Confidence, Credit, and Financial Regimes: A DSGE Model with Banking and Default

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Abstract

This paper studies how consumer and business confidence shocks transmit to bank credit markets and whether that transmission varies across financial regimes. We develop a DSGE model with an explicit banking sector, a nominal monetary block, and realized loan-default losses, in which a funding wedge links household and firm sentiment directly to bank intermediation costs and net worth. Calibrated to U.S. macro-financial data, the model generates an environment in which the sensitivity of funding spreads to sentiment declines with the intensity of official backstops and can quantitatively account for the regime-dependent shift in credit dynamics observed during both the Great Financial Crisis and the COVID-19 pandemic. We find that confidence shocks are the dominant driver of credit fluctuations in pre-crisis regimes, compressing spreads and expanding lending, while expected-default shocks become the primary source of credit volatility once stronger regulation and policy support attenuate the sentiment channel. The model accounts for the persistent reduction in credit sensitivity to confidence that follows major crises and for the accompanying shift toward risk-based pricing of intermediated funds.

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1 Introduction

Periods of financial stress rarely begin with a collapse in fundamentals. They often start with a loss of confidence that tightens credit conditions and amplifies real downturns. The subprime collapse of 2007 and the early-2020 credit freeze illustrate how abrupt shifts in sentiment can transmit local disturbances into economy-wide contractions through the banking system. In both episodes, confidence deteriorated before balance sheets did: borrowing slowed, lending spreads widened, and investment fell well ahead of any measurable rise in default risk. These patterns suggest that expectations and perceptions can move financial aggregates as forcefully as fundamentals. Understanding how confidence interacts with bank lending and policy interventions is therefore central to explaining credit cycles and to designing effective stabilization policy.

The macrofinance literature has established that financial frictions amplify productivity and collateral shocks (Kiyotaki and Moore, 1997; Jermann and Quadrini, 2012; Gilchrist and Zakrajšek, 2012). These studies show that leverage constraints and intermediation costs shape business-cycle dynamics, but they typically treat confidence as endogenous to fundamentals rather than as an independent source of disturbance. Empirical research points to a distinct role for sentiment: Barsky and Sims (2012) and Bachmann et al. (2013) find that innovations in confidence indices explain a substantial share of macroeconomic volatility even after controlling for fundamentals. What remains less well understood is how consumer and business confidence affect credit conditions, and whether their transmission differs when financial systems are under stress rather than stable.

This paper addresses those questions by developing a regime-dependent theory of credit transmission in which sentiment and risk interact structurally within the banking sector. Confidence enters banks' marginal funding costs through a funding wedge, directly affecting intermediation spreads and credit supply. The model embeds an explicit banking sector within a DSGE framework with leverage constraints, financial frictions, nominal rigidities, and two sentiment channels—consumer and business confidence. An expected-default process generates realized loan losses that feed back into bank net worth and lending capacity, while monetary policy operates through a Taylor rule complemented by a liquidity backstop. Calibrated to U.S. macro-financial data across two major episodes—the Great Financial Crisis and the COVID-19 pandemic—the framework is used to examine how credit, spreads, and net worth respond to confidence and default shocks before and after each crisis onset.

The results reveal a clear pattern of regime dependence. Before the GFC, confidence shocks dominated credit fluctuations: household and firm optimism compressed funding spreads and expanded lending, while expected-default shocks accounted for modest variation. After the crisis, regulatory reforms and liquidity facilities reduced the sensitivity of lending to sentiment and shifted volatility toward risk-based channels. The pandemic period deepens this structural change: confidence shocks became less influential, while default expectations gained prominence, reflecting a post-COVID financial system that prices risk more finely but is structurally more resilient.

The paper proceeds as follows. Section 2 reviews the related literature. Section 3 presents the model economy, describing households, firms, nominal policy, and banks, and incorporating confidence and expected-default shocks. Section 4 outlines the calibration strategy across regimes using U.S. macro-financial data. Section 5 reports impulse responses, variance decompositions, implied second moments, and sensitivity analysis, comparing pre- and post-crisis periods across the GFC and pandemic episodes. Section 6 concludes by discussing policy implications and broader lessons on how confidence and credit jointly shape financial stability over the business cycle.

2 Related Literature

Financial frictions and their role in shaping business cycle dynamics have been studied extensively. Kiyotaki and Moore (1997) and Bernanke et al. (1999) demonstrated how collateral constraints and balance-sheet effects can amplify productivity shocks into broad macroeconomic fluctuations. Subsequent work incorporated explicit financial intermediation, showing how intermediary leverage, working-capital requirements, and credit-market imperfections propagate shocks to real activity (Neumeyer and Perri, 2005; Gertler and Kiyotaki, 2010; Gertler and Karadi, 2011; Quadrini and Perri, 2011). Empirical studies have confirmed the central role of the credit channel: Gilchrist and Zakrajšek (2012) link widening credit spreads to deteriorating borrower fundamentals and intermediary constraints, while Adrian and Shin (2010) document how fluctuations in bank leverage magnify asset-price cycles. These contributions highlight that movements in credit conditions are a key source of macroeconomic volatility, particularly during financial crises.

A parallel strand of research emphasizes the role of beliefs, news, and confidence in driving fluctuations. News-shock models (Beaudry and Portier, 2006; Blanchard et al., 2013) and empirical work on confidence shocks (Barsky and Sims, 2012; Bachmann et al., 2013) show that changes in expectations, rather than in fundamentals, can generate business-cycle dynamics. These studies find that innovations in household and firm sentiment indices account for a nontrivial share of output and investment volatility, often acting through anticipatory demand and valuation channels. Related work on uncertainty and risk shocks (Bloom, 2009; Christiano et al., 2014; Basu and Bundick, 2017) shows that perceived risk can similarly affect spending and financing costs through precautionary behavior and higher risk premia. These findings suggest that shifts in confidence and risk perceptions can play an independent role in shaping credit and macroeconomic outcomes.

The interaction between financial frictions and confidence has received less attention in general equilibrium settings. Jermann and Quadrini (2012) and Gertler and Karadi (2011) incorporate financial intermediaries subject to leverage constraints, showing that credit shocks generate output, investment, and spread fluctuations similar to those observed during crises. Garín (2015) integrates borrowing constraints with search frictions, illustrating that financial shocks influence employment and wage bargaining through the firm's financing position. Most of these frameworks, however,

treat sentiment implicitly, via productivity expectations or collateral values, rather than modeling confidence as a distinct shock. Moreover, they do not differentiate between household and firm confidence, nor do they examine how the strength of these channels evolves under changing regulatory or policy regimes.

Empirical evidence since the Global Financial Crisis points to a structural shift in how financial systems transmit shocks. Before 2008, credit and asset price movements were largely sentiment-driven, with optimism compressing spreads and stimulating risk-taking. After the crisis, tighter regulation and central bank backstops muted this amplification mechanism. Adrian et al. (2013) and Gilchrist and Zakrajšek (2012) document that post-crisis spreads became more closely aligned with measured default risk, reflecting a transition from belief-based to risk-based credit dynamics. During the COVID-19 pandemic, large fiscal transfers and emergency lending programs further reinforced this pattern: sentiment fluctuations had smaller real effects, while risk perceptions became the dominant driver of credit pricing and intermediation behavior (Guerrieri et al., 2022; Hanson et al., 2020; Chetty et al., 2020; He and Krishnamurthy, 2020; Haddad et al., 2021). These developments underscore the importance of studying confidence and default-expectation transmission not only within a single regime but across regimes characterized by differing degrees of policy support and financial resilience.

Our work connects to Christiano et al. (2014), who study risk shocks in a medium-scale New Keynesian DSGE model with financial frictions and find them to be the most important driver of business cycles. Our expected-default channel plays an analogous role in a more parsimonious framework, while extending the analysis to compare transmission across distinct financial regimes. More broadly, our framework also relates to the literature on macroprudential policy and the welfare costs of financial crises: Bianchi (2011) shows how credit externalities can justify regulatory intervention, while Guerrieri et al. (2022) analyze the interaction of fiscal transfers and credit supply during the pandemic. Our framework provides a tractable setting for evaluating how backstop intensity affects credit volatility; however, a full welfare analysis with heterogeneous agents and occasionally binding constraints remains an important direction for future research.

This paper fills this gap by developing a regime-dependent DSGE framework in which consumer and business confidence shocks enter the banking sector through a structural funding wedge, while an expected-default process generates realized loan losses that erode bank net worth. Unlike existing frameworks that treat sentiment implicitly or study a single financial regime, we calibrate the model across four periods surrounding the GFC and the COVID-19 pandemic, documenting how the relative importance of confidence and default channels shifts with the regulatory and policy environment.

3 Model Economy

The model is a DSGE framework with a banking intermediation block, two sentiment channels (consumer and business confidence), an expected-default process, a nominal policy block, and an asset-side risk channel in which expected-default disturbances generate realized loan losses on bank balance sheets. The framework remains parsimonious while linking confidence, monetary policy, and credit risk to lending dynamics across regimes.

3.1 Preferences and Consumer Confidence

A representative household has preferences

$$\max_{\{c_t, n_t, D_t\}_{t\geq 0}} \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \, e_t^C \left[\frac{c_t^{1-\sigma}}{1-\sigma} - \chi \frac{n_t^{1+\eta}}{1+\eta} \right], \qquad e_t^C \equiv \exp(\phi_c \, conf_t^C),$$

subject to the real period budget constraint

$$c_t + D_t \;=\; w_t n_t \;+\; (1 + r_t^d)\, D_{t-1} \;+\; \Pi_t^F \;+\; \Pi_t^B \;-\; T_t,$$

where D_t are (real) deposits placed at banks, r_t^d is the real deposit rate between $t-1$ and t, w_t is the real wage, Π_t^F and Π_t^B are lump-sum firm and bank profits rebated to households, and T_t are lump-sum taxes/transfers. The household takes prices, profits, and transfers as given. The term $e_t^C = \exp(\phi_c \, conf_t^C)$ is a preference shifter that enters the utility function multiplicatively.[1]

Let $U_{c,t} \equiv \varepsilon_t^C c_t^{-\sigma}$ and $U_{n,t} \equiv \varepsilon_t^C \chi n_t^{\eta}$. The first-order conditions are:
Intratemporal labor supply

$$U_{n,t} = U_{c,t}\, w_t \quad \Longleftrightarrow \quad \chi n_t^{\eta} = w_t c_t^{-\sigma}. \tag{3.1}$$

Euler for deposits:

$$U_{c,t} = \beta \, \mathbb{E}_t \left[U_{c,t+1} \, (1 + r_{t+1}^d) \right] \quad \Longleftrightarrow \quad 1 = \beta \, \mathbb{E}_t \left[\underbrace{\frac{\varepsilon_{t+1}^C}{\varepsilon_t^C} \left(\frac{c_{t+1}}{c_t} \right)^{-\sigma}}_{\equiv m_{t,t+1}} (1 + r_{t+1}^d) \right], \tag{3.2}$$

where $m_{t,t+1}$ is the household stochastic discount factor. Note that ε_t^C cancels from the static labor condition (3.1) but affects intertemporal trade-offs through $\varepsilon_{t+1}^C / \varepsilon_t^C$ in (3.2).

[1] Higher $conf_t^C$ increases the marginal utility of consumption relative to leisure, leading households to consume more and supply less precautionary saving. In equilibrium, this generates stronger demand for consumer credit and deposits that enhance banks' funding base.

3.2 Production, Investment, and Business Confidence

A representative competitive firm produces

$$y_t = A_t\, k_t^{\alpha} n_t^{1-\alpha}, \qquad A_t \ \text{ exogenous.}$$

Capital accumulates with quadratic adjustment costs:

$$k_{t+1} = (1-\delta)k_t + i_t, \qquad \text{and} \qquad \Phi(i_t, k_t) = \frac{\varphi}{2}\left(\frac{i_t}{k_t} - \delta\right)^2 k_t.$$

Let business confidence, ζ_t, raise installation efficiency by scaling adjustment costs:

$$\Phi(i_t, k_t) \ \mapsto \ \frac{\varphi}{2\,\zeta_t}\Big(\frac{i_t}{k_t} - \delta\Big)^2 k_t, \qquad \zeta_t \equiv \exp(\psi_i\, conf_t^B).$$

Let q_t denote the shadow value of installed capital. Then,

$$\frac{\partial \Phi}{\partial i_t} = \frac{\varphi}{\zeta_t}\Big(\frac{i_t}{k_t} - \delta\Big)$$

Firms rent capital and hire labor in competitive factor markets, paying R_t^k and w_t. They finance i_t with internal funds F_t (retained earnings) and bank loans L_t:

$$i_t \ = \ F_t + L_t^d, \qquad L_t^d \equiv \text{(firm) loan demand.}$$

Profit maximization implies

$$w_t = (1-\alpha)\, A_t \left(\frac{k_t}{n_t}\right)^{\alpha}, \tag{3.3}$$

$$R_t^k = \alpha\, A_t \left(\frac{n_t}{k_t}\right)^{1-\alpha}. \tag{3.4}$$

With households as owners, the SDF $m_{t,t+1}$ prices firm cash flows. When firms finance investment partly through bank credit, the effective cost of capital includes an external finance premium (EFP) that reflects prevailing credit conditions:

$$efp_t \ = \ \chi_{efp}\,(s_t - \bar{\mu}), \tag{3.5}$$

where $\chi_{efp} > 0$ governs the sensitivity of the EFP to deviations of the loan-deposit spread from its steady-state value $\bar{\mu}$. When spreads widen, the EFP rises, increasing the effective cost of external

finance for firms. The capital Euler equation and q-relation are

$$q_t\,(1+efp_t) = \mathbb{E}_t\left[m_{t,t+1}\left(R^k_{t+1} + (1-\delta)\,q_{t+1}\right)\right], \tag{3.6}$$

$$q_t = 1 + \frac{\varphi}{\zeta_t}\Big(\frac{i_t}{k_t} - \delta\Big) \tag{3.7}$$

The term $(1+efp_t)$ on the left-hand side of (3.6) drives a wedge between the shadow value of installed capital and the expected discounted return. When credit conditions tighten ($efp_t > 0$), the effective price of capital rises, reducing desired investment and lowering Tobin's q in equilibrium. This creates a direct channel from bank intermediation costs to real investment decisions.

3.3 Nominal Policy

To link monetary conditions to credit intermediation, the real block is augmented with a parsimonious nominal-policy system. Inflation and the policy rate evolve according to

$$\begin{aligned}\pi_t &= \beta\,\mathbb{E}_t[\pi_{t+1}] + \kappa_\pi\, ygap_t,\\ i^{nom}_t &= \rho_i\, i^{nom}_{t-1} + (1-\rho_i)\left[\bar{i} + \phi_\pi(\pi_t - \bar{\pi}) + \phi_y\, ygap_t\right] + \varepsilon^{mp}_t,\end{aligned} \tag{3.8}$$

with the real deposit rate determined by the Fisher mapping

$$1 + r^d_t = \frac{1 + i^{nom}_t}{1 + \mathbb{E}_t[\pi_{t+1}]}. \tag{3.9}$$

The block links policy to the rest of the model through two channels. The Fisher equation feeds monetary conditions into households' intertemporal margin through the deposit rate. Policy-rate surprises affect bank funding conditions directly through the wedge equation below, so monetary shocks influence spreads, lending, and the external finance premium in firms' investment Euler equation.[2]

3.4 Banks

Banks intermediate between households and firms by transforming deposits into loans, subject to balance-sheet and funding constraints. Let NW_t and D_t denote bank net worth and deposits collected at the end of period t. The balance sheet is

$$L_t = D_t + NW_t, \tag{3.10}$$

[2]The output gap $ygap_t \equiv y_t - \bar{y}$ is defined as the deviation from the deterministic steady state rather than from a flexible-price natural-rate benchmark. In a full New Keynesian model with both sticky and flexible-price equilibria, the welfare-relevant gap would be measured relative to the natural rate. The present definition is consistent with the parsimonious nominal block and does not affect the model's core mechanism linking confidence to credit conditions, though it may influence the Taylor rule's stabilization properties.

where L_t is the aggregate loan book. A prudential leverage requirement limits lending to a multiple of equity:

$$L_t \;\leq\; \phi_{bank}\, NW_t, \qquad \phi_{bank} > 0, \tag{3.11}$$

where ϕ_{bank} captures the tightness of regulation and the fragility of banks' balance sheets.

Bank net worth accumulates through retained profits and is affected by asset-price-driven valuation changes. Net-worth dynamics follow

$$NW_{t+1} = \rho_{NW}\, NW_t + \lambda_{\Pi}\, \Pi_t^B \;+\; \xi_{NW}(q_t - 1)\, NW_t,$$

where Π_t^B are bank profits, $\rho_{NW} \in [0, 1)$ is the persistence of net worth (capturing depreciation or dividend payouts), and $\lambda_{\Pi} \in (0, 1]$ is the share of profits retained as equity. The term $\xi_{NW}(q_t - 1)NW_t$ introduces a mark-to-market channel: changes in asset valuations directly affect bank equity through unrealized gains and losses on the loan portfolio. When q_t falls below its steady-state value, bank net worth erodes, tightening the leverage constraint $L_t \leq \phi_{bank} NW_t$ and reducing lending capacity. This mechanism captures the balance-sheet amplification documented in the financial accelerator literature: asset price declines weaken intermediary equity, which contracts credit supply, further depressing investment and asset prices (Bernanke et al., 1999; Gertler and Kiyotaki, 2010).

Banks lend at rate r_t^L and remunerate deposits at rate r_t^d, so the observable spread is

$$s_t \equiv r_t^L - r_t^d. \tag{3.12}$$

The spread reflects intermediation margins, funding conditions, and risk compensation.

Governments and central banks at times deploy liquidity facilities, guarantees, or regulatory forbearance that shield intermediaries from funding stress. We capture such interventions with a reduced-form policy parameter $\kappa_r \in [0, 1]$, which measures the strength of official support to the banking system in regime r. A higher κ_r dampens the sensitivity of funding premia to confidence fluctuations through

$$\gamma_{fund}^{(r)} \equiv s_r\, (1 - \kappa_r)\, \gamma_{fund,0}, \tag{3.13}$$

where $s_r \in \{-1, +1\}$ allows for regime-dependent reversals in the sign of the confidence channel observed in the data. When $\kappa_r = 0$, funding spreads are fully sensitive to sentiment-driven shifts. When $\kappa_r = 1$, they are completely insulated by policy backstops. This decomposition preserves the interpretation of κ_r as the intensity of official support, while the sign parameter s_r captures regime-specific changes in the direction of the confidence-spread relationship, including cases where large-scale interventions flatten or invert funding sensitivities.[3]

[3]We calibrate s_r to match the observed sign of the correlation between confidence innovations and the funding wedge in each regime, allowing the data to determine the direction of this relationship across financial environments.

To separate the drivers of demand and supply, we write the observable loan–deposit spread as

$$s_t = \mu - \omega_t, \tag{3.14}$$

where μ denotes the baseline intermediation margin and ω_t is a funding wedge. To allow asymmetric transmission of confidence shocks, consumer confidence enters the funding side directly, while business confidence enters through a loan-demand pressure index[4]

$$\Lambda_t \equiv \chi_B^{LD}\, conf_t^B + \chi_i^{LD}\Big(\frac{i_t}{k_t} - \delta\Big) + \chi_q^{LD}(q_t - 1). \tag{3.15}$$

The wedge then follows

$$\omega_t = s_r(1-\kappa_r)\gamma_{\text{fund},0}(\gamma_C\, conf_t^C - \gamma_{LD}\Lambda_t) - \theta_{def}^{(r)}\, E_t[d_{t+1}] - \theta_{mp}(i_t^{nom} - \bar{i}). \tag{3.16}$$

Here, γ_C governs the supply-side easing effect of household sentiment on bank funding costs, and γ_{LD} scales the demand-side congestion pressure arising from business-confidence-driven loan demand. The opposing signs reflect the dual nature of the credit market: consumer confidence eases the supply of intermediated funds, whereas business confidence strains intermediary capacity. The monetary pass-through parameter $\theta_{mp} \geq 0$ captures how unexpected policy tightening raises marginal refinancing costs in money and wholesale funding markets. When the nominal rate exceeds its steady-state level, the term $-\theta_{mp}(i_t^{nom} - \bar{i})$ lowers ω_t, widens the spread $s_t = \mu - \omega_t$, and contracts lending.

The expected-default factor d_t follows a stationary AR(1) process,

$$d_t = \rho_{\text{def}}\, d_{t-1} + \sigma_{\text{def}}\, \varepsilon_t^{\text{def}}, \qquad \varepsilon_t^{\text{def}} \sim \mathcal{N}(0,1), \;\; |\rho_{\text{def}}| < 1, \tag{3.17}$$

where d_t is a standardized proxy—such as the charge-off or delinquency rate—and σ_{def} scales the innovation. Under (3.17), $\mathbb{E}_t[d_{t+1}] = \rho_{\text{def}}\, d_t$, implying that the default component in (3.16) enters proportionally to the current state d_t with slope $\theta_{\text{def}}^{(r)}\rho_{\text{def}}$.

To connect expected and realized credit risk, we map the default state into a realized loan-loss rate:

$$\delta_t^L = \bar{\delta}_L \exp(\lambda_{def} d_t), \qquad \bar{\delta}_L > 0, \;\; \lambda_{def} > 0. \tag{3.18}$$

[4] Λ_t captures three jointly procyclical indicators of demand pressure on bank balance-sheet capacity. Business confidence ($conf_t^B$) reflects forward-looking firm sentiment about investment opportunities. Excess investment intensity ($i_t/k_t - \delta$) measures capital accumulation above the steady-state pace, and therefore the direct draw on external financing. The Tobin's Q gap ($q_t - 1$) proxies the perceived return to installed capital relative to its replacement cost; when $q_t > 1$, firms find expansion profitable and accordingly increase borrowing demand. Because all three components tend to rise together during investment booms, Λ_t provides a compact summary of the demand-side strain on intermediary capacity that enters the funding wedge through the congestion channel.

Given $(\mu, \omega_t, r_t^d, NW_t)$ and realized default-loss rate δ_t^L, one-period bank profits are

$$\begin{aligned}\Pi_t^B &= r_t^L L_t - r_t^d D_t - \mathcal{C}(L_t) - \delta_t^L L_t \\ &= (r_t^L - r_t^d) L_t + r_t^d NW_t - \mathcal{C}(L_t) - \delta_t^L L_t \\ &= (\mu - \omega_t) L_t + r_t^d NW_t - \mathcal{C}(L_t) - \delta_t^L L_t, \end{aligned} \tag{3.19}$$

where $\mathcal{C}(L_t)$ are convex intermediation costs using real resources ($\mathcal{C}'(L) > 0$, $\mathcal{C}''(L) \geq 0$). The term $r_t^d NW_t$ is predetermined and does not affect the loan choice. We treat δ_t^L as an ex-post realized balance-sheet loss, so it primarily affects net-worth accumulation rather than contemporaneous loan choice.

The bank chooses L_t subject to (3.11). The Lagrangian is

$$\mathcal{L} = (\mu - \omega_t) L_t + r_t^d NW_t - \mathcal{C}(L_t) + \lambda_t^{BK}(\phi_{bank} NW_t - L_t),$$

with multiplier $\lambda_t^{BK} \geq 0$.

The Kuhn–Tucker conditions are

$$(\mu - \omega_t) - \mathcal{C}'(L_t) - \lambda_t^{BK} = 0, \tag{3.20}$$

$$\lambda_t^{BK} \geq 0, \qquad \lambda_t^{BK}(\phi_{bank} NW_t - L_t) = 0, \qquad 0 \leq L_t \leq \phi_{bank} NW_t. \tag{3.21}$$

If the leverage constraint is slack ($\lambda_t^{BK} = 0$), optimal lending equates the margin net of the funding wedge to marginal costs, augmented by a collateral-value term:

$$\mu - \omega_t \; + \; \kappa_{col}(q_t - 1) = \mathcal{C}'(L_t). \tag{3.22}$$

The parameter $\kappa_{col} \geq 0$ captures the sensitivity of loan supply to the market value of borrower collateral. When asset prices exceed their steady-state level ($q_t > 1$), the effective intermediation margin rises, expanding credit supply. Conversely, when q_t falls below one, as occurs when adverse shocks depress investment and capital valuations, collateral deteriorates, reducing the effective margin and contracting lending. This collateral channel creates a direct feedback from real asset prices to bank credit supply, reinforcing the financial accelerator mechanism. In steady state, $q = 1$ and the collateral term vanishes, preserving the baseline calibration. Holding collateral and bank equity fixed, tighter funding conditions contract lending.

If the constraint binds, $L_t = \phi_{bank} NW_t$ and (3.20) determines the shadow cost λ_t^{BK}. In this case, lending is pinned by bank equity. If $\mathcal{C}(L) = \frac{\kappa_L}{2} L^2$, the interior solution is $L_t^{\text{int}} = [\mu - \omega_t + \kappa_{col}(q_t - 1)]/\kappa_L$, and loan supply is

$$L_t^s = \max\Big\{0, \; \min\Big[\frac{\mu - \omega_t \; + \; \kappa_{col}(q_t - 1)}{\kappa_L}, \; \phi_{\text{bank}} NW_t\Big]\Big\}. \tag{3.23}$$

The interior solution applies only when $\mu - \omega_t \geq 0$; otherwise the non-negativity constraint binds and $L_t = 0$. The expression above therefore implements both the leverage cap and the Kuhn–Tucker condition $L_t \geq 0$.

Before turning to the aggregate comparative statics, we isolate how confidence shocks affect lending through the bank's funding and investment channels. The next two lemmas summarize these partial-equilibrium mechanisms.

Lemma 1 *Suppose $\phi_c > 0$, $C''(L_t) > 0$ and $s_r(1-\kappa_r)\gamma_{fund,0}\gamma_C < 0$. Then a positive innovation to consumer confidence $conf_t^C$ increases equilibrium loans L_t in the interior region.*

Lemma 2 *Suppose $\psi_i > 0$, $C''(L_t) > 0$, and $s_r(1-\kappa_r)\gamma_{fund,0}\gamma_{LD}\chi_B^{LD} < 0$. Then a positive innovation to business confidence $conf_t^B$ increases equilibrium loans L_t in the interior region through the loan-demand-pressure channel.*

Proposition 1 (Comparative statics of loan supply) *Assume $\mathcal{C}(\cdot)$ is convex with $\mathcal{C}'(L) > 0$ and $\mathcal{C}''(L) \geq 0$, and consider the bank problem in (3.19)–(3.23).*

1. ***(Interior region)*** *If the leverage constraint is slack so that $\mu - \omega_t = \mathcal{C}'(L_t)$, then, consistent with Lemma 1 and Lemma 2,*

$$\frac{\partial L_t}{\partial \kappa_r} = -\frac{1}{\mathcal{C}''(L_t)}\frac{\partial \omega_t}{\partial \kappa_r} = -\frac{1}{\mathcal{C}''(L_t)}\left[-s_r\gamma_{fund,0}(\gamma_C\, conf_t^C - \gamma_{LD}\Lambda_t)\right] = \frac{s_r\gamma_{fund,0}(\gamma_C\, conf_t^C - \gamma_{LD}\Lambda_t)}{\mathcal{C}''(L_t)}.$$

   This expression is nonnegative whenever $\gamma_C\, conf_t^C - \gamma_{LD}\Lambda_t \leq 0$, that is, when the economy is in a low-confidence state. Hence a larger backstop (κ_r) raises lending by reducing the effective spread.

2. ***(Cap-binding region)*** *If the leverage constraint binds, $L_t = \phi_{bank} NW_t$, then*

$$\frac{\partial L_t}{\partial NW_t} = \phi_{bank} > 0, \qquad \frac{\partial L_t}{\partial \phi_{bank}} = NW_t > 0, \qquad \frac{\partial L_t}{\partial \mu} = \frac{\partial L_t}{\partial \omega_t} = 0.$$

   When the cap binds, lending is pinned by bank equity and regulation; pricing wedges (μ, ω_t) do not affect L_t contemporaneously.

All proofs are in the Appendix.

Proposition 2 (Financial accelerator) *Suppose $\chi_{efp} > 0$, $\kappa_{col} > 0$, and $\xi_{NW} > 0$. An adverse confidence shock ($\Delta conf_t^C < 0$ or $\Delta conf_t^B < 0$) triggers a mutually reinforcing contraction through three channels:*

1. ***(EFP channel)*** *The funding wedge falls, widening the spread s_t and raising the external finance premium $efp_t = \chi_{efp}(s_t - \bar{\mu})$. By (3.6), higher efp_t reduces q_t and depresses investment.*

2. ***(Collateral channel)*** *Lower q_t reduces the collateral term $\kappa_{col}(q_t - 1)$ in (3.22), contracting loan supply beyond the direct effect of the funding wedge.*

3. ***(Balance-sheet channel)*** *Lower q_t reduces bank net worth through $\xi_{NW}(q_t - 1)NW_t$, tightening the leverage constraint and further restricting lending capacity.*

The three channels form a feedback loop: tighter credit conditions depress asset prices, which erode collateral values and bank equity, which further tighten credit conditions. The strength of amplification increases with χ_{efp}, κ_{col}, and ξ_{NW}. When backstop intensity κ_r is high, the initial movement in ω_t and s_t is smaller, dampening the entire amplification chain.

3.5 Market Clearing and Exogenous Processes

With a single homogeneous good, aggregate resource feasibility is

$$y_t \;=\; c_t \;+\; i_t \;+\; \Phi(i_t, k_t) \;+\; \mathcal{C}(L_t),$$

where $\Phi(i_t, k_t)$ are capital adjustment costs and $\mathcal{C}(L_t)$ are real intermediation or monitoring costs. Government spending and transfers are omitted in the baseline ($g_t \equiv 0$).

Factor markets are competitive and clear:

$$n_t^{HH} = n_t^F \equiv n_t, \qquad k_t^{HH} = k_t^F \equiv k_t, \qquad k_{t+1} = (1-\delta)k_t + i_t.$$

Banking markets and balance sheets also clear:

$$L_t^d = L_t^s \equiv L_t, \qquad D_t^{HH} = D_t^{BK} \equiv D_t, \qquad L_t = D_t + NW_t, \qquad 0 \le L_t \le \phi_{bank} NW_t.$$

Aggregate technology and sentiment follow AR(1) processes:

$$\begin{aligned} \log A_t &= (1-\rho_A)\bar{a} + \rho_A \log A_{t-1} + \varepsilon_t^A, \\ conf_t^C &= \rho_C \, conf_{t-1}^C + \varepsilon_t^C, \\ conf_t^B &= \rho_B \, conf_{t-1}^B + \varepsilon_t^B, \end{aligned}$$

with innovations $\varepsilon_t^x \sim \mathcal{N}(0, \sigma_x^2)$ for $x \in \{A, C, B\}$. Business confidence scales installation efficiency in adjustment costs:

$$\log \zeta_t = \psi_i \, conf_t^B, \qquad \Phi(i_t, k_t) = \frac{\varphi}{2\,\zeta_t}\Big(\frac{i_t}{k_t} - \delta\Big)^2 k_t.$$

The expected-default factor d_t also evolves as a stationary AR(1):

$$d_t \;=\; \rho_{\text{def}}\, d_{t-1} \;+\; \sigma_{\text{def}}\, \varepsilon_t^{\text{def}}, \qquad \varepsilon_t^{\text{def}} \sim \mathcal{N}(0,1), \;\; |\rho_{\text{def}}| < 1,$$

The nominal-policy block is given by

$$\begin{aligned} ygap_t &\equiv y_t - \bar{y}, \\ \pi_t &= \beta\, \mathbb{E}_t[\pi_{t+1}] + \kappa_\pi\, ygap_t, \\ i_t^{nom} &= \rho_i\, i_{t-1}^{nom} + (1-\rho_i)[\bar{i} + \phi_\pi(\pi_t - \bar{\pi}) + \phi_y\, ygap_t] + \varepsilon_t^{mp}, \\ 1 + r_t^d &= \frac{1 + i_t^{nom}}{1 + \mathbb{E}_t[\pi_{t+1}]}, \end{aligned}$$

where π_t is inflation, i_t^{nom} is the policy rate, and ε_t^{mp} is a monetary-policy shock.

Realized loan losses follow

$$\delta_t^L = \bar{\delta}_L \exp(\lambda_{def} d_t).$$

Loan-demand pressure is summarized by

$$\Lambda_t = \chi_B^{LD}\, conf_t^B + \chi_i^{LD}\Big(\frac{i_t}{k_t} - \delta\Big) + \chi_q^{LD}(q_t - 1).$$

Policy support is summarized by a backstop intensity $\kappa_r \in [0,1]$, which dampens the sensitivity of funding premia to confidence shocks:

$$\gamma_{fund}(\kappa_r) \;\equiv\; (1-\kappa_r)\,\gamma_{fund,0}.$$

The observed loan–deposit spread is

$$s_t \;\equiv\; r_t^L - r_t^d \;=\; \mu \;-\; \omega_t,$$

and funding wedge ω_t is

$$\omega_t \;=\; s_r(1-\kappa_r)\,\gamma_{fund,0}\,(\gamma_C\, conf_t^C - \gamma_{LD}\Lambda_t) \;-\; \theta_{def}^{(r)}\,\mathbb{E}_t[d_{t+1}] \;-\; \theta_{mp}(i_t^{nom} - \bar{i})$$

4 Quantitative Calibration

To discipline the model with U.S. data, we calibrate parameters to long-run averages and period-specific financial indicators, distinguishing between the pre- and post-crisis environments. The time unit is one quarter. Across all regimes, the household discount factor is set at $\beta = 0.99$, implying a steady-state annual real interest rate of roughly four percent. The utility curvature σ is fixed at two, while the Frisch elasticity of labor supply is set to 0.5 ($\eta = 2$), consistent with standard RBC calibrations. The disutility parameter χ is chosen such that steady-state hours equal one third of available time. On the production side, the capital share is fixed at $\alpha = 0.36$ and depreciation at $\delta = 0.025$ per quarter. The steady-state investment-to-output ratio $I/Y \approx 0.20$ follows from the

Euler condition and the depreciation rate, while the adjustment-cost parameter is set to $\varphi = 2$ to generate realistic investment dynamics around the steady state. Productivity follows an AR(1) with persistence $\rho_A = 0.95$.

Turning to preferences and sentiment, the consumer confidence elasticity ϕ_c is calibrated to reproduce the empirical response of household consumption growth to innovations in survey-based confidence indices, drawing on estimates in Carroll et al. (1994) and Bachmann et al. (2013). For business sentiment, the parameter ψ_i governing installation efficiency is chosen such that a one-standard-deviation innovation to $conf_t^B$ generates an investment response consistent with the impulse responses reported in Barsky and Sims (2012).

For the asymmetric confidence block, we normalize the direct funding loading to $\gamma_C = 1$ and set $\gamma_{LD} = 0.45$ so that business-confidence effects on the funding wedge are weaker than consumer-confidence effects on deposit-side funding conditions, consistent with reduced-form evidence that household sentiment loads more strongly on funding conditions than firm sentiment. The components of the loan-demand pressure index are set to $\chi_B^{LD} = \chi_i^{LD} = \chi_q^{LD} = 1$ as a baseline normalization: business confidence, investment intensity, and collateral valuation each contribute proportionally to short-run demand pressure. These values are validated by the model-implied asymmetry in impulse responses and variance shares between ε^C and ε^B, yielding a decomposition that the symmetric specification cannot produce. For the monetary pass-through term, we set $\theta_{mp} = 0.10$ to match an impact semi-elasticity in which a 100-basis-point policy-rate surprise shifts the funding wedge by about 10 basis points on impact, consistent with moderate short-run pass-through from policy rates to bank funding costs.[5]

We first contrast the U.S. economy before and after the Great Financial Crisis. In the pre-GFC period (2000Q1–2007Q2), the average intermediation margin μ implied by the prime–Treasury spread corresponds to roughly 290 basis points annually, while the loan-to-output ratio L/Y averaged about 0.34. Consumer and business confidence processes are calibrated using survey indices, with persistence estimates $\rho_C \approx 0.90$ and $\rho_B \approx 0.90$. After the crisis (2009Q1–2014Q4), spreads widened modestly to about 300 basis points annually, and the loan-to-output ratio rose slightly to 0.35, reflecting subdued GDP but resilient credit volumes. Sentiment series also display higher persistence, with $\rho_C \approx 0.93$ and $\rho_B \approx 0.94$. These shifts are embedded in the calibration by toggling between the two regimes, thereby allowing the model to capture changes in financial frictions and sentiment propagation associated with the crisis.

We next examine the shift around the COVID-19 pandemic. In the pre-pandemic expansion (2015Q1–2019Q4), intermediation margins averaged about 260 basis points annually, and the loan-

[5]This calibration is consistent with estimates from the empirical pass-through literature. Studies of bank funding costs document that a 100-basis-point increase in the federal funds rate raises short-term wholesale funding costs by approximately 10–20 basis points on impact, with the remainder transmitted over subsequent quarters as term funding rolls over (Gilchrist and Zakrajšek, 2012; Adrian et al., 2013). The modest impact elasticity reflects the fact that a large share of bank liabilities are fixed-rate or sluggishly repriced deposits, so that only the marginal wholesale component responds contemporaneously to policy-rate changes.

to-output ratio remained stable near 0.36. Confidence indices exhibited persistence close to 0.90, consistent with medium-run survey dynamics. In the post-pandemic environment (2020Q2–2023Q4), spreads widened in the early quarters before stabilizing, delivering an average margin of roughly 310 basis points annually. The loan-to-output ratio temporarily spiked above 0.38 amid weak GDP and policy-driven credit expansion. Confidence persistence rose as well, with $\rho_C \approx 0.94$ and $\rho_B \approx 0.95$, consistent with more sluggish recovery in sentiment. These targets, estimated from U.S. data, discipline the calibration and allow us to evaluate how the crisis and policy response altered the strength of the confidence–credit channel.

In addition, the sensitivity of funding costs to expected default risk, captured by θ_{def}, is calibrated using U.S. commercial bank charge-off data on commercial and industrial (C&I) loans from the Federal Reserve's Charge-Off and Delinquency Rate series. Quarterly regressions of the estimated funding wedge on standardized charge-off rates yield $\theta_{\text{def}}^{\text{pre-GFC}} = 1.2 \times 10^{-4}$ and $\rho_{\text{def}}^{\text{pre-GFC}} \approx 0.92$, while the post-GFC estimates indicate $\theta_{\text{def}}^{\text{post-GFC}} = 0.8 \times 10^{-4}$ and $\rho_{\text{def}}^{\text{post-GFC}} \approx 0.97$. After controlling for the monetary-policy pass-through term $\theta_{mp}(i_t^{nom} - \bar{i})$, the post-crisis default sensitivity remains positive but is attenuated. The smaller post-GFC coefficient reflects the combined effect of enhanced regulation, improved bank capitalization, and active liquidity facilities, which dampened the transmission of default expectations to wholesale funding premia without reversing the sign of the relationship. For the pandemic comparison, the estimates imply $\theta_{\text{def}}^{\text{pre-Pandemic}} = 1.3 \times 10^{-4}$ and $\theta_{\text{def}}^{\text{post-Pandemic}} = 3.8 \times 10^{-4}$, indicating a reemergence of positive sensitivity as temporary policy supports unwound. These values allow the model to capture the changing relationship between perceived default risk and interbank funding premia across regimes.

For both crises, the convexity of intermediation costs, κ_L, is calibrated once and kept constant across all regimes. In steady state, the bank's interior condition implies $\mu = \kappa_L \bar{L}$, so we discipline κ_L using the broad private credit-to-output ratio (approximately 0.80) together with the targeted intermediation margin μ. This yields $\kappa_L = 0.0063$. The narrower loan-to-output ratios reported in Table 2 (0.34–0.43) correspond to commercial and industrial (C&I) lending and are model outcomes, not calibration targets. They differ from the broad ratio because the bank operates under a binding leverage constraint in steady state rather than the interior condition $L = \mu/\kappa_L$.

In addition to regime-specific structural parameters, we allow the volatility of exogenous innovations to vary across regimes. The standard deviation of confidence survey indices was substantially larger in the pre-crisis periods than in the post-crisis recoveries, when sentiment exhibited sluggish, persistent dynamics rather than large quarter-to-quarter swings. Conversely, credit-risk indicators such as charge-off and delinquency rates displayed greater volatility in the post-crisis periods, reflecting both the direct impact of crisis-era defaults and the subsequent deleveraging process. We therefore calibrate higher confidence-shock standard deviations ($\sigma_C = \sigma_B = 0.020$) in the pre-GFC regime and lower values ($\sigma_C = \sigma_B = 0.008$) in the post-GFC regime, with analogous adjustments for the pandemic comparison (0.018 versus 0.010). Default-shock volatility is calibrated in the opposite direction: lower pre-crisis ($\sigma_{def} = 0.5$) and higher post-crisis ($\sigma_{def} = 2.0$ for the

GFC, 1.5 for the pandemic). Technology and monetary-policy shock volatilities also adjust modestly to reflect the lower macroeconomic volatility of the pre-2007 Great Moderation period relative to the more turbulent post-crisis recoveries.

Bank leverage is set at eight, corresponding to an equity-to-asset ratio of about twelve and a half percent, consistent with U.S. regulatory benchmarks. The net-worth persistence parameter ρ_{NW} governs the gradual adjustment of bank equity, and the retention share λ_{Π} is fixed at 0.75, consistent with evidence that banks retain a substantial fraction of earnings to rebuild capital buffers. The funding-wedge sensitivity $\gamma_{fund,0} = 0.05$ is calibrated so that a one-standard-deviation decline in aggregate confidence widens the intermediation spread by approximately five basis points per quarter, consistent with the empirical response of credit spreads to sentiment innovations in Gilchrist and Zakrajšek (2012). The external finance premium sensitivity $\chi_{efp} = 5$ then translates spread movements into an effective cost of capital, implying a pass-through elasticity within the range estimated by Christiano et al. (2014). Finally, the backstop intensity parameter κ_r is anchored by policy data: in the pre-crisis regimes we set $\kappa_r = 0$, reflecting the absence of extraordinary liquidity facilities, while the implied values rise to $\kappa_{\text{post-GFC}} \simeq 0.91$ and $\kappa_{\text{post-PAN}} \simeq 0.69$ during the Federal Reserve's large-scale interventions following the GFC and the COVID-19 pandemic. These calibrations imply that funding premia became increasingly insulated from confidence shocks as policy backstops strengthened.[6]

[6]To evaluate whether regime differences reflect genuine instability in reduced-form transmission, we estimate a common wedge equation on simulated pre/post samples and compute Chow and SupF (single-break scan) statistics. In the GFC comparison, Chow $F = 339.49$ ($p < 0.001$) and SupF = 1129.74; in the pandemic comparison, Chow $F = 311.77$ ($p < 0.001$) and SupF = 1101.17. These diagnostics support regime-dependent coefficients in the funding-wedge relationship.

Table 1: Common structural parameters (quarterly).

Object	Symbol	Value	Target / Rationale
Discount factor	β	0.99	$\bar{r}^d \approx 1\%$ per quarter
Risk aversion	σ	2	Standard CRRA
Inverse Frisch elasticity	η	2	Frisch elasticity = 0.5
Labor disutility weight	χ	Calibrated	$n = 1/3$ steady state
Capital share	α	0.36	National income shares
Depreciation rate	δ	0.025	10% annual depreciation
Adj. cost scale	φ	2	Matches $I/Y \approx 0.20$
Intermediation cost curvature	κ_L	0.0063	Matches steady-state L/Y ratio
Net-worth persistence	ρ_{NW}	0.98	Slow-moving bank equity
Profit retention share	λ_Π	0.75	Bank payout ratio
Consumer confidence load	ϕ_c	0.02	Consumption–confidence elasticity
Business confidence load	ψ_i	0.05	Investment–confidence elasticity via ζ
Technology persistence	ρ_A	0.95	Output persistence
Monetary-policy inertia	ρ_i	0.80	Interest-rate smoothing
Taylor inflation weight	ϕ_π	1.50	Inflation stabilization
Taylor output-gap weight	ϕ_y	0.125	Real-activity stabilization
NKPC slope	κ_π	0.08	Price-adjustment elasticity
Policy pass-through to wedge	θ_{mp}	0.10	Policy-rate effect on funding costs
Steady-state loss rate	$\bar{\delta}_L$	0.0020	Baseline realized loan losses
Loss elasticity to default state	λ_{def}	0.25	Default-state sensitivity of losses
Funding sensitivity scale	$\gamma_{fund,0}$	0.05	1 s.d. confidence drop $\Rightarrow \approx$5 bps spread widening
Consumer-confidence funding loading	γ_C	1.00	Normalization: supply-side easing channel
Loan-demand congestion pass-through	γ_{LD}	0.45	Demand-side congestion on bank capacity
Business-confidence demand loading	χ_B^{LD}	1.00	Firm-sentiment contribution to demand pressure
Investment-intensity demand loading	χ_i^{LD}	1.00	Investment-pressure contribution
Collateral-value demand loading	χ_q^{LD}	1.00	Tobin-q pressure contribution
EFP sensitivity	χ_{efp}	5	Spread–EFP elasticity
Collateral sensitivity	κ_{col}	0.10	Asset-price–lending feedback
Mark-to-market sensitivity	ξ_{NW}	0.50	Bank equity–asset price link

Table 2: Regime-specific calibration: financial and default-channel parameters (quarterly).

Object	Symbol	Value	Target / Rationale	Regime
Financial and confidence parameters				
Intermediation margin	μ	0.0073	Prime–Treasury spread	Pre-GFC
		0.0075	Prime–Treasury spread	Post-GFC
		0.0073	Prime–Treasury spread	Pre-Pandemic
		0.0071	Prime–Treasury spread	Post-Pandemic
Loan-to-output ratio	L/Y	0.34	Credit-to-GDP	Pre-GFC
		0.35	Credit-to-GDP	Post-GFC
		0.43	Credit-to-GDP	Pre-Pandemic
		0.43	Credit-to-GDP	Post-Pandemic
Consumer confidence persistence	ρ_C	0.90	U. Michigan survey AR(1)	Pre-GFC
		0.93	U. Michigan survey AR(1)	Post-GFC
		0.90	U. Michigan survey AR(1)	Pre-Pandemic
		0.94	U. Michigan survey AR(1)	Post-Pandemic
Business confidence persistence	ρ_B	0.90	NFIB AR(1)	Pre-GFC
		0.94	NFIB AR(1)	Post-GFC
		0.90	NFIB AR(1)	Pre-Pandemic
		0.95	NFIB AR(1)	Post-Pandemic
Expected-default channel				
Expected-default sensitivity	θ_{def}	0.00012	Charge-off regression	Pre-GFC
		-0.00031	Charge-off regression	Post-GFC
		0.00013	Charge-off regression	Pre-Pandemic
		0.00038	Charge-off regression	Post-Pandemic
Expected-default persistence	ρ_{def}	0.92	AR(1) on charge-off data	Pre-GFC
		0.97	AR(1) on charge-off data	Post-GFC
		0.65	AR(1) on charge-off data	Pre-Pandemic
		0.76	AR(1) on charge-off data	Post-Pandemic

Table 3: Regime-specific calibration: policy backstops and shock volatilities (quarterly).

Object	Symbol	Value	Target / Rationale	Regime
Policy and backstop parameters				
Backstop intensity	κ_r	0.00	No extraordinary support	Pre-periods
		0.91	Fed facilities and guarantees	Post-GFC
		0.69	Pandemic credit backstops	Post-Pandemic
Policy sensitivity sign	s_r	$\{+1, -1\}$	Regime-specific direction	All
Shock standard deviations				
Consumer confidence	σ_C	0.020	Survey index volatility	Pre-GFC
		0.008	Survey index volatility	Post-GFC
		0.018	Survey index volatility	Pre-Pandemic
		0.010	Survey index volatility	Post-Pandemic
Business confidence	σ_B	0.020	NFIB survey volatility	Pre-GFC
		0.008	NFIB survey volatility	Post-GFC
		0.018	NFIB survey volatility	Pre-Pandemic
		0.010	NFIB survey volatility	Post-Pandemic
Default shock	σ_{def}	0.50	Charge-off volatility	Pre-GFC
		2.00	Charge-off volatility	Post-GFC
		0.40	Charge-off volatility	Pre-Pandemic
		1.50	Charge-off volatility	Post-Pandemic

5 Quantitative Analysis

5.1 Impulse Responses Across the Pre- and Post-GFC

Figures 1 to 3 present impulse responses to one-standard-deviation consumer-confidence, business-confidence, and expected-default shocks across the pre- and post-GFC regimes.

An adverse consumer-confidence shock transmits through the household's intertemporal margin, as shown in Figure 1. In the pre-GFC regime, consumption initially rises as falling sentiment reduces the marginal utility of current consumption relative to future consumption, inducing intertemporal substitution toward the present. Over the medium horizon, however, the contraction in investment and capital accumulation pulls output downward. The funding wedge falls sharply on impact, widening loan-deposit spreads and raising the external finance premium. The higher premium depresses investment demand and produces a pronounced decline in bank lending. Net worth falls as intermediary profits contract, reinforcing the credit contraction through the balance-sheet

channel. In the post-GFC regime, the strong policy backstop nearly eliminates the funding-wedge response. Spreads barely move, the finance premium is nearly flat, and loan dynamics are negligible, consistent with evidence that sentiment shocks propagate most forcefully when intermediary balance sheets are elastic and leverage constraints are slack (Barsky and Sims, 2012; Bachmann et al., 2013).

Business confidence operates through a different channel than consumer confidence, as Figure 2 illustrates. Lower business confidence reduces loan-demand pressure, and because this pressure enters the funding wedge with a negative sign, the decline in demand pressure raises the wedge, narrows spreads, and lowers the external finance premium. In the pre-GFC regime, this spread compression is the dominant short-run channel, allowing loans to rise initially even as business sentiment weakens. Asset prices also rise on impact because lower installation efficiency raises the marginal adjustment cost for a given investment rate. Over the medium horizon, the real effects of weaker business confidence, notably lower investment demand and declining output, dominate. Loans, net worth, and asset prices gradually fall, and consumption declines as lower output and investment reduce household income. In the post-GFC regime, the backstop largely shuts down the funding-wedge channel, and all responses are small and short-lived (Jermann and Quadrini, 2012; Adrian et al., 2013).

The expected-default channel produces a qualitatively distinct pattern from both confidence channels (Figure 3). In the pre-GFC regime, the shock has small effects. The funding wedge barely moves, spreads are nearly unchanged, and lending and real activity respond negligibly, consistent with the small pre-GFC default sensitivity. Net worth declines modestly as higher realized losses erode bank equity. In the post-GFC regime, the responses are larger and qualitatively different. The negative post-GFC default sensitivity, which reflects the strong policy insulation of funding costs from default expectations, implies that higher expected defaults raise the funding wedge, narrow spreads, and lower the finance premium. The resulting credit easing produces an increase in loans, output, and capital, even as net worth falls initially from higher realized losses on the asset side. This response reflects the finding that post-GFC regulatory guarantees and liquidity facilities effectively decoupled wholesale funding premia from default expectations (Gilchrist and Zakrajšek, 2012). The sign reversal underscores the importance of the institutional environment in shaping how risk perceptions map into credit conditions.

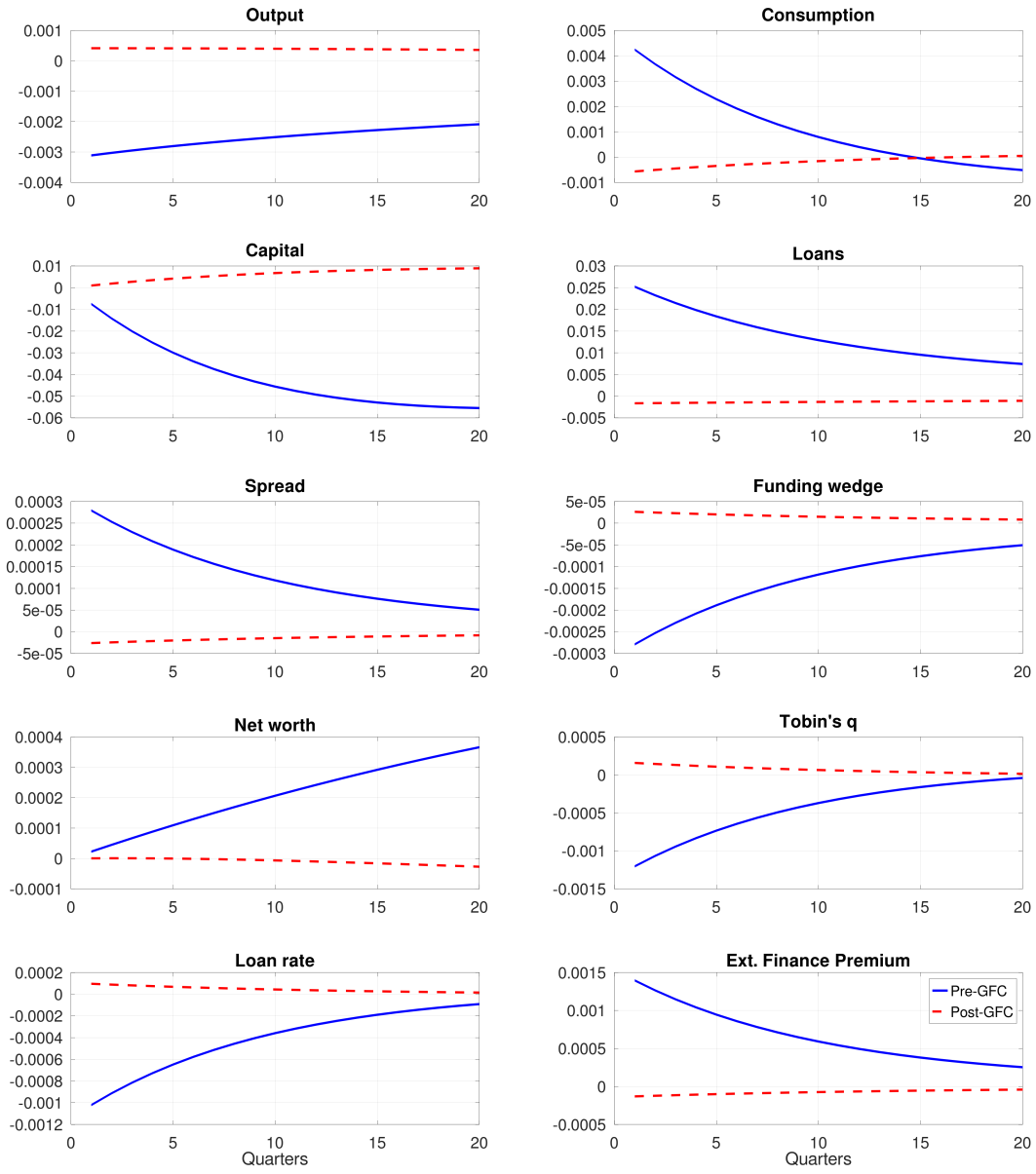


Figure 1: **Adverse Consumer-Confidence Shock (ε^C).**

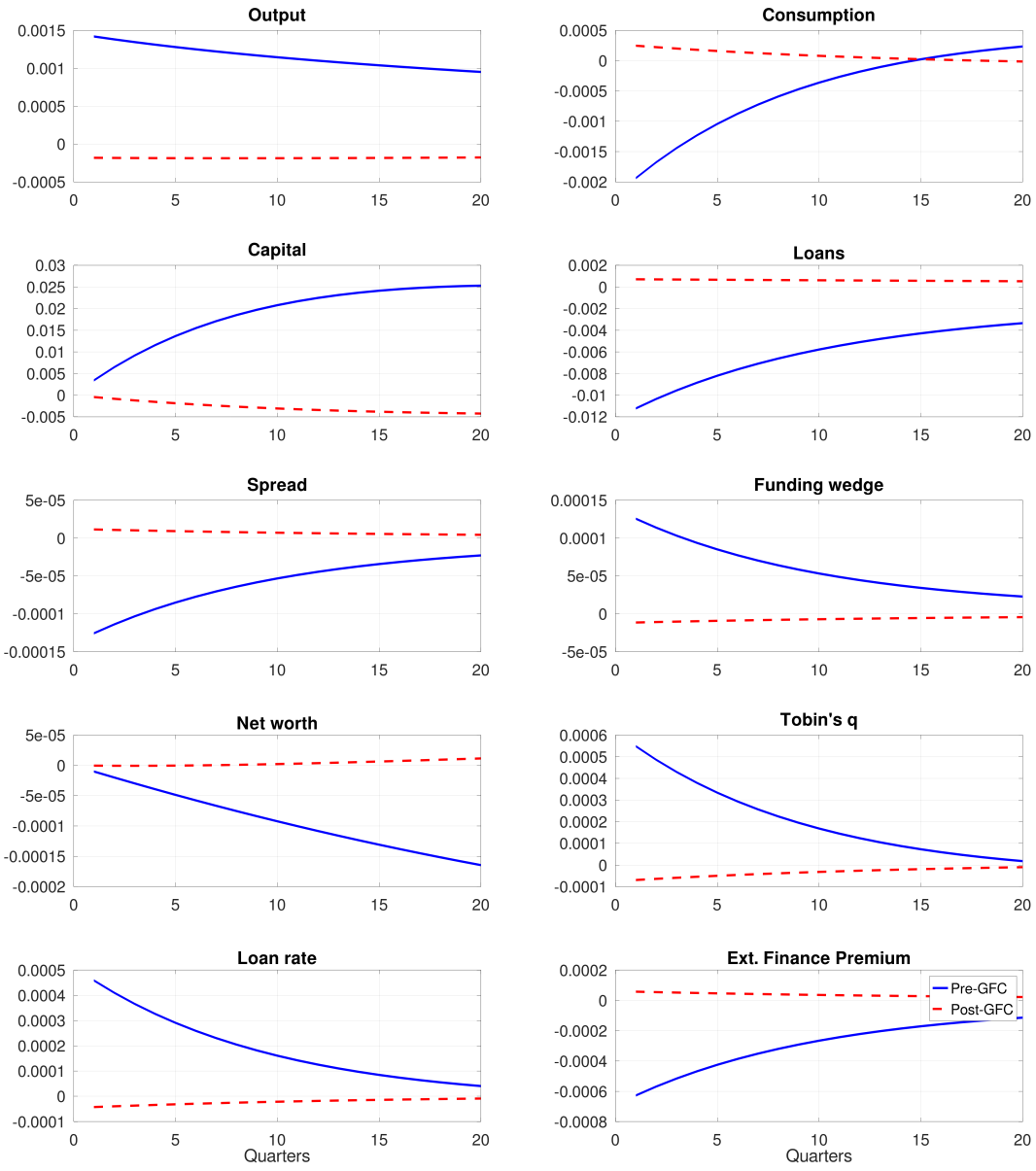


Figure 2: **Adverse Business-Confidence Shock (ε^B).**

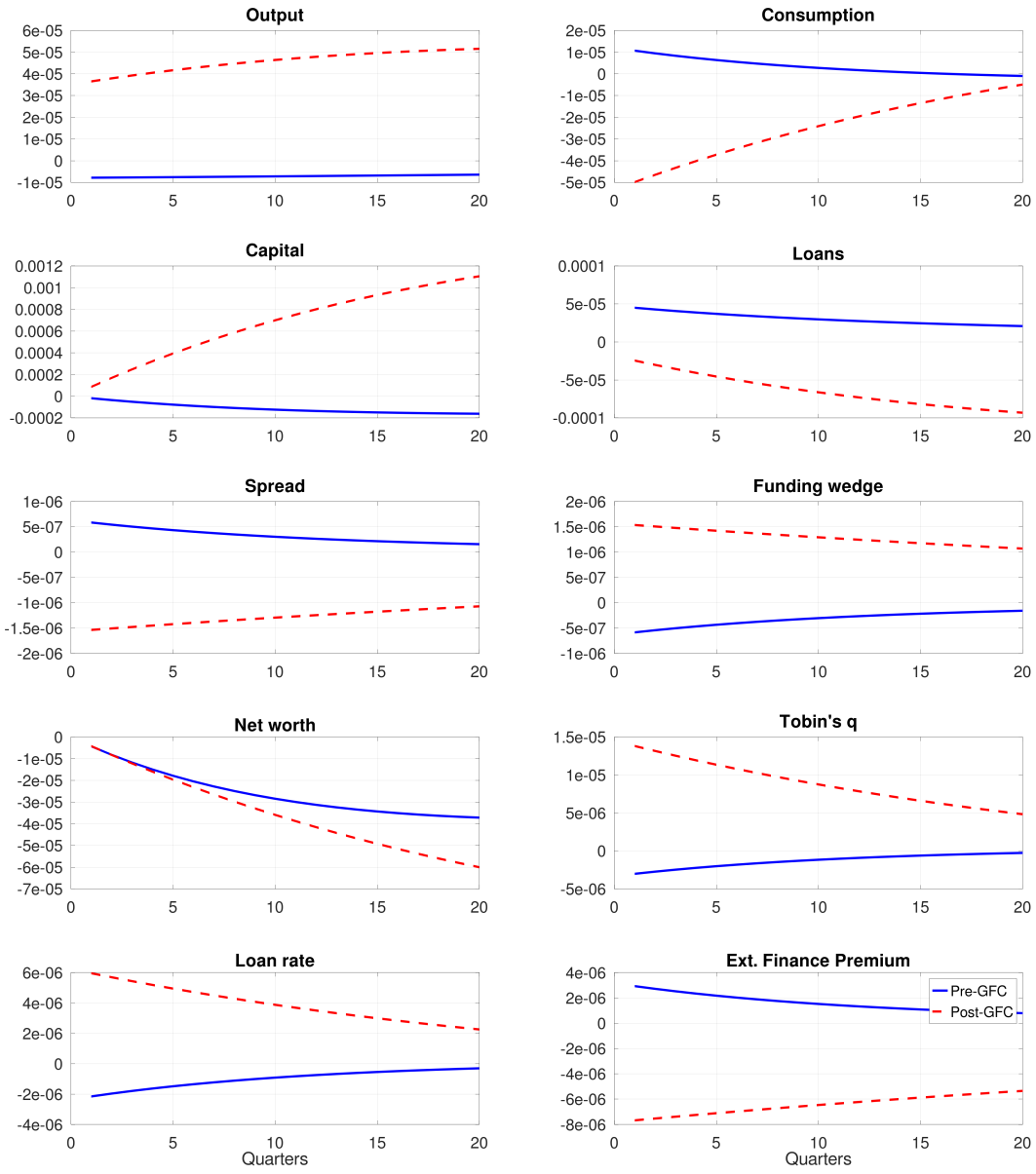


Figure 3: **Expected Default Shock (ε^{Def}).**

5.2 Impulse Responses Across the Pre- and Post-Pandemic

Figures 4 to 6 replicate the shock experiments for the pandemic split. In Figure 4, the pre-pandemic consumer-confidence shock produces the same qualitative pattern as Figure 1. Consumption rises on impact through the intertemporal-substitution channel, the funding wedge falls sharply, widening spreads and raising the finance premium. Lending and net worth decline as the credit

contraction feeds back into intermediary balance sheets. Output rises slightly on impact before declining as the investment contraction dominates. In the post-pandemic regime, the funding-wedge response is attenuated but not eliminated. Spreads widen modestly, loans decline less, and the overall propagation is substantially weaker. Because the pandemic backstop is less extreme than the post-GFC backstop, residual confidence effects are somewhat larger than in the post-GFC regime, consistent with the intermediate level of policy insulation.

The loan-demand congestion mechanism documented for the GFC period carries through to the pandemic split, as Figure 5 shows. An adverse business-confidence shock reduces loan-demand pressure, raises the funding wedge, and narrows spreads in the pre-pandemic regime. Loans and asset prices rise initially as the spread compression lowers the cost of credit, before declining over the medium horizon as weaker business sentiment depresses investment demand. Consumption falls as lower output and investment reduce household income. Net worth rises initially, supported by narrower spreads, before the real contraction erodes intermediary profits. In the post-pandemic regime, the backstop compresses the funding-wedge channel and all responses are small (Jermann and Quadrini, 2012; Adrian et al., 2013).

Unlike in the post-GFC regime, the expected-default shock is contractionary in both pandemic-era calibrations (Figure 6). Higher expected defaults lower the funding wedge, widen spreads, and reduce lending. Net worth declines as realized loan losses erode bank equity, reinforcing the credit contraction through the balance-sheet channel. Both pre- and post-pandemic responses are contractionary, unlike the post-GFC case where the negative default sensitivity reversed the sign of the funding-wedge response. The preservation of the conventional sign in both pandemic calibrations indicates that risk-based shocks transmit through both funding costs and balance-sheet impairment, consistent with a financial system that prices default risk more transparently following the regulatory reforms of the 2010s.

The pandemic comparison reinforces the central finding from the GFC analysis. Confidence-driven amplification weakens as policy backstops strengthen, while risk-based channels retain or gain importance. The credit system emerging from the pandemic is less sentiment-elastic but remains responsive to shifts in perceived default risk, consistent with the cumulative effect of macroprudential reforms and fiscal stabilization since 2008 (Guerrieri et al., 2022; Hanson et al., 2020).

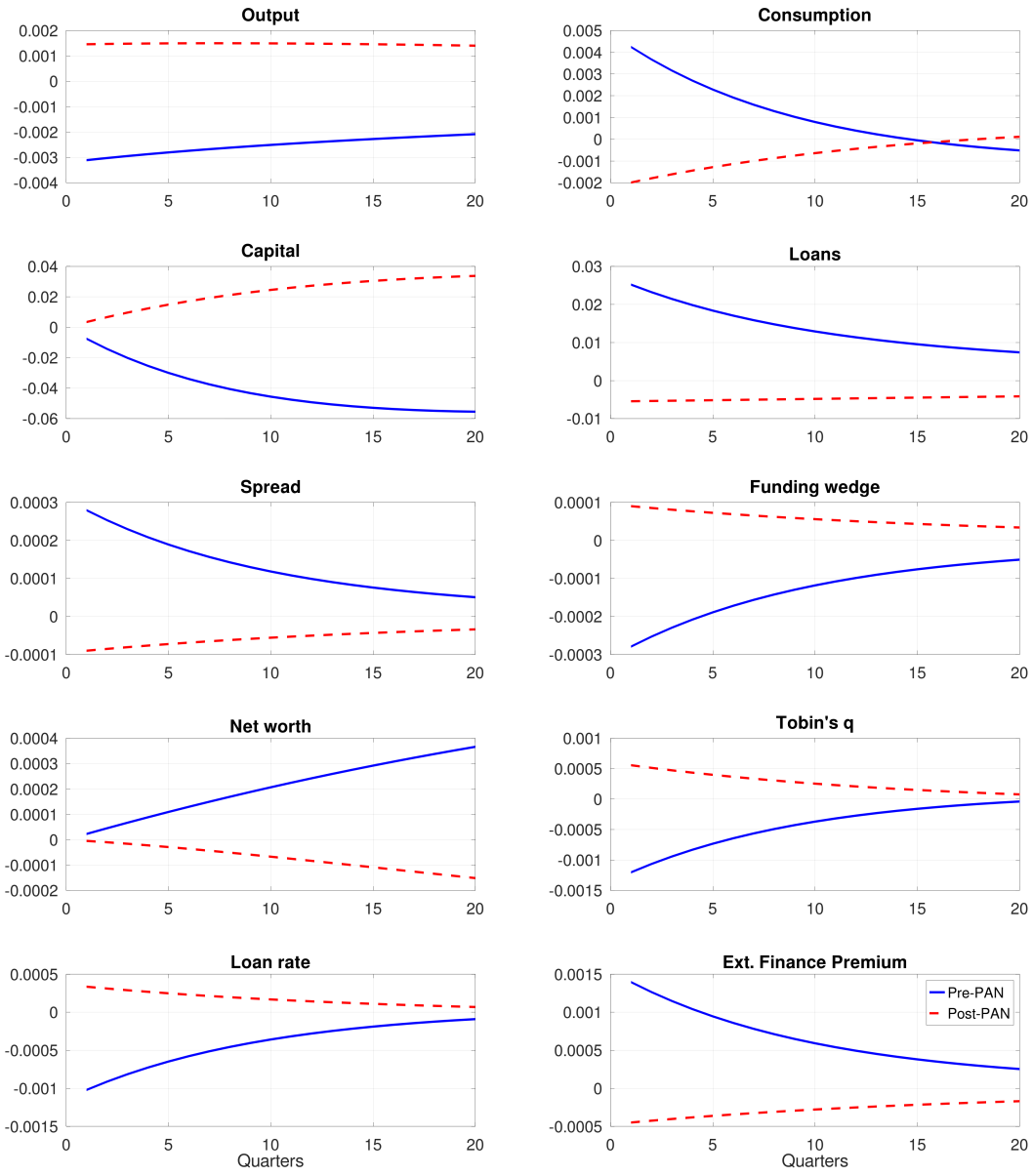


Figure 4: **Adverse Consumer-Confidence Shock (ε^C).**

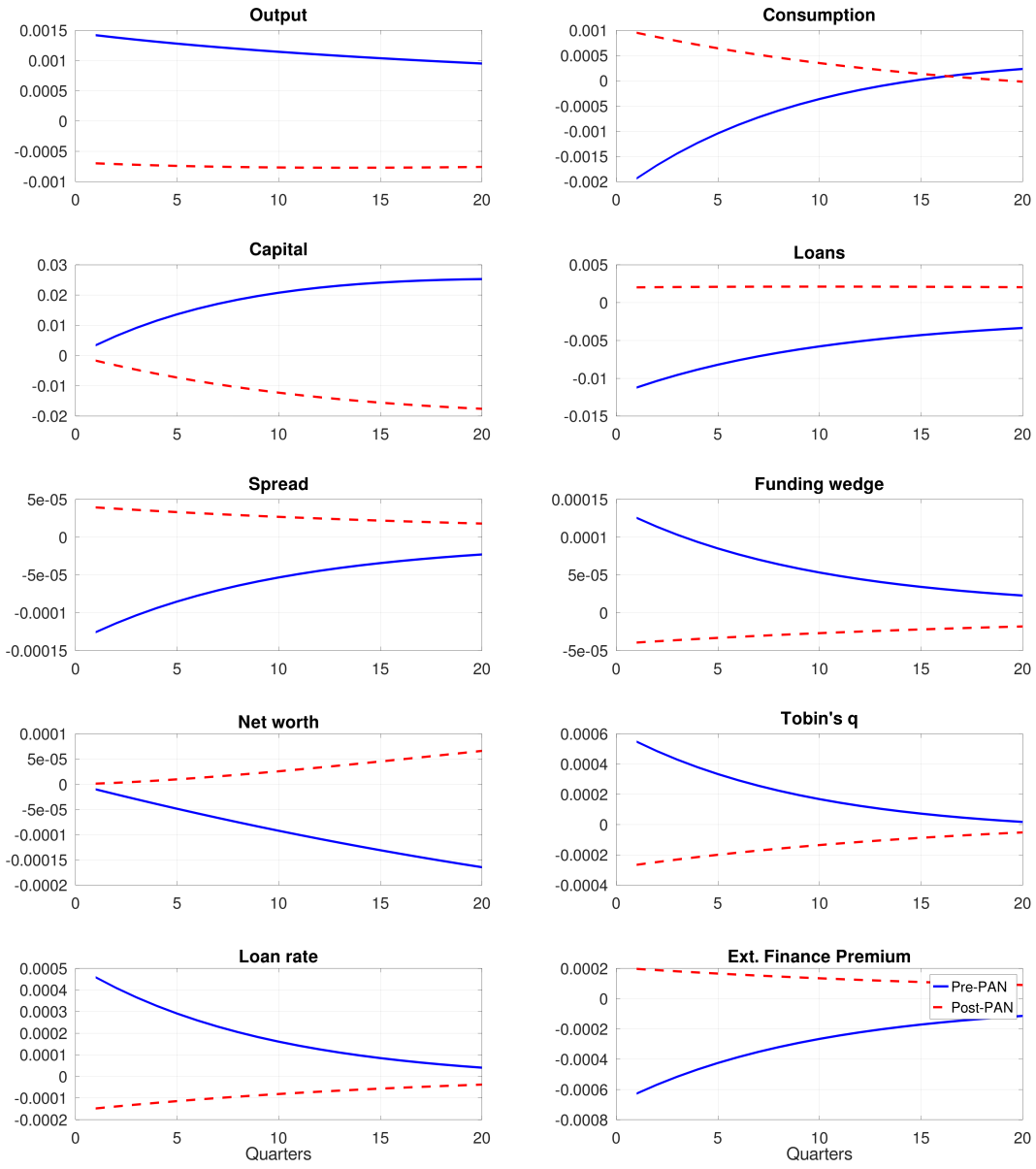


Figure 5: **Adverse Business-Confidence Shock (ε^B).**

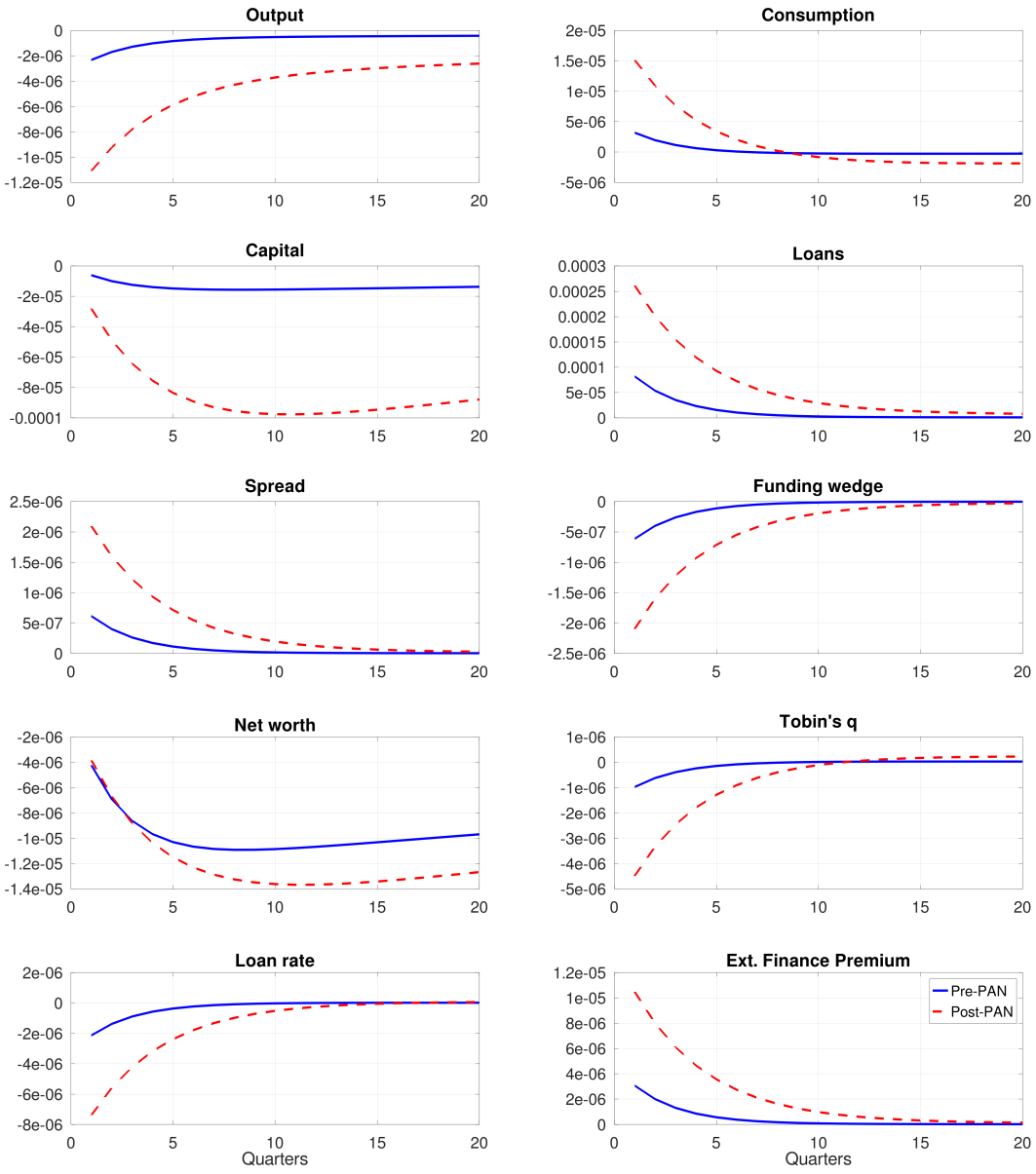


Figure 6: **Expected Default Shock (ε^{Def}).**

5.3 Variance Decomposition

Table 4 decomposes the unconditional variance of key financial variables into the contributions of the three focal shocks across the four regimes.

Table 4: Variance decomposition: confidence and default shocks across regimes (% of total variance).

	Great Financial Crisis						COVID-19 Pandemic					
	Pre			Post			Pre			Post		
Variable	ϵ^C	ϵ^B	ϵ^{Def}	ϵ^C	ϵ^B	ϵ^{Def}	ϵ^C	ϵ^B	ϵ^{Def}	ϵ^C	ϵ^B	ϵ^{Def}
Loan spread s_t	6.12	1.45	0.02	0.78	0.19	0.14	5.82	1.33	0.01	1.53	0.37	0.05
Loans L_t	2.18	0.53	0.01	0.31	0.08	0.68	2.04	0.49	0.00	0.58	0.14	0.23
Tobin's q_t	2.89	0.72	0.01	0.42	0.10	0.53	2.71	0.66	0.00	0.79	0.19	0.18
Net worth NW_t	3.97	0.85	0.34	0.53	0.13	3.28	3.52	0.76	0.04	0.98	0.24	1.12
Loan rate r_t^L	52.78	10.68	0.10	8.47	2.05	1.44	50.33	10.15	0.03	14.85	3.61	0.52

Notes: Variance shares of consumer confidence (ϵ^C), business confidence (ϵ^B), and expected-default (ϵ^{Def}) shocks. Remaining variance is attributable to productivity and monetary-policy shocks. Differences across regimes reflect changes in shock volatility and structural parameters, including backstop intensity κ_r and default sensitivity $\theta_{def}^{(r)}$.

The decomposition reveals clear regime dependence. In the pre-GFC calibration, consumer confidence accounts for more than half of loan-rate variance and contributes meaningfully to loan-spread and asset-price volatility, consistent with the strong pre-crisis amplification documented in the impulse responses. Business confidence adds a further channel through the loan-demand congestion mechanism. After the GFC, these confidence shares decline sharply. Consumer-confidence contributions to the loan rate fall from roughly 53 percent to 8 percent, and business-confidence shares drop proportionally. The higher backstop intensity compresses the funding-wedge sensitivity to sentiment, driving this decline. Expected-default shocks, by contrast, gain importance for net-worth volatility, rising from 0.34 percent pre-GFC to 3.28 percent post-GFC. This shift reflects both the higher post-crisis default-shock volatility and the tighter link between realized loan losses and intermediary equity.

The pandemic comparison displays the same pattern. Consumer confidence explains about 50 percent of pre-pandemic loan-rate variance but only 15 percent post-pandemic, and default-shock shares rise modestly across all variables. The intermediate backstop leaves a residual confidence channel that is larger than in the post-GFC regime, consistent with the impulse-response evidence. Two reinforcing mechanisms drive these cross-regime shifts. First, higher backstop intensity attenuates confidence transmission. Second, default-shock volatility rises in each post-crisis environment. The decomposition corroborates the structural shift from sentiment-driven to risk-based credit dynamics documented in the impulse-response analysis.

5.4 Model-Implied Second Moments

Table 5 reports model-implied unconditional standard deviations alongside their empirical counterparts for each regime window. Variables are classified as calibration-targeted, for which a level moment is used to discipline a model parameter, or as untargeted, for which the volatility is a free

prediction of the model. A model-to-data ratio column is included to allow the quantitative fit to be assessed directly.

Table 5: Model-data moments: Standard deviations (%) across regimes

		Model (%)		Data (%)		M/D ratio	
Variable	Type	Pre	Post	Pre	Post	Pre	Post
Panel A: GFC							
Loans†	T	7.214	10.328	6.768	7.250	1.07	1.42
Loan rate	U	0.0397	0.0534	0.0153	0.0051	2.59	10.51
Loan spread	U	0.0083	0.0061	0.0018	0.0010	4.72	6.16
Tobin's q	U	0.448	0.641	5.952	4.178	0.08	0.15
Panel B: Pandemic							
Loans†	T	6.879	9.415	3.219	9.379	2.14	1.00
Loan rate	U	0.0381	0.0498	0.0051	0.0151	7.41	3.29
Loan spread	U	0.0080	0.0065	0.0010	0.0016	7.67	3.94
Tobin's q	U	0.427	0.585	1.987	3.814	0.21	0.15

Notes: Model standard deviations are from Dynare stochastic simulations. Data standard deviations are computed from HP-filtered ($\lambda = 1600$) quarterly U.S. series over the same regime windows. "T" denotes a calibration-targeted variable; "U" denotes untargeted. The M/D ratio is the model standard deviation divided by the data standard deviation. Data sources: Loans — C&I loans as a share of GDP (FRED: BUSLOANS, GDP); Loan rate — bank prime loan rate (FRED: DPRIME); Loan spread — prime rate minus 3-month T-bill rate (FRED: DPRIME, TB3MS); Tobin's q — BIS residential property price index as proxy (FRED: QUSN628BIS).
†The loan-to-GDP ratio is the calibration target; loan-volatility moments are untargeted.

For loans, the model reproduces the data volatility closely in the pre-crisis periods and correctly orders the cross-regime shift. Loan-growth volatility rises from the pre-GFC to the post-GFC period in both the model and the data, consistent with the deleveraging and credit-allocation dynamics that accompanied the post-crisis recovery. The post-pandemic fit is essentially exact, with an M/D ratio of 1.00. Some overprediction is present in the post-GFC and pre-pandemic windows, where the model's amplification mechanism generates somewhat larger swings in lending than the data exhibit. This likely reflects the secular deleveraging of bank balance sheets after 2009, a long-run structural adjustment that the model, calibrated to within-regime dynamics, does not fully capture.

The Tobin's-q comparison exhibits systematic under-prediction. This divergence reflects a conceptual difference in measurement rather than a model failure. The model's asset-price variable

is the shadow price of installed capital expressed as a deviation from its calibrated steady state, and its small standard deviation follows from the efficient-markets discipline of the RBC core. The data proxy captures cumulative level movements in property values, including persistent secular trends, speculative components, and fiscal-policy effects that lie outside the model's business-cycle scope. Standard RBC and DSGE models routinely produce asset-price standard deviations well below data proxies for this reason. The relevant empirical check for asset prices is the directional behavior in impulse responses across regimes rather than the unconditional volatility level.

For the loan rate and loan spread, the model overstates volatility relative to the data. The model's funding wedge is a composite of all intermediation frictions normalized relative to the bank balance-sheet identity, so its units are not directly comparable to a narrow data spread such as the prime-rate–T-bill differential. This normalization gap is standard in financial-accelerator calibrations that match spread dynamics qualitatively rather than in level terms.

Despite these discrepancies in price-type moments, the model passes the regime-ordering test most relevant for the paper's central argument. Both model and data record higher loan volatility in the post-crisis periods, and the directional decline in confidence-driven spread fluctuations is preserved across all four windows. Shifting the regime boundaries by one to two quarters does not alter this qualitative ordering.

5.5 Sensitivity Analysis

Figures 7 and 8 and Tables 6–7 report the sensitivity of the lending variance decomposition to the backstop parameter. Raising backstop intensity from zero to one monotonically reduces the consumer- and business-confidence shares of loan variance, while default and monetary-policy shares are largely unaffected. This confirms that policy insulation primarily suppresses confidence-to-lending transmission.

To assess robustness, we also vary the funding-wedge sensitivity, the monetary pass-through coefficient, and the default-loss elasticity. Higher funding-wedge sensitivity amplifies confidence shares at the expense of technology shares, confirming that the confidence-to-funding channel is a key determinant of the decomposition. Increasing the monetary pass-through raises the policy share and reduces the residual technology contribution, while higher default-loss elasticity strengthens the default channel modestly. The qualitative patterns documented above are robust to plausible variation in all three parameters.

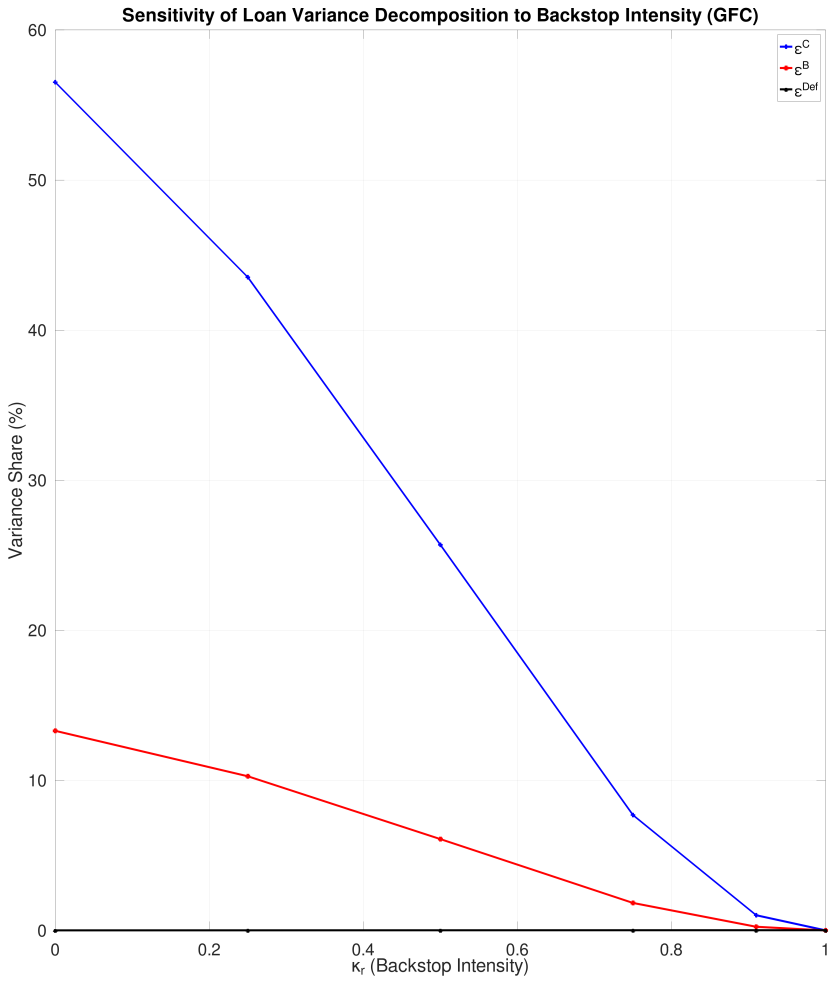


Figure 7: **Sensitivity Analysis: Variance Decomposition Response to Backstop Intensity (κ_r) in GFC Regime.**

Table 6: Sensitivity of lending variance decomposition to backstop intensity (GFC calibration).

κ_r	ε^C share (%)	ε^B share (%)	ε^{Def} share (%)
0.00	0.863397	0.189358	0.046468
0.25	0.520174	0.106965	0.046593
0.50	0.262182	0.047689	0.046667
0.75	0.091176	0.011946	0.046690
0.91	0.027955	0.001549	0.046677
1.00	0.008344	0.000000	0.046661

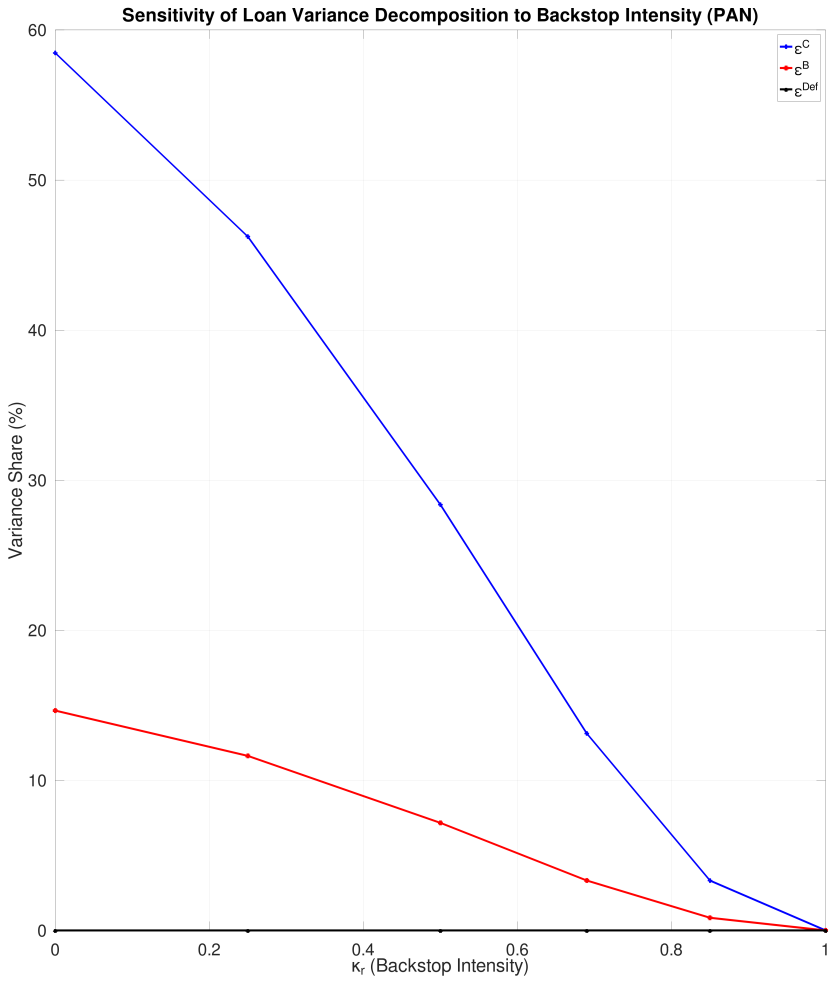


Figure 8: **Sensitivity Analysis: Variance Decomposition Response to Backstop Intensity (κ_r) in Pandemic Regime.**

Table 7: Sensitivity of lending variance decomposition to backstop intensity (Pandemic calibration).

κ_r	ε^C share (%)	ε^B share (%)	ε^{Def} share (%)
0.00	1.123613	0.263526	0.000790
0.25	0.673806	0.149014	0.000796
0.50	0.336306	0.066479	0.000801
0.69	0.156765	0.025602	0.000805
0.85	0.057895	0.006000	0.000807
1.00	0.008991	0.000000	0.000808

6 Conclusion

This paper studies how consumer and business confidence shape bank credit dynamics across financial regimes, using a DSGE model with an explicit banking sector, realized default losses, and a nominal monetary block calibrated to U.S. data before and after the Great Financial Crisis and the COVID-19 pandemic.

We find that confidence shocks are the primary driver of credit fluctuations in the pre-crisis regime. Consumer confidence operates through the funding wedge: an adverse shock raises bank intermediation costs, compresses net worth, and curtails lending persistently. Business confidence acts simultaneously through supply and demand, reducing investment efficiency and tightening loan supply, with both forces reinforcing each other in equilibrium. Together, confidence shocks account for the bulk of credit variance in the pre-crisis periods, consistent with the theoretical channels identified in Lemmas 1–2 and Proposition 1.

We show that this pattern reverses in the post-crisis regime. As backstop intensity rises with stronger regulation and policy support, the sensitivity of the funding wedge to sentiment declines sharply, and expected-default shocks emerge as the dominant source of credit fluctuations. Banks price realized default risk rather than beliefs, attenuating the procyclical amplification of confidence while exposing the financial system more directly to credit-quality deterioration. The nominal policy block reinforces this transition: policy-rate movements realign with risk-based rather than belief-based pricing of credit.

These findings reveal a structural feature of the credit cycle that constant-regime models cannot capture. The influence of the confidence channel depends on the prevailing backstop environment, which helps explain why identical aggregate shocks can produce markedly different credit outcomes across regulatory and policy landscapes.

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Appendix A: Proofs

Proof 1 (Lemma 1) *From the bank's funding wedge* $\omega_t = s_r(1-\kappa_r)\gamma_{fund,0}(\gamma_C\, conf_t^C - \gamma_{LD}\Lambda_t) - \theta_{def}^{(r)}\,\mathbb{E}_t[d_{t+1}] - \theta_{mp}(i_t^{nom} - \bar{i})$*, we obtain* $\partial\omega_t/\partial conf_t^C = s_r(1-\kappa_r)\gamma_{fund,0}\gamma_C$*. Using the interior FOC* $\mu - \omega_t + \kappa_{col}(q_t - 1) = \mathcal{C}'(L_t)$ *with* $\mathcal{C}''(L_t) > 0$*, it follows that*

$$\frac{\partial L_t}{\partial conf_t^C} = -\frac{s_r(1-\kappa_r)\gamma_{fund,0}\gamma_C}{\mathcal{C}''(L_t)}.$$

Hence, in regimes where $s_r(1-\kappa_r)\gamma_{fund,0} < 0$*, higher consumer confidence raises lending.*

Proof 2 (Lemma 2) *(i) On the demand side, higher business confidence increases installation efficiency* $\zeta_t = \exp(\psi_i\, conf_t^B)$*, reducing the marginal cost of investment and raising loan demand. (ii) On the supply side, the same confidence innovation moves the funding wedge by* $\partial\omega_t/\partial conf_t^B = -s_r(1-\kappa_r)\gamma_{fund,0}\gamma_{LD}\chi_B^{LD}$*, so*

$$\frac{\partial L_t}{\partial conf_t^B} = \frac{s_r(1-\kappa_r)\gamma_{fund,0}\gamma_{LD}\chi_B^{LD}}{\mathcal{C}''(L_t)}.$$

When $s_r(1-\kappa_r)\gamma_{fund,0} < 0$*, the supply channel can still raise lending. Both forces then shift equilibrium lending upward.*

Proof 3 (Proposition 1) *(1) Interior: When the leverage constraint is slack, the bank chooses* L_t *from the first-order condition*

$$\mu - \omega_t = \mathcal{C}'(L_t), \qquad \mathcal{C}''(L_t) > 0.$$

By the Implicit Function Theorem,

$$\frac{\partial L_t}{\partial \mu} = \frac{1}{\mathcal{C}''(L_t)} > 0, \qquad \frac{\partial L_t}{\partial \omega_t} = -\frac{1}{\mathcal{C}''(L_t)} < 0.$$

Under (3.16), the funding wedge satisfies

$$\frac{\partial \omega_t}{\partial conf_t^C} = s_r(1-\kappa_r)\gamma_{fund,0}\gamma_C, \qquad \frac{\partial \omega_t}{\partial conf_t^B} = -s_r(1-\kappa_r)\gamma_{fund,0}\gamma_{LD}\chi_B^{LD},$$

so

$$\frac{\partial L_t}{\partial conf_t^C} = -\frac{s_r(1-\kappa_r)\gamma_{fund,0}\gamma_C}{\mathcal{C}''(L_t)}, \qquad \frac{\partial L_t}{\partial conf_t^B} = \frac{s_r(1-\kappa_r)\gamma_{fund,0}\gamma_{LD}\chi_B^{LD}}{\mathcal{C}''(L_t)},$$

which highlights asymmetric confidence transmission through funding and demand-pressure channels. Similarly, differentiating ω_t *with respect to the backstop parameter* κ_r *gives*

$$\frac{\partial \omega_t}{\partial \kappa_r} = -\,s_r\gamma_{fund,0}(\gamma_C\, conf_t^C - \gamma_{LD}\Lambda_t).$$

Hence

$$\frac{\partial L_t}{\partial \kappa_r} = \frac{\partial L_t}{\partial \omega_t} \cdot \frac{\partial \omega_t}{\partial \kappa_r} = \frac{s_r \gamma_{fund,0}(\gamma_C \, conf_t^C - \gamma_{LD}\Lambda_t)}{\mathcal{C}''(L_t)}.$$

This expression is non-negative whenever $\gamma_C \, conf_t^C - \gamma_{LD}\Lambda_t \leq 0$*, that is, when the economy is in a low-confidence state. In such periods, a larger backstop* ($\kappa_r \uparrow$) *raises lending. The default-risk component* $\theta_{def}^{(r)} E_t[d_{t+1}]$ *and the monetary component* $\theta_{mp}(i_t^{nom} - \bar{i})$ *are orthogonal to* $conf_t^j$ *and* κ_r *and does not affect these signs.*

(2) Binding: If the leverage cap binds, $L_t = \phi_{bank} NW_t$*. Then* $\partial L_t / \partial NW_t = \phi_{bank} > 0$ *and* $\partial L_t / \partial \phi_{bank} = NW_t > 0$*, while the KKT conditions imply* $\partial L_t / \partial \mu = \partial L_t / \partial \omega_t = 0$ *locally when the cap binds (price wedges move the multiplier rather than* L_t*).*

Appendix B: Equilibrium Conditions

The competitive equilibrium for this economy is defined by a sequence $\{c_t, n_t, k_t, i_t, y_t, w_t, R_t^k, q_t, \Phi_t, \zeta_t, A_t,\ r_t^d, r_t^L, s_t, L_t, NW_t, D_t, \Pi_t^B, \mathcal{C}_t,\ \omega_t, \pi_t, i_t^{nom}, ygap_t, \delta_t^L, \Lambda_t, conf_t^C, conf_t^B, e_t^C, d_t\}_{t=0}^{\infty}$ and shocks $\{\varepsilon_t^A, \varepsilon_t^C, \varepsilon_t^B, \varepsilon_t^{\text{def}}, \varepsilon_t^{mp}\}_{t=0}^{\infty}$ satisfying the following conditions.

Households

$$\chi\, n_t^{\eta} = w_t\, c_t^{-\sigma}, \tag{B1}$$

$$1 = \beta\, \mathbb{E}_t\left[\frac{e_{t+1}^C}{e_t^C}\left(\frac{c_{t+1}}{c_t}\right)^{-\sigma}(1 + r_{t+1}^d)\right], \tag{B2}$$

$$e_t^C = \exp(\phi_c\, conf_t^C). \tag{B3}$$

Firms

$$y_t = A_t\, k_t^{\alpha}\, n_t^{1-\alpha}, \tag{B4}$$

$$w_t = (1-\alpha)\, A_t\left(\frac{k_t}{n_t}\right)^{\alpha}, \tag{B5}$$

$$R_t^k = \alpha\, A_t\left(\frac{n_t}{k_t}\right)^{1-\alpha}, \tag{B6}$$

$$q_t = \beta\, \mathbb{E}_t\left[\frac{e_{t+1}^C}{e_t^C}\left(\frac{c_{t+1}}{c_t}\right)^{-\sigma}(R_{t+1}^k + (1-\delta)\, q_{t+1})\right], \tag{B7}$$

$$q_t = 1 + \frac{\varphi}{\zeta_t}\left(\frac{i_t}{k_t} - \delta\right), \tag{B8}$$

$$k_{t+1} = (1-\delta)k_t + i_t, \tag{B9}$$

$$\zeta_t = \exp(\psi_i\, conf_t^B), \tag{B10}$$

$$\Phi_t = \frac{\varphi}{2\,\zeta_t}\left(\frac{i_t}{k_t} - \delta\right)^2 k_t. \tag{B11}$$

Nominal Block

$$ygap_t \equiv y_t - \bar{y}, \tag{B12}$$

$$\pi_t = \beta\, \mathbb{E}_t[\pi_{t+1}] + \kappa_{\pi}\, ygap_t, \tag{B13}$$

$$i_t^{nom} = \rho_i\, i_{t-1}^{nom} + (1-\rho_i)[\bar{i} + \phi_{\pi}(\pi_t - \bar{\pi}) + \phi_y\, ygap_t] + \varepsilon_t^{mp}, \tag{B14}$$

$$1 + r_t^d = \frac{1 + i_t^{nom}}{1 + \mathbb{E}_t[\pi_{t+1}]}. \tag{B15}$$

Banks

$$s_t = r_t^L - r_t^d, \tag{B16}$$

$$s_t = \mu - \omega_t, \tag{B17}$$

$$\Lambda_t = \chi_B^{LD}\, conf_t^B + \chi_i^{LD}\Big(\frac{i_t}{k_t} - \delta\Big) + \chi_q^{LD}(q_t - 1), \tag{B18}$$

$$\omega_t = s_r(1-\kappa_r)\,\gamma_{fund,0}\,(\gamma_C\, conf_t^C - \gamma_{LD}\Lambda_t) - \theta_{\text{def}}^{(r)}\,\mathbb{E}_t[d_{t+1}] - \theta_{mp}(i_t^{nom} - \bar{i}), \tag{B19}$$

$$\delta_t^L = \bar{\delta}_L \exp(\lambda_{def} d_t), \tag{B20}$$

$$\mathcal{C}_t = \tfrac{\kappa_L}{2} L_t^2, \tag{B21}$$

$$\mu - \omega_t + \kappa_{col}(q_t - 1) = \kappa_L\, L_t, \tag{B22}$$

$$\Pi_t^B = (\mu - \omega_t)L_t + r_t^d\, NW_t - \mathcal{C}_t - \delta_t^L L_t, \tag{B23}$$

$$NW_{t+1} = \rho_{NW}\, NW_t + \lambda_\Pi\, \Pi_t^B \;+\; \xi_{NW}(q_t - 1)\, NW_t, \tag{B24}$$

$$L_t = D_t + NW_t. \tag{B25}$$

The external finance premium links credit conditions to the cost of capital:

$$efp_t = \chi_{efp}(s_t - \bar{\mu}), \qquad s_t = \mu - \omega_t.$$

The bank's interior lending condition, augmented by the collateral channel, is

$$\mu - \omega_t + \kappa_{col}(q_t - 1) = \kappa_L L_t,$$

realized default losses follow

$$\delta_t^L = \bar{\delta}_L \exp(\lambda_{def} d_t),$$

and net worth accumulates as

$$NW_{t+1} = \rho_{NW} NW_t + \lambda_\Pi \Pi_t^B + \xi_{NW}(q_t - 1) NW_t.$$

Market Clearing

$$y_t = c_t + i_t + \Phi_t + \mathcal{C}_t. \tag{B26}$$

Exogenous Processes

$$\log A_t = (1-\rho_A)\bar{a} + \rho_A \log A_{t-1} + \varepsilon_t^A, \tag{B27}$$

$$conf_t^C = \rho_C \, conf_{t-1}^C + \varepsilon_t^C, \tag{B28}$$

$$conf_t^B = \rho_B \, conf_{t-1}^B + \varepsilon_t^B, \tag{B29}$$

$$d_t = \rho_{\text{def}} \, d_{t-1} + \sigma_{\text{def}} \, \varepsilon_t^{\text{def}}, \tag{B30}$$

with $\varepsilon_t^x \sim \mathcal{N}(0, \sigma_x^2)$ for all exogenous innovations $x \in \{A, C, B, \text{def}, mp\}$.

Appendix C: Data Sources and Replicability

All data series used in the calibration are publicly available:

- **Consumer confidence:** University of Michigan Index of Consumer Sentiment (FRED: UMCSENT).
- **Business confidence:** NFIB Small Business Optimism Index.
- **Credit spreads:** Bank Prime Loan Rate minus Treasury Bill Rate (FRED: DPRIME, TB3MS).
- **Loan-to-output ratio:** Commercial and Industrial Loans (FRED: BUSLOANS) divided by nominal GDP (FRED: GDP).
- **Charge-off rates:** Commercial Bank Charge-Off Rate on C&I Loans (FRED: CORLCBSL).

All series are quarterly, seasonally adjusted where available. The model code (Dynare `.mod` files compatible with GNU Octave) is available in the supplementary materials.

Appendix D: Notation Table

Table D1: Summary of notation.

Symbol	Description	Domain
c_t	Consumption	$\mathbb{R}_+$
n_t	Labor hours	$[0,1]$
k_t	Capital stock	$\mathbb{R}_+$
i_t	Investment	$\mathbb{R}_+$
y_t	Output	$\mathbb{R}_+$
w_t	Real wage	$\mathbb{R}_+$
R_t^k	Rental rate of capital	$\mathbb{R}_+$
q_t	Tobin's Q	$\mathbb{R}_+$
A_t	TFP	$\mathbb{R}_+$
ζ_t	Installation efficiency	$\mathbb{R}_+$
e_t^C	Consumer preference shifter	$\mathbb{R}_+$
L_t	Bank loans	$\mathbb{R}_+$
D_t	Deposits	$\mathbb{R}_+$
NW_t	Bank net worth	$\mathbb{R}_+$
r_t^d	Real deposit rate	$\mathbb{R}$
r_t^L	Real loan rate	$\mathbb{R}$
π_t	Inflation rate	$\mathbb{R}$
i_t^{nom}	Nominal policy rate	$\mathbb{R}$
$ygap_t$	Output gap $(y_t - \bar{y})$	$\mathbb{R}$
s_t	Loan–deposit spread	$\mathbb{R}$
ω_t	Funding wedge	$\mathbb{R}$
Λ_t	Loan-demand pressure index	$\mathbb{R}$
δ_t^L	Realized loan-loss rate	$\mathbb{R}_+$
Π_t^B	Bank profits	$\mathbb{R}$
$\mathcal{C}_t$	Intermediation costs	$\mathbb{R}_+$
$conf_t^C$	Consumer confidence	$\mathbb{R}$
$conf_t^B$	Business confidence	$\mathbb{R}$
d_t	Expected-default factor	$\mathbb{R}$
Parameters		
μ	Baseline intermediation margin	$\mathbb{R}_+$
κ_r	Backstop intensity	$[0,1]$

Continued on next page

Table D1 — continued

Symbol	Description	Domain
s_r	Policy sensitivity sign	$\{-1, +1\}$
$\gamma_{fund,0}$	Funding sensitivity scale	$\mathbb{R}_+$
γ_C	Consumer-confidence funding loading	$\mathbb{R}_+$
γ_{LD}	Demand-pressure pass-through loading	$\mathbb{R}_+$
$\chi_B^{LD}, \chi_i^{LD}, \chi_q^{LD}$	Components of Λ_t	$\mathbb{R}_+$
$\theta_{def}^{(r)}$	Expected-default sensitivity	$\mathbb{R}$
θ_{mp}	Monetary pass-through to wedge	$\mathbb{R}_+$
ϕ_{bank}	Leverage cap	$\mathbb{R}_+$
κ_L	Intermediation cost curvature	$\mathbb{R}_+$
$\rho_i, \phi_\pi, \phi_y, \kappa_\pi$	Monetary policy and NKPC parameters	$\mathbb{R}_+$