When Deposits are Uninsured: Revisiting the Bank Liabilities Channel

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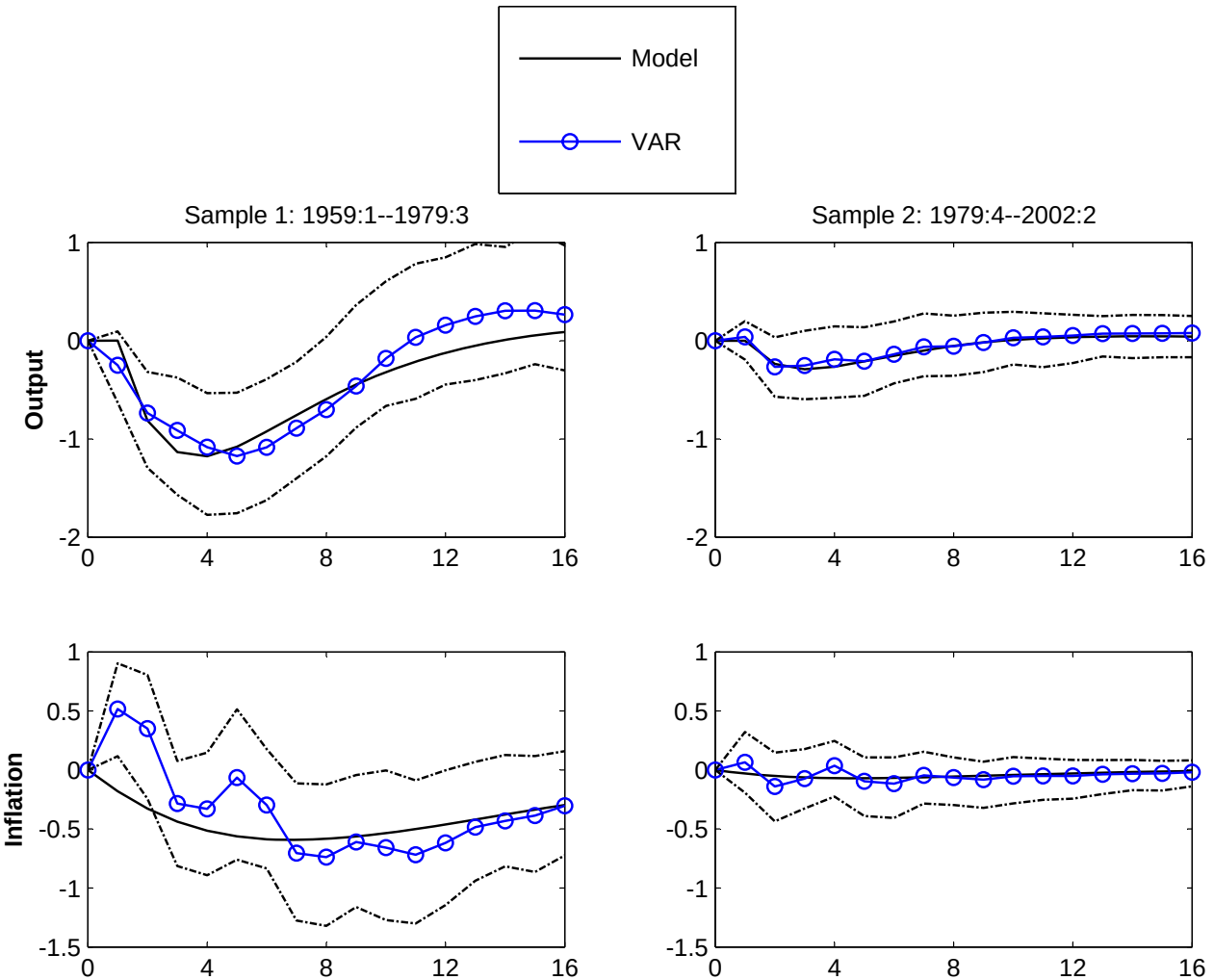
Motivation: From Boivin and Giannoni (2006), "Has Monetary Policy Become More Effective?"

Figure 1. VAR and Model-Based Impulse Responses to a Same-Size Monetary Shock



Motivation: From Tenreyro and Thwaites (2016), "US Monetary Policy is Less Powerful in Recessions"

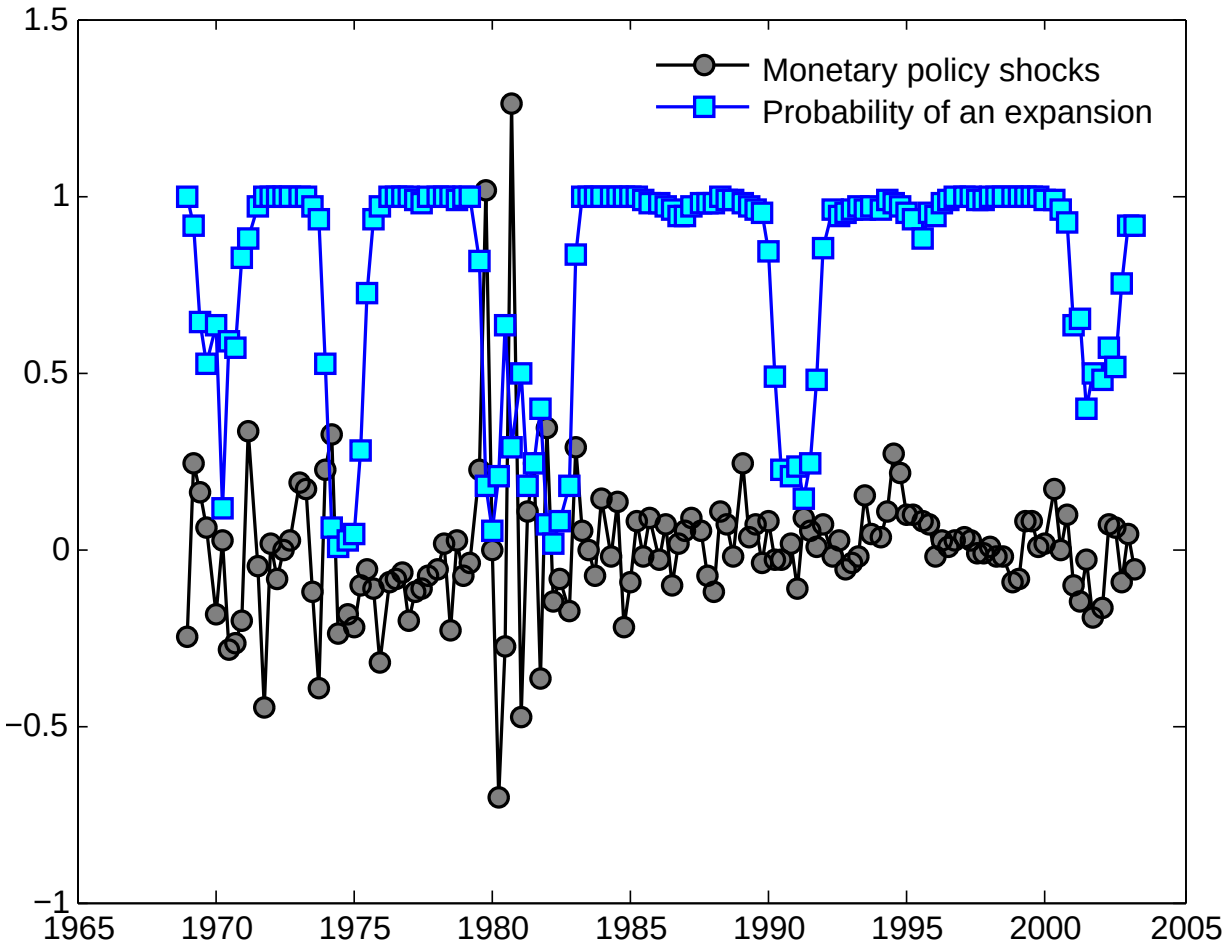


Figure 1: Monetary policy shocks and the state of the economy

Bank Lending Channel of Monetary Policy: A Simplified Overview

- As monetary policy tightens and the policy rate rises:
  - Deposit rates rise slowly compared to those on government bonds or money market mutual funds ($\beta < 1$)
  - Depositors switch to these outside options (an assumption on which the entire literature relies heavily on)
    - Banks' deposit base shrinks
    - Banks lose cheaper funding
    - Agents are holding fewer safe and liquid assets (bank deposits), so they take on fewer risky projects
    - Banks curtail lending
  - Credit falls, and macroeconomic activity slows down
  - But $\beta^{UD} \neq \beta^{ID}$

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- What if the higher uninsured deposit beta means that uninsured depositors do not switch to outside options? Then, uninsured deposits will not go down and credit will fall by less. This implies weaker monetary policy transmission.

- To our knowledge, none of the many (many) studies in the bank lending channel literature has investigated this channel.

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Implications for Monetary Policy

- Implications for the effectiveness of MP?
- Does this explain why recent rate increases by the Fed have not done much "damage" to the economy?

So, let's look at uninsured deposits

- Uninsured deposits (>\$250,000 in the US) constitute a substantial portion of total deposits.
  - As of 2024, approximately 40% of all deposits in the US were uninsured (Dias and Schmidt-Eisenlohr, 2025)
- UD have attracted some interest recently
  - Especially after the banking distress of March 2023
  - Dias and Schmidt-Eisenlohr (2025), DeMarzo, Krishnamurthy and Nagel (2024), Drechsler, et al. (2025), Damar, Gropp and Mordel (2025), Kim, Kundu and Purnanandam (2024), Flanagan, et al. (2025), Chi et al. (2026)
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Deposit Rates and the Uninsured Deposit Premium

- Uninsured deposits earn a **higher rate** compared to insured deposits (uninsured deposit premium)
- Uninsured deposits have a **higher deposit beta**
- **The uninsured deposit premium in the US has increased over time**
  - US: Egan, Hortaçsu and Matvos (2017), Drechsler, et al. (2025), Dias and Schmidt-Eisenlohr (2025)
  - Canada: Damar, Gropp and Mordel (2025)
  - Estimates for North America vary between 50 and 400 bps

There's a Premium - Why?

- There is no agreement on why the uninsured deposit premium exists
  - Because uninsured deposits are risky? Egan, Hortaçsu and Matvos (2017), Damar, Gropp and Mordel (2025), Flanagan et al. (2025)
  - Because large depositors have outside options and hence bargaining power? Dias and Schmidt-Eisenlohr (2025)
- The literature has mostly examined this phenomenon from a "bank run risk" lens and "run dynamics"
- Nothing on the implications for monetary policy
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WHAT WE DO: Empirics

- We start by posing the following empirical questions:
  1. Do uninsured deposits have a higher beta? Yes
  2. Does the **uninsured deposit beta** depend on a bank's reliance on uninsured deposits? Yes, but...
  3. During a monetary policy cycle, do the changes in quantities of insured vs. uninsured deposits depend on a bank's reliance on uninsured deposits? Yes, but...

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WHAT WE DO: Theory

- We extend Quadrini (JME, 2017) to allow for both traditionally insured deposits and larger, uninsured ones. Use the model to revisit the bank liabilities channel
- Banks:
  - They intermediate between entrepreneurs (depositors) and households (borrowers)
- Firms/Entrepreneurs:
  - Heterogeneous in their productivity
  - Subject to labor risk, idiosyncratic productivity revealed before hiring decisions are made
  - They hold insured deposits (to diversify away risk)
  - They also hold uninsured deposits (higher returns)
- Households:
  - They get loans to finance consumption and purchases of housing assets
  - subject to a collateral constraint

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Model: Entrepreneurs

- There is a unit mass 1 of entrepreneurs indexed by i
- Productivity z_i is idiosyncratic
- $E_0 \sum_{t=0}^{\infty} \beta^t ln(c_{i,t})$
- They operate a production function linear in labor $y_i = z_i h_i$
- They hold Treasury bills, insured and uninsured deposits
- With pr=ϕ banks stay in business and pay back uninsured deposits
- With pr=$(1-\phi)$ banks default on their liabilities and creditors can negotiate to get a fraction ϵ_t back
- After a monetary policy tightening, depositors' bargaining rises $\rightarrow$ $\epsilon_{t+1} = f(q_t) \quad f'(.) < 0$ (due to negative aggregate effect on deposits)

Model: Households

- There is a unit mass of infinitely-lived households
- They are risk-neutral $E_0 \sum_{t=0}^{\infty} \beta^t \left(c_t^H - \alpha \frac{h_t^{1+\frac{1}{\nu}}}{1+\frac{1}{\nu}} \right)$
- They get loans l_{t+1} from banks to finance consumption and housing costs
- To introduce a role for monetary policy:
  $p_t^K = f(q_t) \quad f'(.) > 0$ since housing and bond prices comove
- Their budget constraint: $c_t^H + p_t^K (k_{t+1} - k_t) + l_t = \frac{l_{t+1}}{R_t^l} + w_t h_t + \chi k_t$
- Their collateral constraint $l_{t+1} \leq K + \eta E_t p_{t+1}^K k_{t+1} \qquad [\mu_t]$

Model: Financial Intermediaries

- Banks get deposits d^I and d^U from firms and lend to households
- Their balance sheet equation: $l = (d^I + d^U)$.
- Leverage: $lev \equiv \frac{(d^I + d^U)}{l}$
- Uninsured leverage: $lev^U \equiv \frac{d^U}{l} = \frac{d^U}{(d^I + d^U)}$
- For every unit of deposits, they pay an operation cost increasing in leverage $\Psi(lev^U) = \frac{\theta}{\kappa}\left(\frac{d^U}{d^I + d^U}\right)^{\kappa} \qquad \Psi(.)' > 0 \quad \Psi(.)'' > 0$
- Banks default with probability $(1 - \phi)$. Depositors liquidate bank assets and recover a share ϵ of uninsured deposits
- Banks' residual liabilities $\tilde{d}_t$:

$$\tilde{d}_t(d_t^I, d_t^U) = \begin{cases} (d_t^I + d_t^U) & with pr = \phi \\ \epsilon_t d_t^U & with pr = (1 - \phi) \end{cases}$$

Model: Financial Intermediaries, Continued

- Banks internalize the fact that a higher degree of uninsured leverage, larger and uninsured deposits, allows them access to more profitable investment opportunities

- The effective return on loans $\tilde{R}^L$:

$$\tilde{R}^l_t = R^l_t(1 + \Gamma_t) \qquad \Gamma_t = \frac{\theta}{\gamma}\left(lev^U_{t+1}\right)^{\gamma}$$

Model: Monetary Policy

- Taylor rule for for the price of Treasury bills:

$$q_t = \rho q_{t-1} + (1-\rho)\left[\gamma_\pi \pi_t + \gamma_{\hat{y}} \hat{y}_t\right] + \epsilon_t^q \qquad \epsilon^q \sim N(0, \sigma_q^2)$$

  where π is inflation, $\hat{y}$ is output deviations, $\gamma_\pi < 0$ and $\gamma_{\hat{y}} < 0$.

- Negative draw of ϵ^q equivalent to a tightening of the stance of monetary policy

Model: Empirical Implications

- Solving this model gives us four testable implications:

1. $$p_t^I = \left\{ \beta(1-\phi) + \frac{1}{\tilde{R}_t^I} \right\} \frac{1}{[1-\Psi(.)]}$$

   $\frac{\partial p_t^I}{\partial q_t} > 0$ *Insured deposits have a positive beta*

2. $$p_t^U = \left\{ \beta\left[\phi + (1-\phi)\epsilon_{t+1} - 1\right] + \frac{1}{\tilde{R}_t^I} \right\} \frac{1}{[1-\Psi(lev^U)]}$$

   $\frac{\partial p_t^U}{\partial q_t} > 0$ *Uninsured deposits have a positive beta*

3. $\frac{\partial^2 p_t^I}{\partial q_t \partial lev_{t+1}^U}$ is ambiguous $\rightarrow$ An empirical question
4. Same for p_t^U

Transmission Channels

1. Banks have access to more profitable investment opportunities when they are able to attract larger, uninsured deposits:

$$\frac{\partial \tilde{R}_t^l}{\partial lev_{t+1}^U} = R_t^l \frac{\partial \Gamma(.)}{\partial lev_{t+1}^U} > 0 \qquad \Gamma'(.) > 0$$

2. Housing and asset prices are positively correlated along the business cycle and loan rates fall as housing prices rise:

$$\frac{\partial \tilde{R}_t^l}{\partial q_t} < 0 \qquad \tilde{R}_t^l = \frac{\left[\chi + (1 + \eta\mu_t) p_{t+1}^K\right]}{p_t^K} \frac{1}{(1 + \mu_t)} \left[1 + \Gamma(lev^u)\right]$$

$$p_t^K = f(q_t) \quad f'(.) > 0$$

Transmission Channels (ctd.)

3. Banks' operating costs are increasing in uninsured leverage. Providing larger, differentiated deposits with more associated benefits is more costly:

$$\frac{\partial \Psi(.)}{\partial lev_{t+1}^{U}} > 0$$

4. Depositors bargaining power is a function of the aggregate state of the economy. Monetary contraction $\rightarrow$ deposits fall $\rightarrow$ depositors power rises:

$$\frac{\partial \epsilon_{t+1}}{\partial q_t} < 0$$

Insured Deposits and Monetary Policy

$$\frac{\partial p_t^I}{\partial q_t} = -\frac{1}{(\tilde{R}_t^I)^2}\frac{1}{[1-\Psi(.)]}\frac{\partial \tilde{R}_t^I}{\partial q_t} > 0$$

Since $\frac{\partial \tilde{R}_t^I}{\partial q_t} < 0$

We now study how the elasticity of deposit prices to asset prices depends on how leveraged (in the market for uninsured deposits) banks are:

$$\frac{\partial^2 p_t^I}{\partial q_t \partial lev_{t+1}^U} = \frac{1}{[1-\Psi(.)]}\frac{1}{(\tilde{R}_t^I)^4} 2\tilde{R}_t^I \frac{\partial \tilde{R}_t^I}{\partial q_t}\frac{\partial \tilde{R}_t^I}{\partial lev_{t+1}^U} - \\ -\frac{1}{[1-\Psi(.)]}\frac{1}{(\tilde{R}_t^I)^2}\frac{\partial^2 \tilde{R}_t^I}{\partial q_t \partial lev_{t+1}^U} - \\ -\frac{1}{(\tilde{R}_t^I)^2}\frac{\partial \tilde{R}_t^I}{\partial q_t}\frac{1}{(1-\Psi(.))^2}\frac{\partial \Psi(.)}{\partial lev_{t+1}^U}$$

Uninsured Deposits and Monetary Policy

$$\frac{\partial p_t^U}{\partial q_t} = \frac{1}{[1-\Psi(.)]}\left\{-\frac{1}{(\tilde{R}_t^l)^2}\frac{\partial \tilde{R}_t^l}{\partial q_t} + \beta(1-\phi)\frac{\partial \epsilon_{t+1}}{\partial q_t}\right\}$$

The sign of this first partial derivative is ambiguous since $\frac{\partial \epsilon_{t+1}}{\partial q_t} < 0$ and $\frac{\partial \tilde{R}_t^l}{\partial q_t} < 0$. It would be unambiguously positive if the strength of depositors market power ϵ was not a function of the stance of monetary policy.

$$\frac{\partial^2 p_t^U}{\partial q_t \partial lev_{t+1}^U} =$$

$$\frac{1}{[1-\Psi(.)]}\left\{\frac{1}{(\tilde{R}_t^l)^4}2\tilde{R}_t^l\frac{\partial \tilde{R}_t^l}{\partial lev_{t+1}^U}\frac{\partial \tilde{R}_t^l}{\partial q_t} - \frac{1}{(\tilde{R}_t^l)^2}\frac{\partial^2 \tilde{R}_t^l}{\partial q_t \partial lev_{t+1}^U}\right\} +$$

$$+\left\{-\frac{1}{(\tilde{R}_t^l)^2}\frac{\partial \tilde{R}_t^l}{\partial q_t} + \beta(1-\phi)\frac{\partial \epsilon_{t+1}}{\partial q_t}\right\}\frac{1}{[1-\Psi(.)]^2}\frac{\partial \Psi(.)}{\partial lev_{t+1}^U}$$

Data

- We collect data for 2011-2025Q2 from multiple sources
  1. *RateWatch*: Deposit rates at bank-branch-account-week level
  2. *Call Reports*: Quarterly bank-level balance sheet and income statement data
  3. *Summary of Deposits*: Annual data on branch-level total deposits
  4. *County Business Patterns*: Monthly county-level data on unemployment from the Census Bureau

Deposit Rates and the Uninsured Deposit Premium

- We focus on the rates offered on **money market deposit accounts**
  - Most commonly offered savings account with "tiered" rates
  - Different rates for different minimum balance requirements ($MINTOEARN \geq \$250,000$ or $MINTOEARN < \$250,000$)
  - Not all banks offer both types of accounts (approx. 10% in 2011 and 70% in 2024)
- $PREMIUM_{it} = UNINSURED_{it} - INSURED_{it}$

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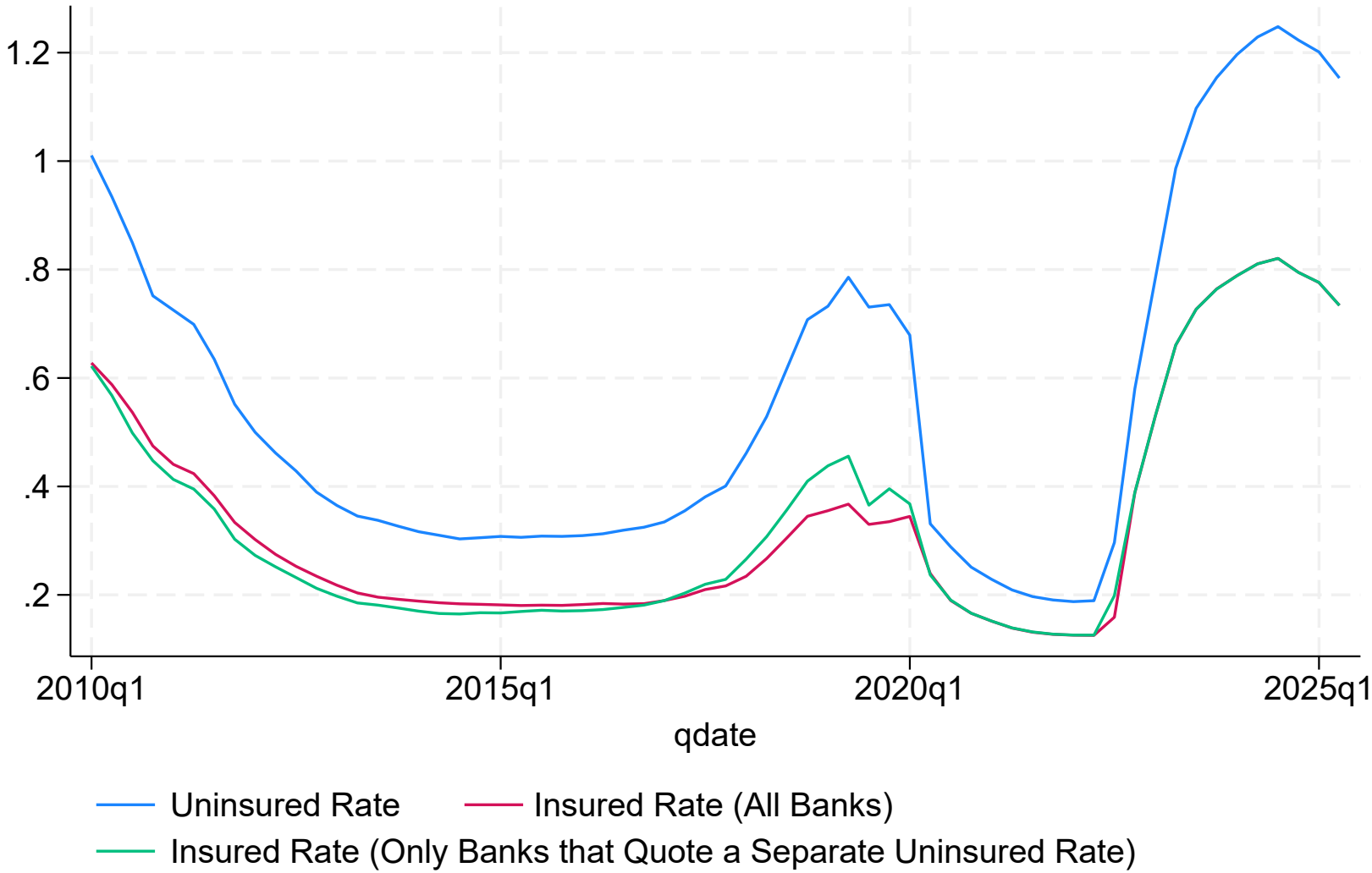
Insured vs. Uninsured MMDA Rates 2010-2025Q2



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- Uninsured deposits have a higher beta, since the premium rises (falls) during tight (loose) monetary policy

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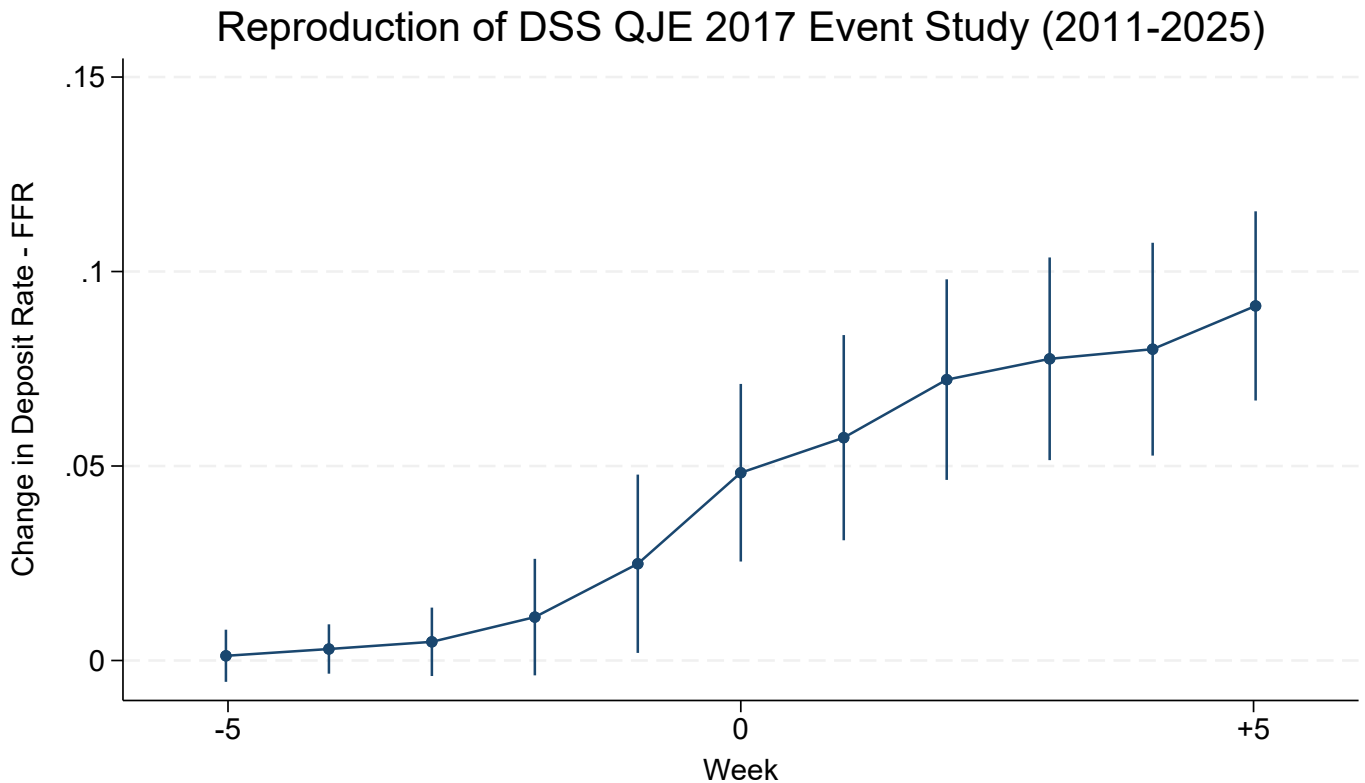
Uninsured Deposit Beta: An Event Study

- We replicate the event study in Drechsler, Savov and Schnabl (2017) and interact the change in the FFR with an indicator for if the account has $MINTOEARN \geq \$250,000$
- The coefficient on the interaction represents the "additional beta" of uninsured deposits



Call Report Data and Uninsured Deposits

- Uninsured deposits are not easy to measure $\rightarrow$ three definitions
- *BALANCES*: "Amount of deposit accounts of more than $250,000" (*RCONF*051 + *RCONF*047)
  - Also includes the insured component. Not a perfect measure
- *IMPUTED* = *BALANCES* - (# of accounts $>$ $250K)*$250,000
  - "Number of deposit accounts of more than $250,000" = (*RCONF*050 + *RCONF*048)
  - Assumes that all uninsured deposit accounts have similar balances, which is clearly not the case
- *REPORTED*: "Estimated amount of uninsured deposits in domestic offices of the bank ... including related interest accrued and unpaid" (*RCON*5597)
  - Only completed by banks with total assets greater than $1 billion

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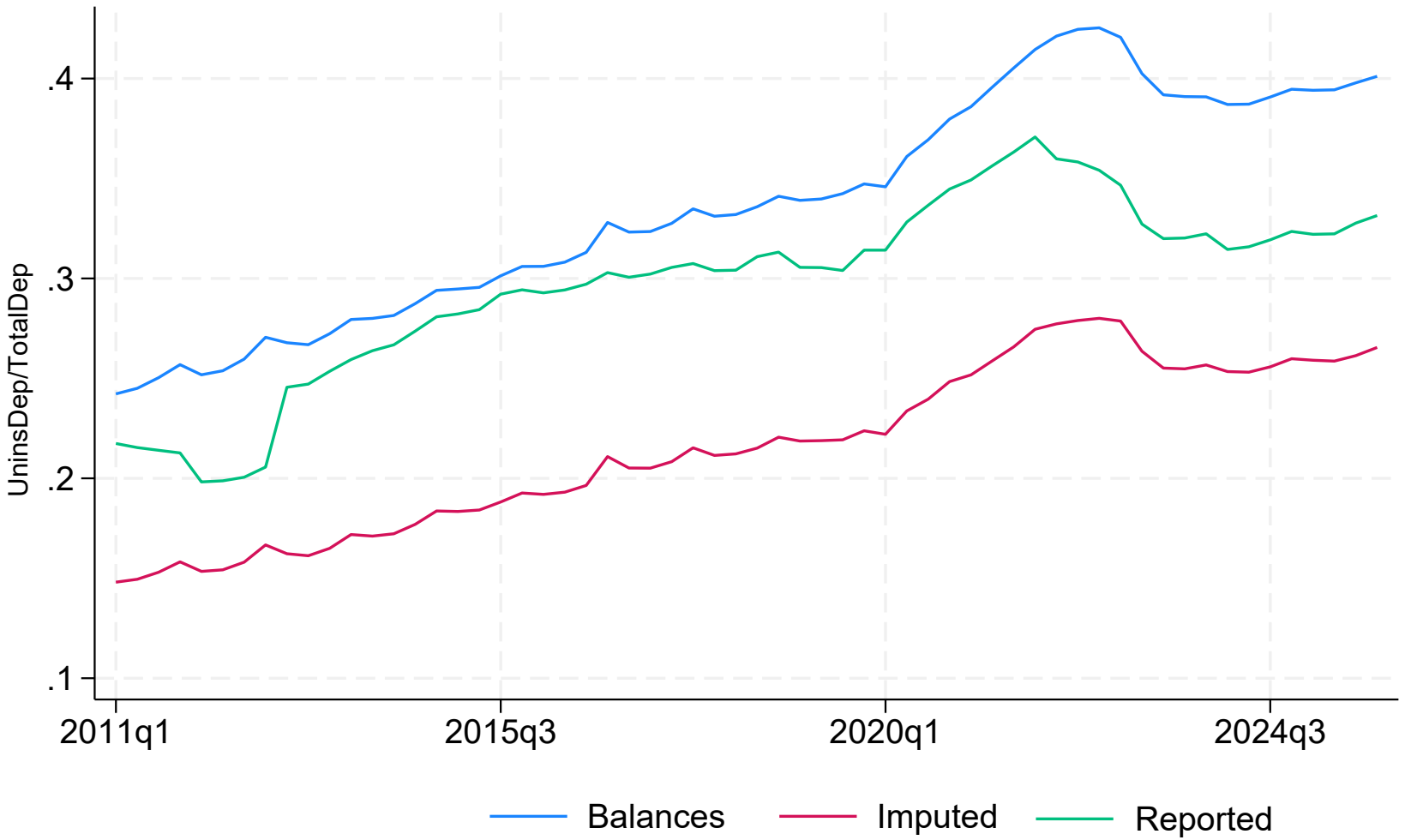
Average Share of UD - Three Definitions



Bank Characteristics

- We use standard bank characteristics like "total deposits", "total assets" and "total number of branches"
- We also account for whether a bank participates in a "reciprocal deposit network" to make its uninsured deposits effectively insured (market-based deposit insurance system - Kim, Kundu and Purnanandam, 2024)
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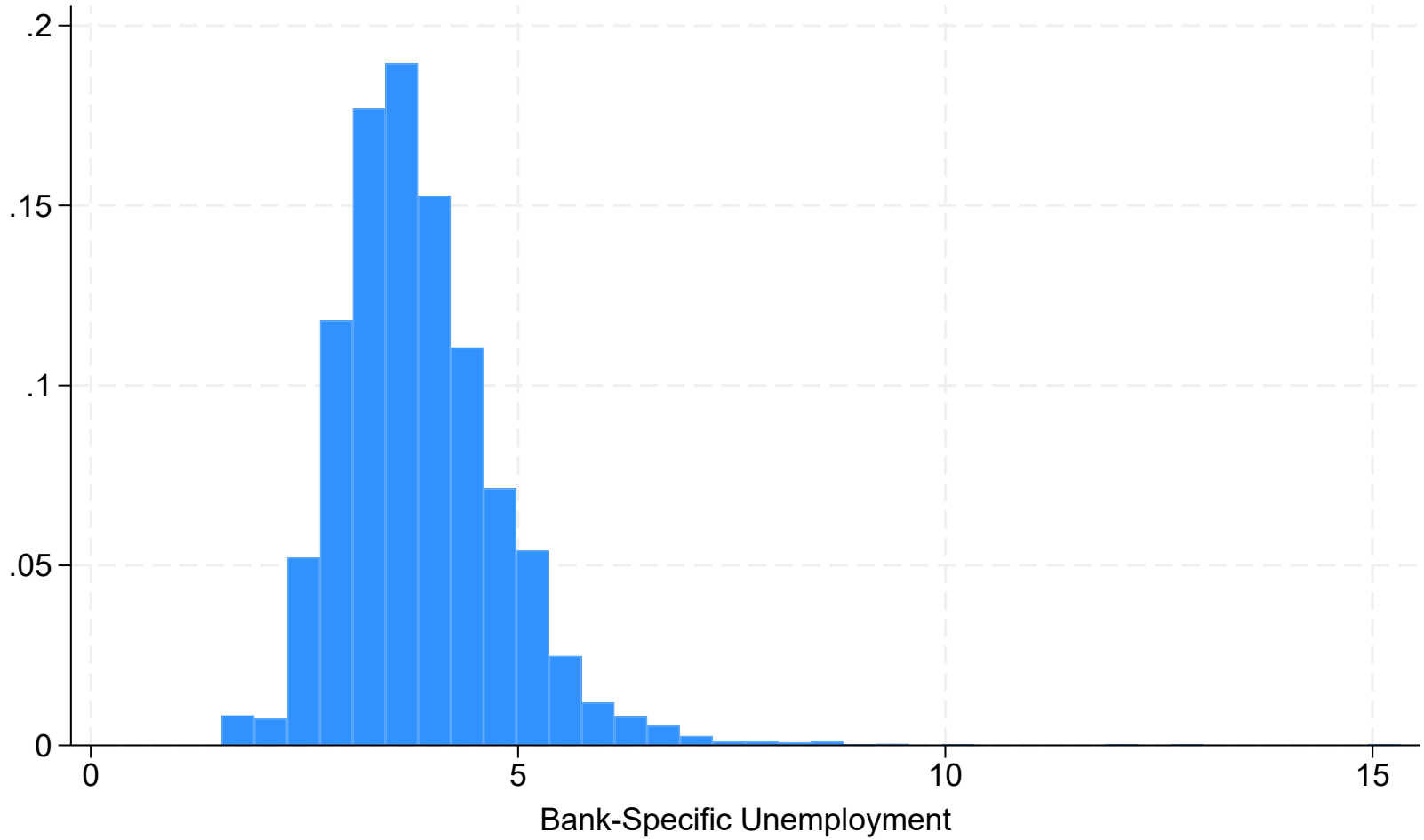
Bank-Specific Unemployment Rate in 2025Q2



(National Rate = 4.1%)

Empirical Analysis

- Empirical model founded in the testable implications from the theoretical model (eqs. for p_t^I and p_t^U):

$$\begin{aligned}
\Delta Rate_{it} &= \sum_{\tau=-1}^{1} \rho_\tau \Delta FFR_{t-\tau} + \sum_{\tau=-1}^{1} \gamma_\tau \left(\frac{UninsuredDep}{TotalDep} \right)_{it-1} \Delta FFR_{t-\tau} \\
&+ \beta_1 \left(\frac{UninsuredDep}{TotalDep} \right)_{it-1} + \beta_2 Unemp_{it} + \beta_3 ln(Deposits)_{it} \\
&+ \beta_4 ln(Assets)_{it} + \beta_5 ln(Branches)_{it} + \beta_6 Network_{it} + \alpha_i \\
&+ \epsilon_{it}
\end{aligned}$$

Empirical Analysis - Continued

- The main coefficients of interest are:
  - ρ: Deposit beta for a change in the FFR ("base effect").
  - γ: Additional deposit beta due to bank's use of uninsured deposits ("extra effect").
- $\tau = -1$, $\tau = 0$, and $\tau = 1$ are the quarters before, during and after a change in the FFR, respectively.
- As in DSS, we look at cumulative values for ρ and γ
- Given our three different definitions for *UD*, we run each specification three times.

Regression Results: Cumulative Deposit Betas

Panel A: Insured Deposit Rate	Balances N: 171,226	Imputed N: 171,224	Reported N: 24,588
Base: $\sum_{\tau=-1}^{1} \rho_\tau$	0.051***	0.067***	0.126***
	(0.007)	(0.008)	(0.016)
Extra: $\sum_{\tau=-1}^{1} \gamma_\tau (\overline{\frac{UninsuredDep}{TotalDep}})$	0.035***	0.021***	-0.012**
	(0.009)	(0.005)	(0.005)
Total: $\sum_{\tau=-1}^{1} \rho_\tau + \sum_{\tau=-1}^{1} \gamma_\tau (\overline{\frac{UninsuredDep}{TotalDep}})$	0.085***	0.087***	0.114***
	(0.009)	(0.011)	(0.015)
Panel B: Uninsured Deposit Rate	**Balances N: 69278**	**Imputed N: 69276**	**Reported N: 14555**
Base: $\sum_{\tau=-1}^{1} \rho_\tau$	0.081***	0.105***	0.205***
	(0.022)	(0.023)	(0.021)
Extra: $\sum_{\tau=-1}^{1} \gamma_\tau (\overline{\frac{UninsuredDep}{TotalDep}})$	0.058***	0.035***	-0.029**
	(0.011)	(0.007)	(0.011)
Total: $\sum_{\tau=-1}^{1} \rho_\tau + \sum_{\tau=-1}^{1} \gamma_\tau (\overline{\frac{UninsuredDep}{TotalDep}})$	0.139***	0.141***	0.175***
	(0.022)	(0.023)	(0.022)

($UninsuredDep/TotalDep$ is measured at the sample median)

Deposit Rate Regression Results Overview

- Uninsured deposits have a higher beta
- Banks' uninsured leverage impacts *both* the insured *and* uninsured β
- However, direction still unclear (depending on definition used)
- This is not a bank size issue. Re-estimating the first two specifications only for banks with assets $>$ \$1 billion doesn't change the pattern

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(Initial) Quantity Regression Results

Panel A: Change in Insured Deposits	Balances	Imputed	Reported
Base: $\sum_{\tau=-1}^{1} \rho_\tau$	-0.024***	-0.018***	-0.013*
	(0.007)	(0.006)	(0.007)
Extra: $\sum_{\tau=-1}^{1} \gamma_\tau (\overline{\frac{UninsuredDep}{TotalDep}})$	0.015***	0.006***	0.011**
	(0.003)	(0.001)	(0.005)
Total: $\sum_{\tau=-1}^{1} \rho_\tau + \sum_{\tau=-1}^{1} \gamma_\tau (\overline{\frac{UninsuredDep}{TotalDep}})$	-0.009	-0.012**	-0.002
	(0.006)	(0.006)	(0.008)
Panel B: Change in Uninsured Deposits	**Balances**	**Imputed**	**Reported**
Base: $\sum_{\tau=-1}^{1} \rho_\tau$	-0.042***	-0.039***	-0.013
	(0.012)	(0.012)	(0.014)
Extra: $\sum_{\tau=-1}^{1} \gamma_\tau (\overline{\frac{UninsuredDep}{TotalDep}})$	0.008	0.008	-0.014
	(0.008)	(0.005)	(0.008)
Total: $\sum_{\tau=-1}^{1} \rho_\tau + \sum_{\tau=-1}^{1} \gamma_\tau (\overline{\frac{UninsuredDep}{TotalDep}})$	-0.033***	-0.031***	-0.027**
	(0.009)	(0.011)	(0.011)

($UninsuredDep/TotalDep$ is measured at the sample median)

Conclusion

- We take the first steps towards investigating the implications of uninsured deposits for the transmission of monetary policy.
- Motivated by a theoretical model of the bank liabilities channel extended to account for uninsured deposits.
- We confirm the implications of the model that a bank's reliance on uninsured deposits ("uninsured leverage") has an impact on the bank's deposit beta
- This seems to also have an impact on the supply of insured deposits.
- Next steps: Implications for lending and economic activity