



The Federal Home Loan Banks and their Role in Mortgage Finance

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Ψ The analysis and conclusions set forth are those of the author and do not indicate concurrence by other members of the research staff or the Board of Governors. References in publications to this presentation should be cleared with the author.

Setting the Stage

- ❖ In September 2008, the government takeover of Fannie Mae and Freddie Mac trained a spotlight on housing-related government-sponsored enterprises (GSEs) that have rarely received much attention, but that help keep credit flowing through the economy.
 - The Federal Home Loan Banks (FHLBs) exist to help finance housing and community lending.
 - They borrow money in capital markets, securing low rates because of their implied backing by the federal government and lend that money to banks and thrifts.
 - As of December 31, 2008, the FHLB System had consolidated assets of \$1.35 trillion because it had borrowed larger amounts of money in capital markets as banks' and thrifts' traditional funding sources dried up, securitization markets ceased, and mortgage assets plummeted in value.

Today's Topics

- ❖ What are Federal Home Loan Banks (FHLBs)?
- ❖ What services are provided to FHLB members?
- ❖ Who are FHLB members?
- ❖ What was the role of the FHLBs during the credit crisis?
More specifically,
 - Did FHLBs provide liquidity to commercial banks?
 - Did FHLBs help increase mortgage credit?
 - Did FHLB advances help to insulate bank portfolios against unexpected changes in gross domestic product (GDP)?

What are Federal Home Loan Banks?

- ❖ The FHLB System was created in 1932 and consists of a collection of 12 regional cooperatively owned wholesale banks and an Office of Finance that acts as the FHLBs gateway to capital markets.
- ❖ Their statutory mission is to provide their members financial products and services to assist and enhance members' financing of
 - housing, and
 - community lending.
- ❖ Today, I will focus on their role in mortgage finance.

What Services are Provided to Federal Home Loan Bank Members?

- ❖ The FHLBs primarily achieve their mission by making collateralized loans—known as advances—that are generally collateralized by whole mortgage loans, mortgage-backed securities, US Treasury securities, and Agency securities.
 - These advances typically comprise about 70 percent of FHLB System assets.

- ❖ Other FHLB services include:
 - Acquiring member assets (e.g., mortgages);
 - Stand-by letters of credit;
 - Intermediary derivative contracts;
 - Debt or equity investments that primarily benefit households below 80 percent of median income.

Where do the Federal Home Loan Banks get the Money to Fund the Advances?

- ❖ About 95 percent of the consolidated asset portfolio of the FHLB System is funded by debt.
 - ❖ Almost all of it takes the form of consolidated obligations issued by the Office of Finance.
- ❖ About 5 percent of the consolidated asset portfolio of the FHLB System is funded through equity capital.
 - ❖ Most of the equity capital is derived from mandatory member stock subscriptions.
 - ❖ Retained earnings account for only six percent of the System's total equity capital.

Who are Federal Home Loan Bank Members?

- ❖ Membership is open to all depository institutions with more than 10 percent mortgage assets and also to community financial institutions (i.e., those with assets less than an inflation-adjusted threshold that equaled \$587 million as of December 2005).
- ❖ Over 8,000 financial institutions are currently members of the FHLB System.
 - More than half of FHLB advances outstanding are to commercial bank members and these advances are concentrated in the largest members.
 - Commercial banks with greater than \$1 billion in total assets – institutions that typically have many sources of wholesale funding – hold more than 40 percent of FHLB advances outstanding.

Who uses Federal Home Loan Bank Advances?

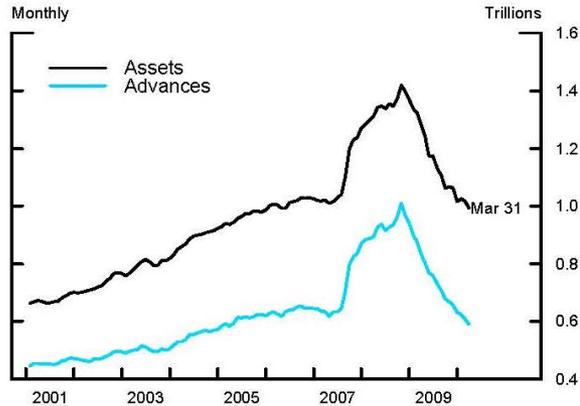
FHLB Thrift and Commercial Bank Members: 2010 Q1

Asset Category	Number of Entities	Number of Borrowers	Advances Outstanding (Billions)	% of FHLB Advances
Thrifts				
1) Less than \$10 Billion	1155	867	56	10
2) \$10 Billion or more	30	26	92	17
Commercial Banks				
3) Less than \$10 Billion	5754	4080	115	21
4) \$10 Billion or more	86	73	221	40
Memo: Top 10 Institutions				
Thrifts	10	10	79	14
Commercial Banks	10	10	149	27

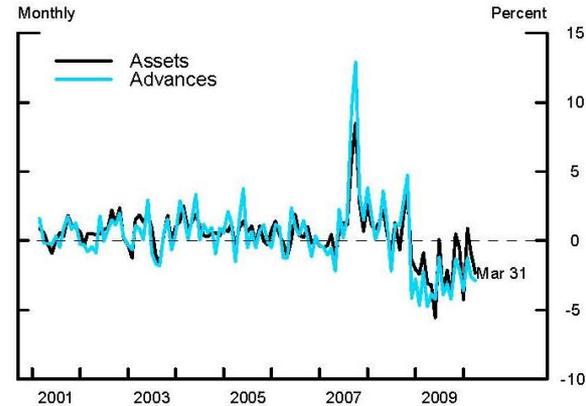
Source: Federal Housing Finance Board

How Did the Balance Sheet of the Federal Home Loan Bank System Evolve During the Credit Crisis?

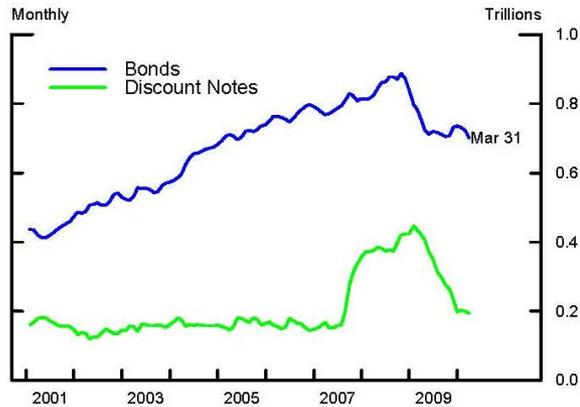
FHLB Total Assets and Advances



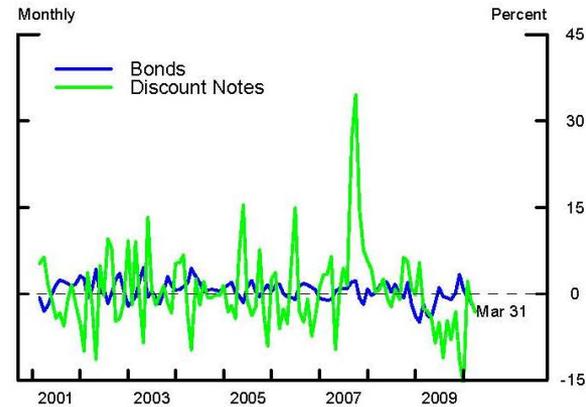
Change in Assets and Advances



FHLB Bonds and Discount Notes

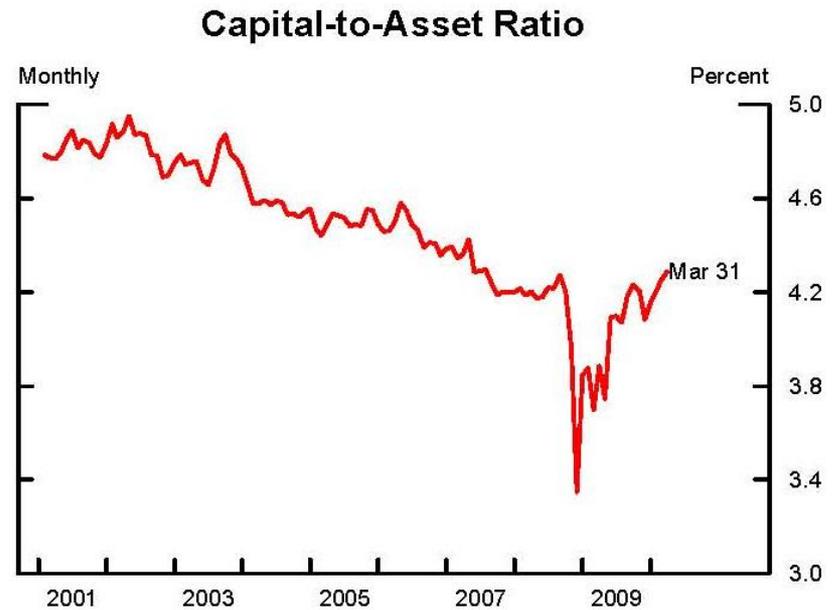
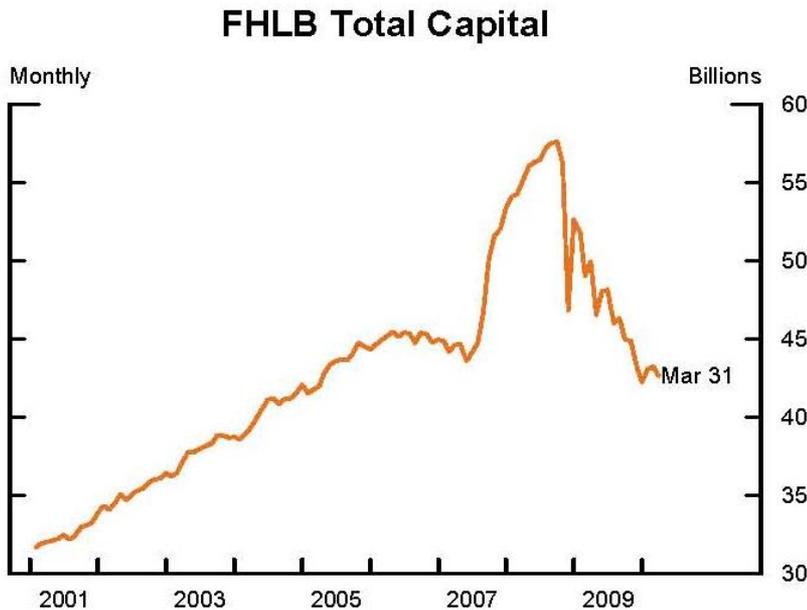


Change in Bonds and Discount Notes



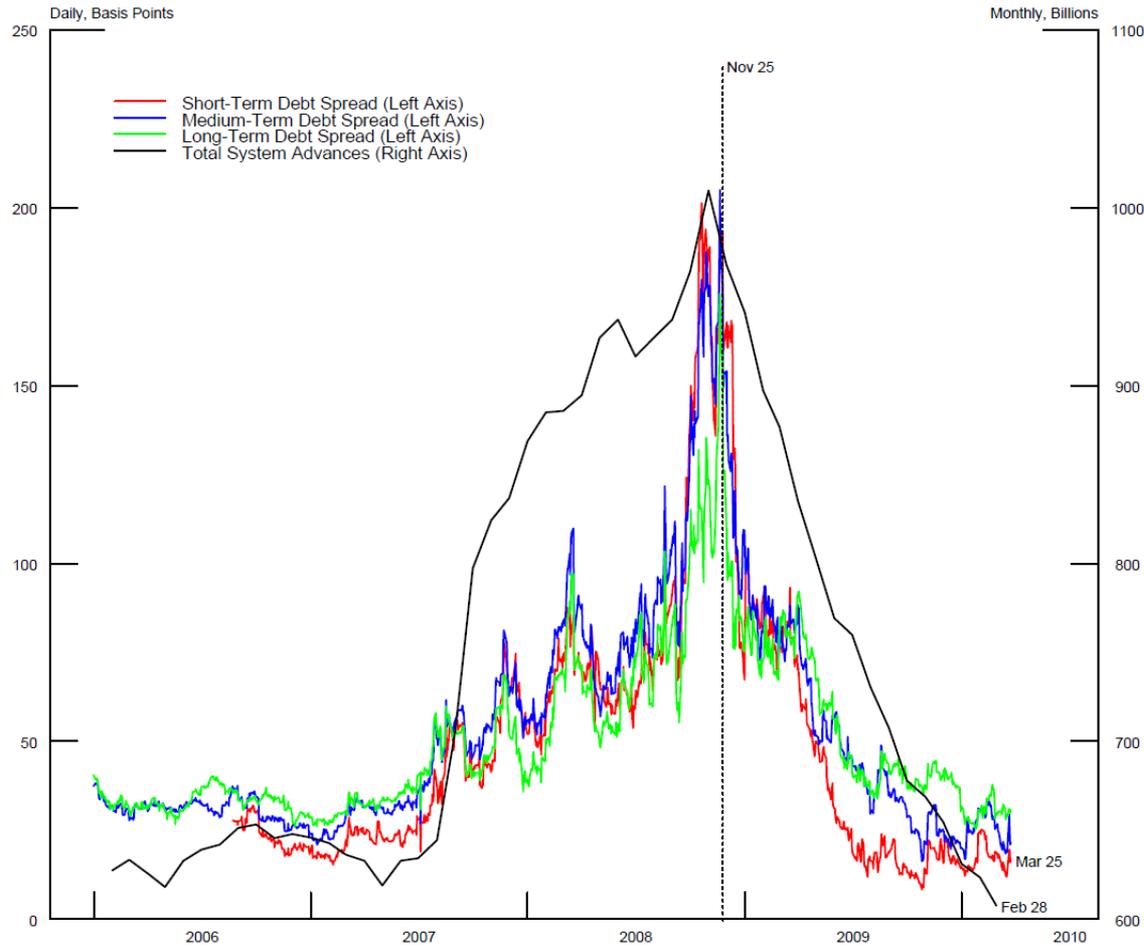
Source: Federal Housing Finance Board

How Did the Capitalization of the Federal Home Loan Bank System Evolve During the Credit Crisis?



Source: Federal Housing Finance Board

What Happened to FHLB Borrowing Costs During the Credit Crisis?



On November 24, 2008, the Federal Reserve announced that it would purchase GSE debt and agency MBS.

Sources: Bloomberg, Federal Housing Finance Board, Merrill Lynch

*Short-term securities have 1-3 years remaining maturity, medium-term securities have 3-5 years remaining maturity, and long-term securities have 5+ years remaining maturity

What Do We Do?

- ❖ Wayne Passmore and I have developed an empirical model of the banking system.
 - It is a dynamic model.
 - It estimates how bank portfolios respond to unanticipated changes in the macro-economy.
 - It estimates how unanticipated changes in bank liabilities (e.g., FHLB advances) affect loans held on the balance sheet.
 - It estimates how unanticipated changes in loans, affects liabilities (e.g., FHLB advances).

- ❖ This model is estimated using panel-vector autogression (panel-VAR) techniques.

Why do we Use Panel-VAR Techniques to Estimate our Empirical Model of the Banking System?

- ❖ Banks typically make portfolio-wide but gradual, adjustments to their holdings of both financial assets and liabilities in response to unexpected events.
 - For example, using aggregate data, Bernanke and Blinder (1992) and Den Haan, Sumner, and Yamashiro (2004) estimate that interest rate shocks affect the size and composition of banks' portfolios for more than two years.
 - Analogously, Hancock and Wilcox (1995) use individual bank data to estimate that portfolio adjustments can take two to three years to complete after a bank capital shock.
- ❖ Bank portfolio adjustments are gradual and have differing speeds across balance sheet categories because of:
 - institutional inertia,
 - the complexity of loan documentation,
 - the difficulty of judging the quality of loan applicants,
 - the speed with which loan applicants alter their loan demand in response to changing circumstances; and
 - the relative liquidity of secondary markets for the different portfolio components.
- ❖ We use a panel-VAR technique to obtain banks' dynamic responses to portfolio and macroeconomic shocks because of the ability of this type of model to approximate complicated, interdependent adjustment paths with fairly short time-series information.

What Data Do We Use?

❖ We use quarterly Call Reports for domestically-chartered commercial banks;

- Residential mortgage loans (MORT);
- Other real estate loans (OREL);
- Commercial and industrial loans (C&I);
- Deposits (DEP);
- Securities (SEC);
- Federal Home Loan Bank advances (ADV);
- Capital (K)

❖ We also use quarterly macroeconomic variables;

- Short-term interest rate (measured by federal funds rate, FFR);
- Slope of yield curve (measured by the difference between the 10-year and one-year rates, YIELD);
- Economic activity (measured using real-time GDP)

How Do We Define a Bank?

- ❖ Because asset-liability management is typically centralized within a banking organization, we constructed asset and liability data at the “top holder” level.
 - A bank holding company, which is comprised of a lead bank and several subsidiary banks, would be the top holder of the banking organization.
 - A bank that is unaffiliated with any other bank is considered to be its own top holder organization.
- ❖ For ease of exposition, we refer to bank top holder entities as “banks.”

Size Stratification?

- ❖ Bank top holder entities were stratified into three size groups in each quarter:
 - Small top holders have total assets at or below the 50th percentile of the distribution of total assets;
 - Medium top holders have total assets between the 50th and 99th percentiles of the distribution of total assets; and
 - Large top holders have total assets at or above the 99th percentile of the distribution of total assets.
- ❖ These percentile cutoffs for the three top holder size groups allocate top holders such that about 40 percent of the sample is “small,” about 53.5 percent is “medium,” and 6.4 percent is “large” as of 2008:Q4.

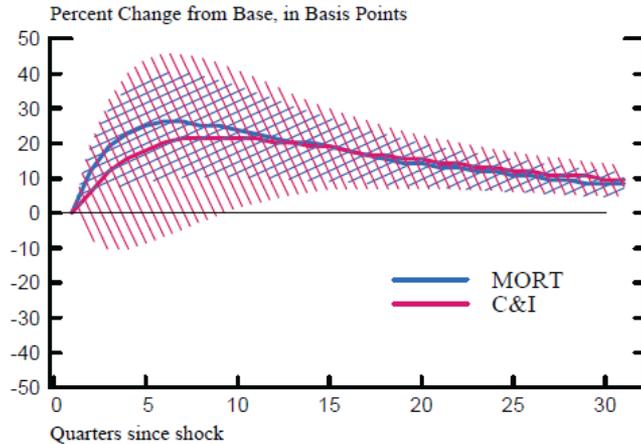
When?

- For each bank size group, we estimate the panel-VAR model over two periods:
 - Non-agency Securitization Boom Period
2001:Q1=2006:Q4
 - Credit Crisis Period
2007:Q1-2009:Q3

What Were the Bank Portfolio Responses to FHLB Advances Shocks?

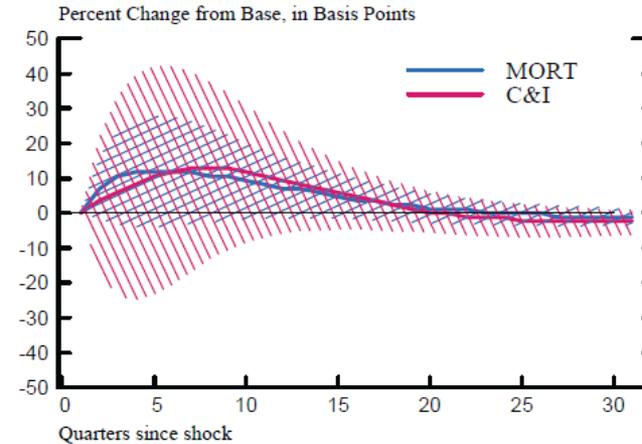
Non-agency Securitization Boom (2001:Q1-2006:Q4)

Small Top Holders with Advances

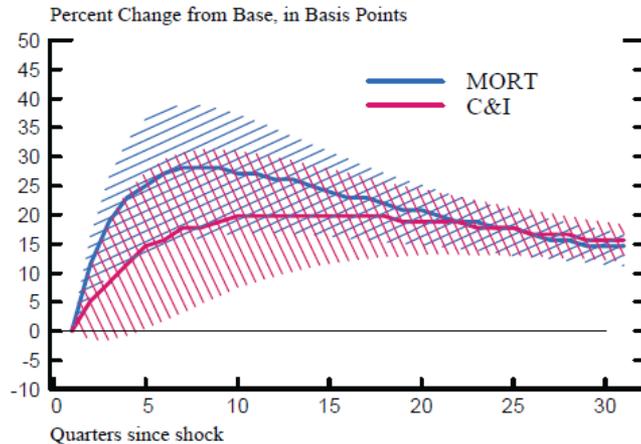


Crisis (2007:Q1-2009:Q3)

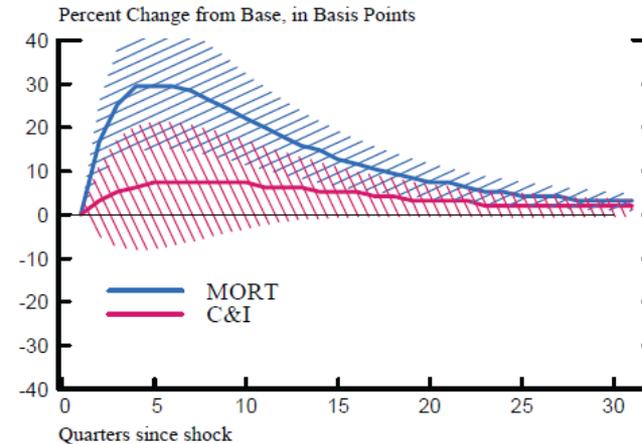
Small Top Holders with Advances



Medium Top Holders with Advances

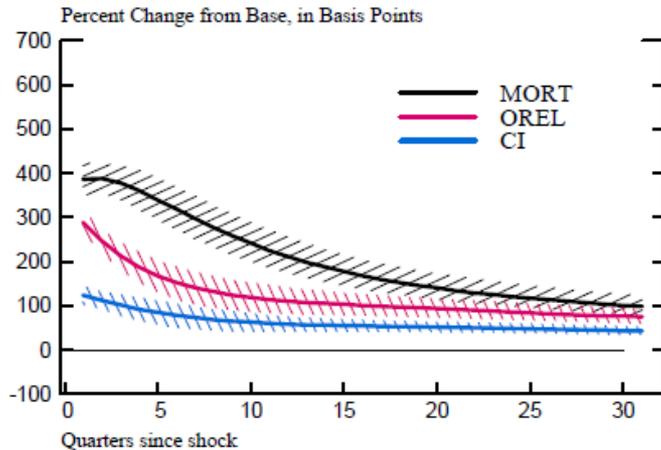


Medium Top Holders with Advances

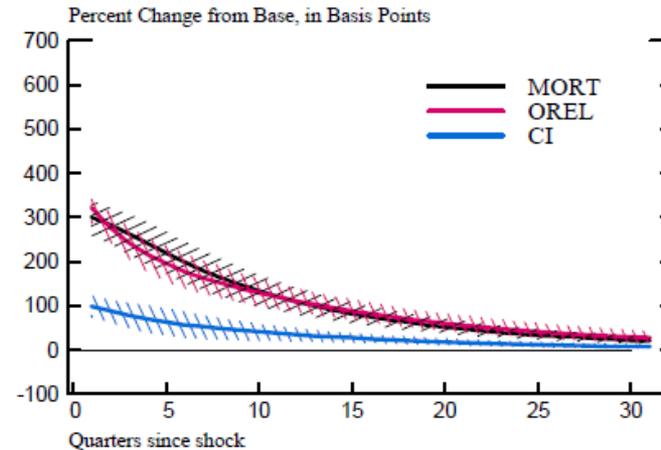


What Were the FHLB Advances Responses to Loan Shocks?

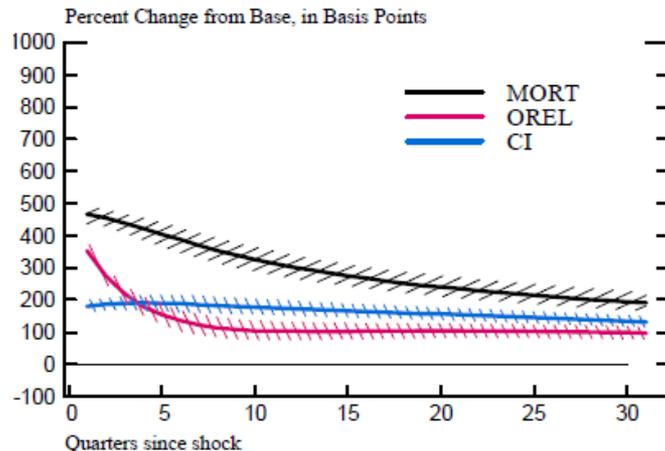
2001:Q1 - 2006:Q4
Small Top Holders with Advances



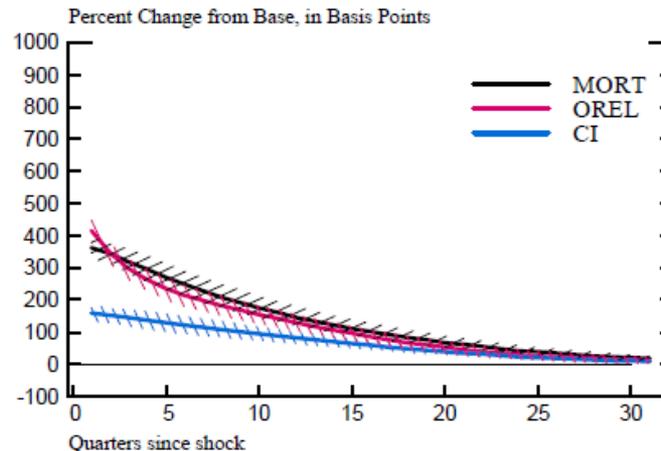
2007:Q1 - 2009:Q3
Small Top Holders with Advances



Medium Top Holders with Advances



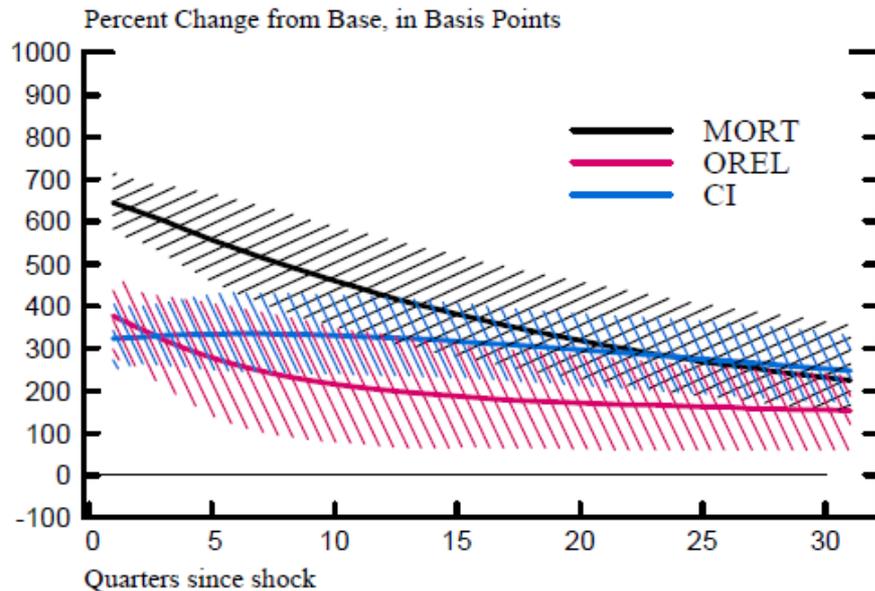
Medium Top Holders with Advances



Did Large Banks Have Similar FHLB Advances Responses to Loan Shocks?

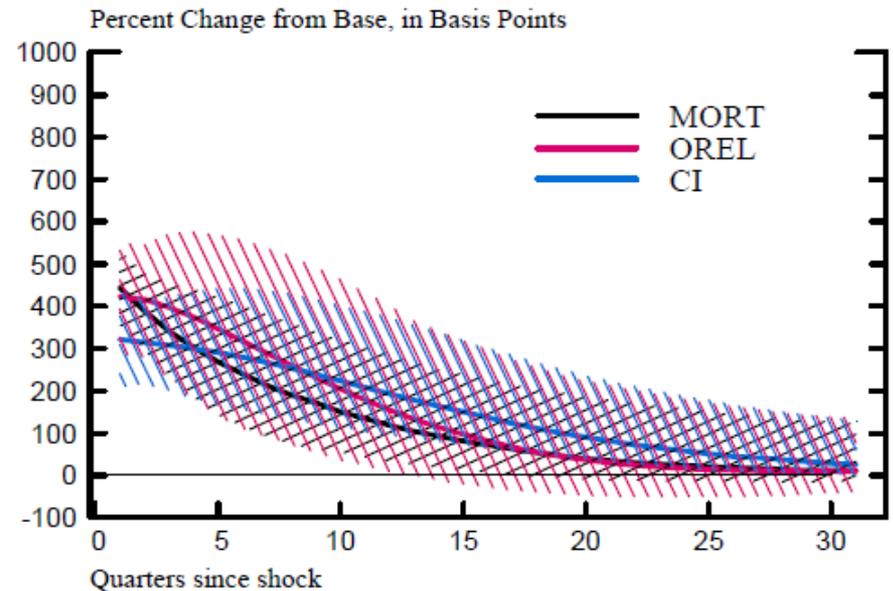
Non-agency Securitization Boom (2001:Q1-2006:Q4)

Large Top Holders with Advances



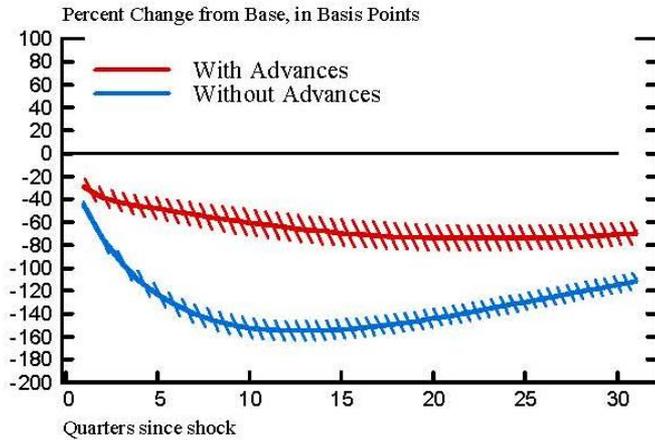
Crisis (2007:Q1 – 2009:Q3)

Large Top Holders with Advances

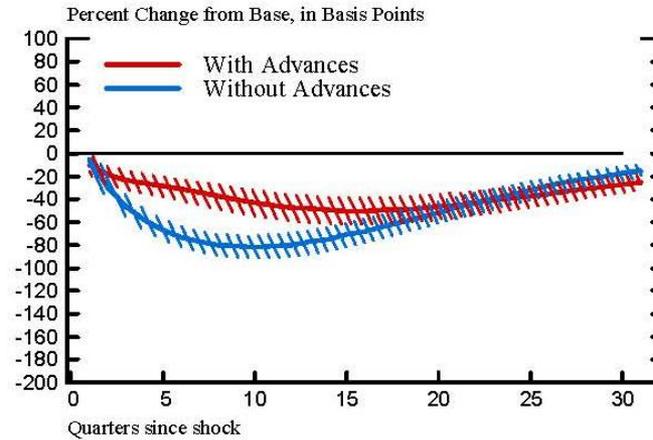


For Small Banks, Were FHLB Members' Loan Portfolios Less Sensitive to GDP Shocks?

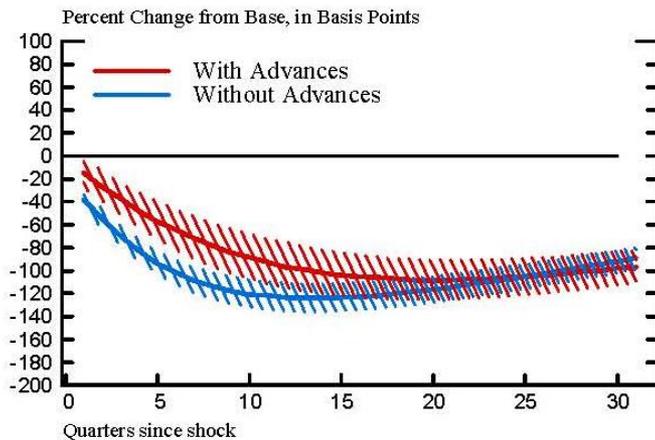
2001:Q1 - 2006:Q4
Mortgages



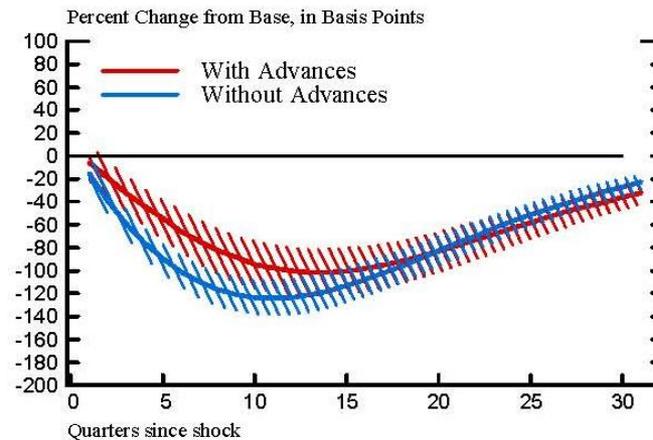
2007:Q1 - 2009:Q3
Mortgages



C&I Loans

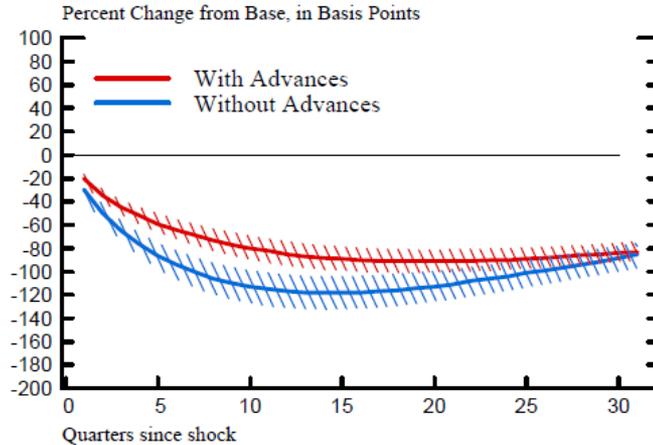


C&I Loans

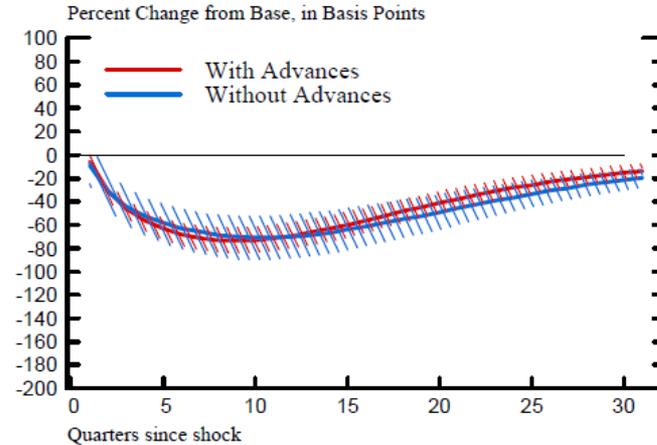


For Medium Banks, Were FHLB Members' Loan Portfolios Less Sensitive to GDP Shocks?

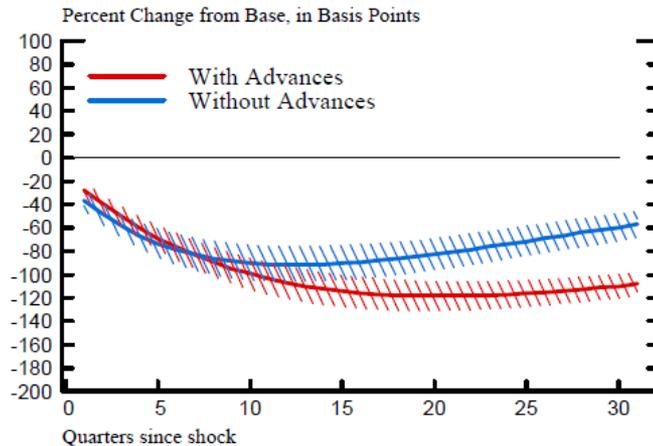
2001:Q1 - 2006:Q4
Mortgages



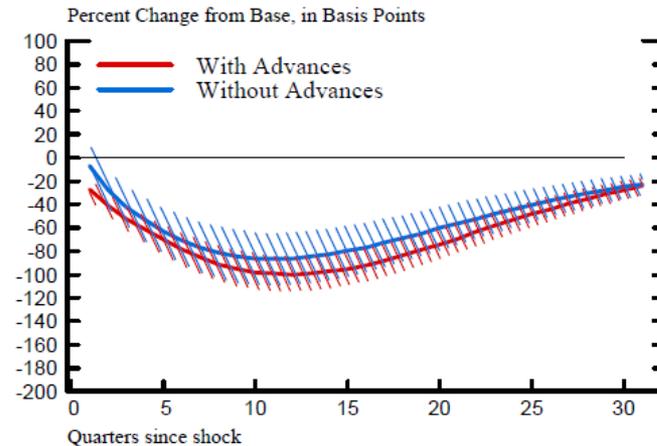
2007:Q1 - 2009:Q3
Mortgages



C&I Loans



C&I Loans



Federal Home Loan Banks and their Role in Mortgage Finance?

- ❖ Using panel-VAR techniques, we estimate recent dynamic responses of US bank portfolios to FHLB advance shocks, to bank lending shocks, and to GDP shocks. Our empirical findings are consistent with:
 - FHLB advances are being used as a general source of liquidity. That is, bank portfolio responses to an advance shock are similar for mortgages and for C&I loans.
 - Unexpected changes in all types of bank lending are accommodated using FHLB advances (not just mortgage lending).
 - Small banks appear to use FHLB advances to reduce variability in their residential mortgage lending and in their C&I lending that would result from GDP shocks.