142317	136792	132419	132147	142317	136792	132419	132147
R-squared	0.984	0.984	0.983	0.983	0.984	0.984	0.983	0.983
Time FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y

Table A17: Maturity and Deposit beta to market yield on treasury securities across CD products (all banks)

VARIABLES	(1) 12MCD10K	(2) 24MCD10K	(3) 36MCD10K	(4) 60MCD10K	(5) 12MCD10K	(6) 24MCD10K	(7) 36MCD10K	(8) 60MCD10K
lag_logcd					0.00734**	0.00905**	0.0118***	0.0153***
					-0.00363	-0.00404	-0.00429	-0.00542
dlog_cd					0.00556	0.00254	-0.00453	-0.00396
					-0.00766	-0.00837	-0.0107	-0.0127
dfed_lag_logcd					0.0238***	0.0213***	0.0169***	0.0117***
					-0.0049	-0.00467	-0.004	-0.0044
dfed_dlogcd					0.0811	0.0875	0.112*	0.113*
					-0.0636	-0.0621	-0.063	-0.0579
log_cd	0.00698*	0.00812**	0.00965**	0.0127**				
	-0.00357	-0.004	-0.00421	-0.00534				
dfed_logcd	0.0241***	0.0217***	0.0173***	0.0121***				
	-0.00488	-0.00465	-0.00398	-0.00439				
Constant	-0.0872*	-0.100*	-0.119**	-0.162**	-0.0918*	-0.112**	-0.146***	-0.197***
	-0.047	-0.0527	-0.0556	-0.071	-0.0478	-0.0532	-0.0565	-0.072
Observations	27927	27264	26719	23906	27927	27264	26719	23906
R-squared	0.739	0.724	0.745	0.727	0.739	0.724	0.745	0.727
Time FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y

Rate-sensitive depositor base: large/uninsured deposits. Tables A18 and A19 provide a useful "placebo/discipline" check: when a bank's funding is tilted toward more rate-sensitive segments (large balances or uninsured deposits), spread passthrough is weaker (implying higher deposit betas). This aligns with the model's mapping in which a less captive depositor base increases the elasticity of deposit supply and compresses banks' ability to keep deposit rates rigid.

Table A18: Large deposit share

	12 Mo CD		MM		Savings	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
largedep_share	0.0186**	0.000243	0.0103**	0.00588	0.00485*	0.000384
	(0.00781)	(0.00816)	(0.00477)	(0.00519)	(0.00276)	(0.00275)
log_cd		0.0207***		0.00574***		0.00502***
		(0.00236)		(0.00150)		(0.000830)
dfed × largedep_share	-0.0616**	-0.0912***	-0.0783***	-0.0529***	-0.00437	-0.0115
	(0.0256)	(0.0289)	(0.0141)	(0.0159)	(0.00794)	(0.00977)
dfed × log_cd		0.00784***		-0.00533***		0.00173*
		(0.00293)		(0.00159)		(0.000958)
Constant	0.00106	-0.245***	0.00392***	-0.0643***	0.00666***	-0.0529***
	(0.00238)	(0.0280)	(0.00146)	(0.0176)	(0.000834)	(0.00997)
Observations	147,306	147,077	139,660	139,435	137,319	137,095
R-squared	0.767	0.768	0.944	0.944	0.983	0.983
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

Table A19: Uninsured deposits

	12 Mo CD		MM		Savings	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
log_uninsured	0.00928***	0.000771	0.00342***	0.00136	0.00200***	-0.000150
	(0.00128)	(0.00178)	(0.000861)	(0.00128)	(0.000488)	(0.000569)
log_cd		0.0201***		0.00485**		0.00523***
		(0.00300)		(0.00201)		(0.00100)
dfed × log_uninsured	4.24e-05	-0.0422***	-0.00776***	-0.0199***	0.000506	-0.00664**
	(0.00221)	(0.00847)	(0.00118)	(0.00463)	(0.000639)	(0.00272)
dfed × log_cd		0.0520***		0.0149***		0.00882***
		(0.0101)		(0.00549)		(0.00330)
Constant	-0.0946***	-0.247***	-0.0301***	-0.0668***	-0.0137***	-0.0537***
	(0.0140)	(0.0278)	(0.00944)	(0.0174)	(0.00531)	(0.0101)
Observations	147,170	146,941	139,608	139,383	137,184	136,960
R-squared	0.767	0.768	0.944	0.944	0.983	0.983
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

Robustness: alternative merger indicator (dummy_ma2)

The following tables replace `dummy_ma` with `dummy_ma2`. Across outcomes (core deposits, offered rates, and passthrough interactions), the qualitative conclusions are unchanged: merger completion is associated with increases in relationship funding and decreases in offered rates, and passthrough patterns remain consistent with increased deposit-market power in merger windows.

Table A20: Replace dummy_ma with dummy_ma2 for Table 6

	log_cd	dlog_cd
VARIABLES	(2)	(4)
dummy_ma2	0.274***	0.0767***
	(0.0131)	(0.00156)
Constant	12.99***	0.0190***
	(0.00123)	(0.000149)
Observations	189,008	183,858
R-squared	0.907	0.077
Time FE	Y	Y
Bank FE	Y	Y

Table A21: Replace dummy_ma with dummy_ma2 for Table 7

VARIABLES	12 Mo CD (1)	MM (2)	Savings (3)
dummy_ma2	-0.0173***	-0.00582*	-0.00242
	(0.00658)	(0.00345)	(0.00219)
Constant	0.526***	0.237***	0.140***
	(0.000974)	(0.000514)	(0.000325)
Observations	29,598	28,594	27,664
R-squared	0.644	0.569	0.648
Time FE	Y	Y	Y
Bank FE	Y	Y	Y

Table A22: Replace dummy_ma with dummy_ma2 for Table 8

VARIABLES	12 Mo CD (1)	MM (2)	Savings (3)
dfedtar × dummy_ma2	0.0198	-0.00881	-0.00618
	(0.0164)	(0.00912)	(0.00456)
dummy_ma2	-0.000795	7.65e-05	0.00124*
	(0.00233)	(0.00116)	(0.000645)
Constant	0.00353***	0.00386***	0.00451***
	(0.000358)	(0.000180)	(9.93e-05)
Observations	28,562	27,518	26,663
R-squared	0.761	0.940	0.981
Time FE	Y	Y	Y
Bank FE	Y	Y	Y

Table A23: Replace dummy_ma with dummy_ma2 for Table 9

	12 Mo CD		MM		Savings	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
dummy_ma2	-0.000525	-8.25e-06	0.000302	0.000258	0.00121*	0.00132**
	(0.00238)	(0.00240)	(0.00119)	(0.00121)	(0.000650)	(0.000663)
log_cd1	0.00118	0.00103	0.000216	0.000225	0.000254	0.000209
	(0.000959)	(0.000970)	(0.000634)	(0.000634)	(0.000344)	(0.000346)
dfedtar × dummy_ma2	0.00365	-0.573***	-0.00754	0.0418	-0.00810*	-0.101***
	(0.0166)	(0.114)	(0.00958)	(0.104)	(0.00458)	(0.0311)
dfedtar × log_cd1	0.0276***		-0.00162		0.00536***	
	(0.00531)		(0.00313)		(0.00123)	
dfedtar × dummy_ma2 × log_cd1		0.0435***		-0.00369		0.00708***
		(0.00802)		(0.00762)		(0.00216)
Constant	-0.0120	-0.00875	0.00225	0.00206	0.00195	0.00275
	(0.0122)	(0.0123)	(0.00810)	(0.00808)	(0.00439)	(0.00441)
Observations	28,066	28,066	27,014	27,014	26,285	26,285
R-squared	0.765	0.764	0.940	0.940	0.982	0.982
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

Table A24: Replace dummy_ma with dummy_ma2 for Table 10

	12 Mo CD		MM		Savings	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
dummy_ma2	-0.00117	-0.00123	0.000108	0.000290	0.00151*	0.00142*
	(0.00233)	(0.00232)	(0.00132)	(0.00131)	(0.000812)	(0.000818)
log_cd2	0.00166*	0.00213**	0.000632	0.000535	0.000321	0.000492
	(0.000852)	(0.000834)	(0.000590)	(0.000590)	(0.000315)	(0.000315)
dfedtar × dummy_ma2	0.0128	-0.458***	-0.00640	-0.126	-0.0131**	-0.0931***
	(0.0200)	(0.120)	(0.0113)	(0.0864)	(0.00634)	(0.0321)
dfedtar × log_cd2	0.0207***		-0.000798		0.00590***	
	(0.00638)		(0.00345)		(0.00141)	
dfedtar × dummy_ma2 × log_cd2		0.0345***		0.00844		0.00603***
		(0.00833)		(0.00605)		(0.00211)
Constant	-0.00228	0.00190	0.0287***	0.0295***	0.0312***	0.0319***
	(0.0108)	(0.0109)	(0.00777)	(0.00773)	(0.00417)	(0.00414)
Observations	25,451	25,451	24,521	24,521	23,870	23,870
R-squared	0.623	0.622	0.890	0.890	0.966	0.966
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

Table A25: Replace dummy_ma with dummy_ma2 for Table 11

	12 Mo CD		MM		Savings	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
log_cd	0.00126	0.00130	0.000420	0.000468	0.000479	0.000292
	(0.000906)	(0.000986)	(0.000596)	(0.000622)	(0.000344)	(0.000347)
largedep_share	-0.00663	-0.00764	0.00222	0.00281	5.62e-05	0.000727
	(0.0102)	(0.0103)	(0.00718)	(0.00721)	(0.00356)	(0.00355)
dummy_ma2		-9.74e-05		0.000196		0.00129**
		(0.00239)		(0.00120)		(0.000651)
dfedtar × dummy_ma2		-0.583***		0.0342		-0.103***
		(0.111)		(0.102)		(0.0310)
dfedtar × log_cd	0.0327***		0.000111		0.00698***	
	(0.00597)		(0.00357)		(0.00187)	
dfedtar × largedep_share	-0.152**		-0.0466		-0.0525*	
	(0.0754)		(0.0429)		(0.0318)	
dfedtar × dummy_ma2 × log_cd		0.0431***		-0.00297		0.00774***
		(0.00877)		(0.00793)		(0.00266)
dfedtar × dummy_ma2 × largedep_share		-0.0125		-0.00203		-0.0268
		(0.145)		(0.0920)		(0.0425)
Constant	-0.0114	-0.0100	-0.00130	-0.00218	-0.000980	0.00135
	(0.0108)	(0.0117)	(0.00696)	(0.00724)	(0.00434)	(0.00431)
Observations	28,033	28,033	26,981	26,981	26,252	26,252
R-squared	0.765	0.764	0.940	0.940	0.982	0.982
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y

Table A26: Replace dummy_ma with dummy_ma2 for Table 12

	12 Mo CD		MM		Savings	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
log_cd	0.00573*	0.00581*	0.00196	0.00214	0.000774	0.000519
	(0.00317)	(0.00324)	(0.00213)	(0.00215)	(0.00106)	(0.00106)
log_uninsured	-0.00431	-0.00434	-0.00138	-0.00146	-0.000273	-0.000182
	(0.00270)	(0.00271)	(0.00186)	(0.00187)	(0.000933)	(0.000925)
dummy_ma2		-0.000279		9.74e-05		0.00125*
		(0.00239)		(0.00120)		(0.000646)
dfedtar × dummy_ma2		-0.666***		0.0152		-0.139***
		(0.148)		(0.124)		(0.0487)
dfedtar × log_cd	0.0995***		0.0231		0.0317***	
	(0.0281)		(0.0159)		(0.0112)	
dfedtar × log_uninsured	-0.0655***		-0.0223		-0.0240**	
	(0.0244)		(0.0136)		(0.00988)	
dfedtar × dummy_ma2 × log_cd		0.0857		0.00660		0.0262
		(0.0555)		(0.0369)		(0.0171)
dfedtar × dummy_ma2 × log_uninsured		-0.0394		-0.00882		-0.0178
		(0.0513)		(0.0331)		(0.0152)
Constant	-0.0211	-0.0194	-0.00432	-0.00550	-0.00177	0.000811
	(0.0132)	(0.0141)	(0.00830)	(0.00846)	(0.00476)	(0.00479)
Observations	28,033	28,033	26,981	26,981	26,252	26,252
R-squared	0.765	0.764	0.940	0.940	0.982	0.982
Time FE	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y