Banking Globalization, Monetary Transmission, and the Lending Channel

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Main goals of paper

- Monetary policy effectiveness debated, but may be changing with globalization

- Our conjecture: globalization has deep impact on the lending channel

- Bottom Line: Rise of international banking is reducing the impact of monetary policy for domestic markets.

- But boosting transmission to international markets

- From a global perspective, lending channel is quite alive

Other insights relevant for recent events

- Banks utilize internal capital markets to offset shocks to parent liquidity or subsidiary liquidity

- For globally-oriented banks, this implies liquidity smoothing internationally

- In recent financial stresses, such liquidity transference has helped alleviate dollar funding needs where they arose.

- Mechanisms, such as swap agreements between central banks, help fill remaining gaps in funding needs.

Revisit the lending channel for monetary policy

- Seminal study by Kashyap and Stein (*AER* 2000) compares the effectiveness of the lending channel across types of banks.

  - Strong for small banks

  - Lending by large banks insulated from policy-induced liquidity shocks

- Our results: domestically-oriented large banks NOT insulated, only globally-oriented banks.

  - Foreign affiliates serve as liquidity hedges, and transmit US policy to affiliate markets through lending.

The lending channel at work

Bank balance sheet

↓ Liquid assets	Deposits ↓
↓ Loans	Other funds ↑
	Capital
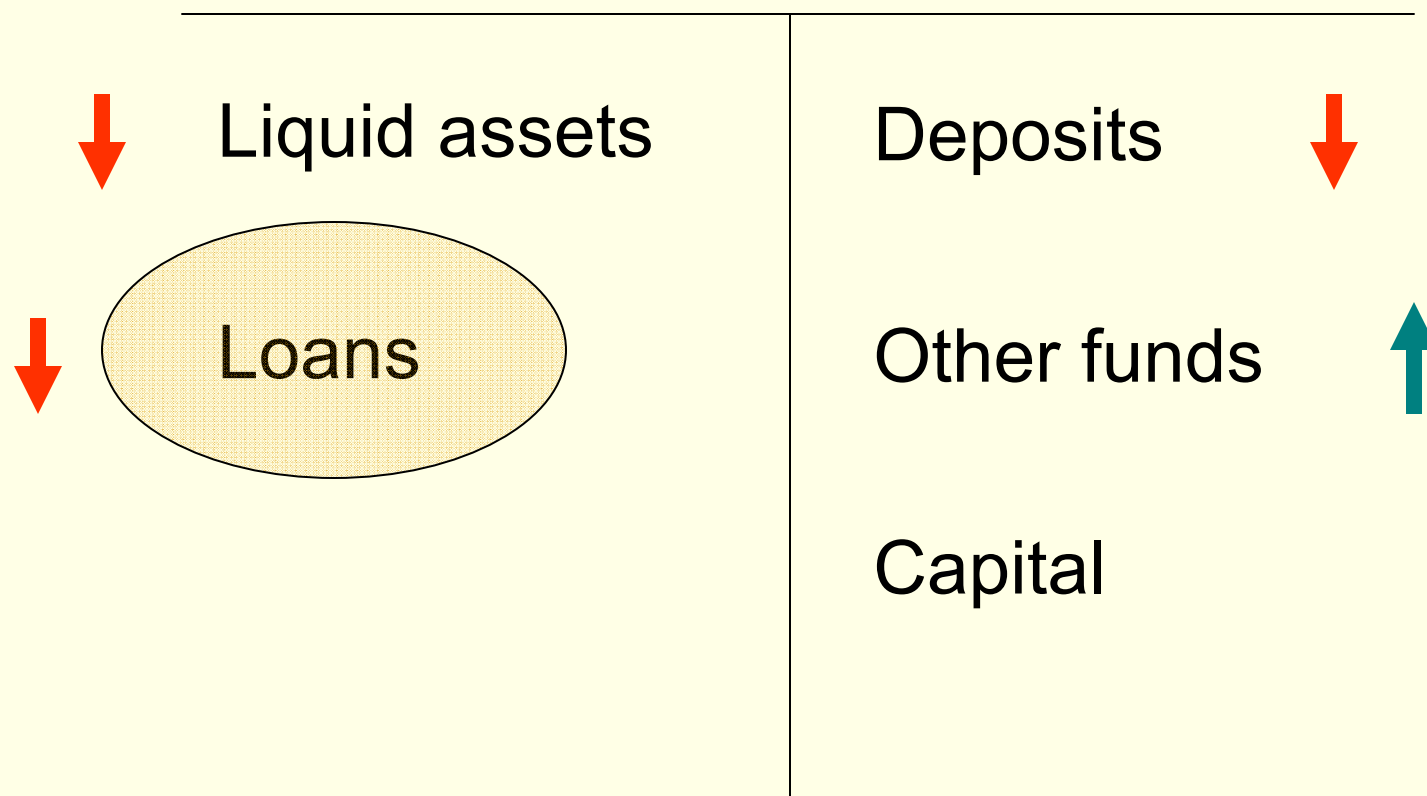
Kashyap and Stein (AER 2000)

Large banks	
Liquid assets	Deposits
Loans	Other funds
	Capital

Kashyap and Stein (AER, 2000)

Small banks

Liquid assets		Deposits
Loans		Other funds
		Capital
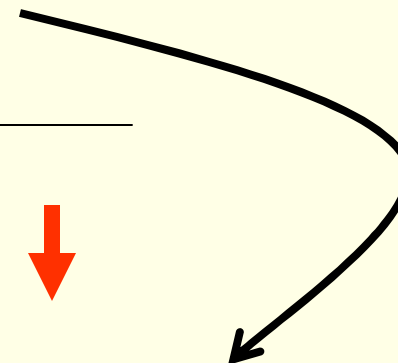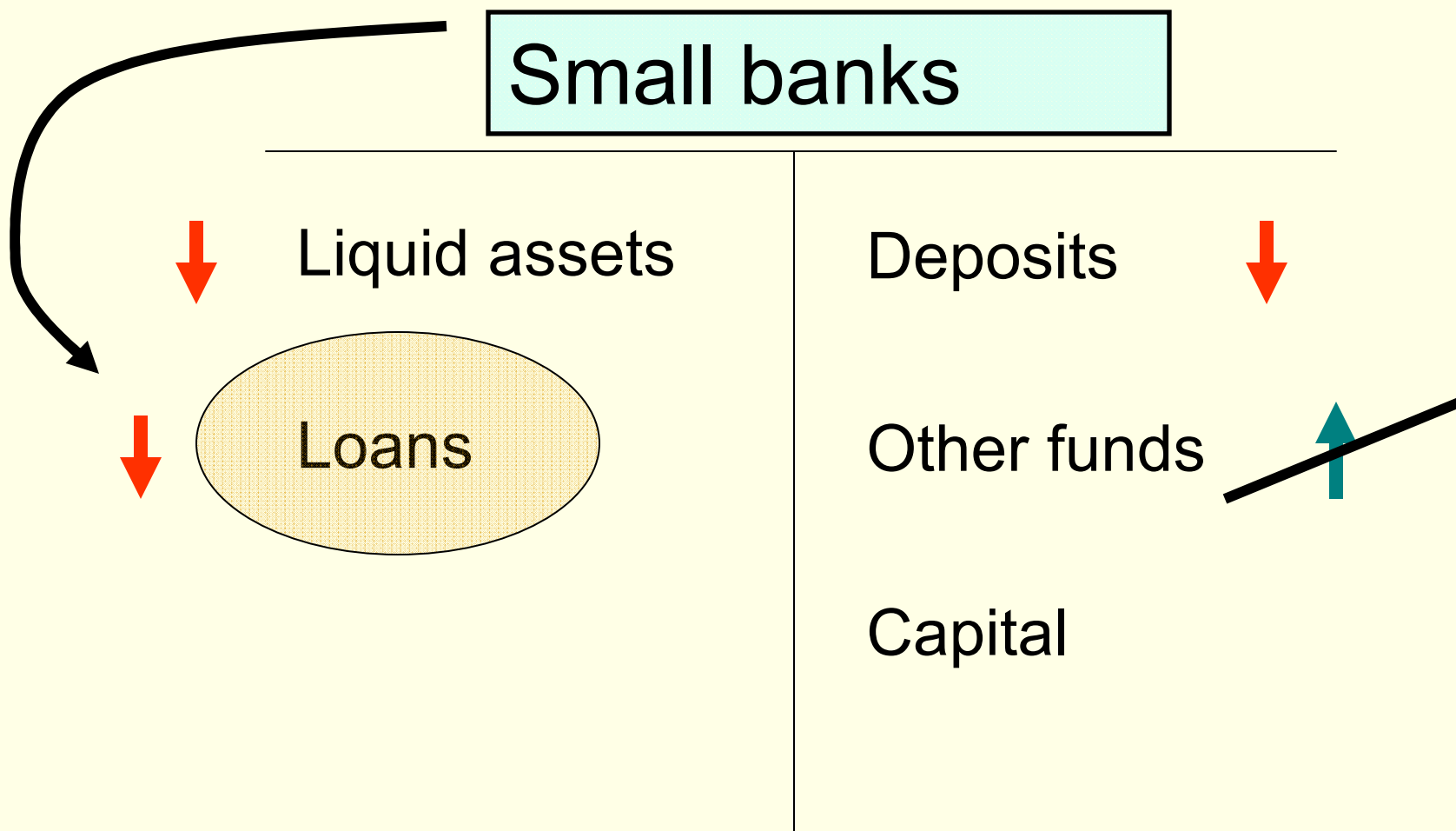
Campello (2002) shows that insulation properties of large banks can spillover to small banks through Bank Holding Companies (BHCs)

Response of large domestic vs. large global
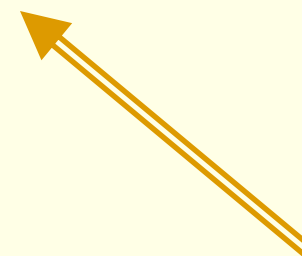
Response of large domestic vs. large global

Large global banks

Domestic balance sheet			Foreign balance sheet	
Domestic assets	Domestic liabilities		Foreign assets	Foreign liabilities
	Internal borrowing ←		Internal lending	

Why focus on global banking?

- Banking globalization at the highest levels ever

    - Global banks account for nearly 75% of total US bank assets

    - 25 % of global banks assets from foreign offices.

- Global banks have better diversification opportunities

- They can potentially activate an "internal capital market" between domestic and foreign offices

Figure 1
Share of total U.S. bank assets in globally-oriented U.S. banks
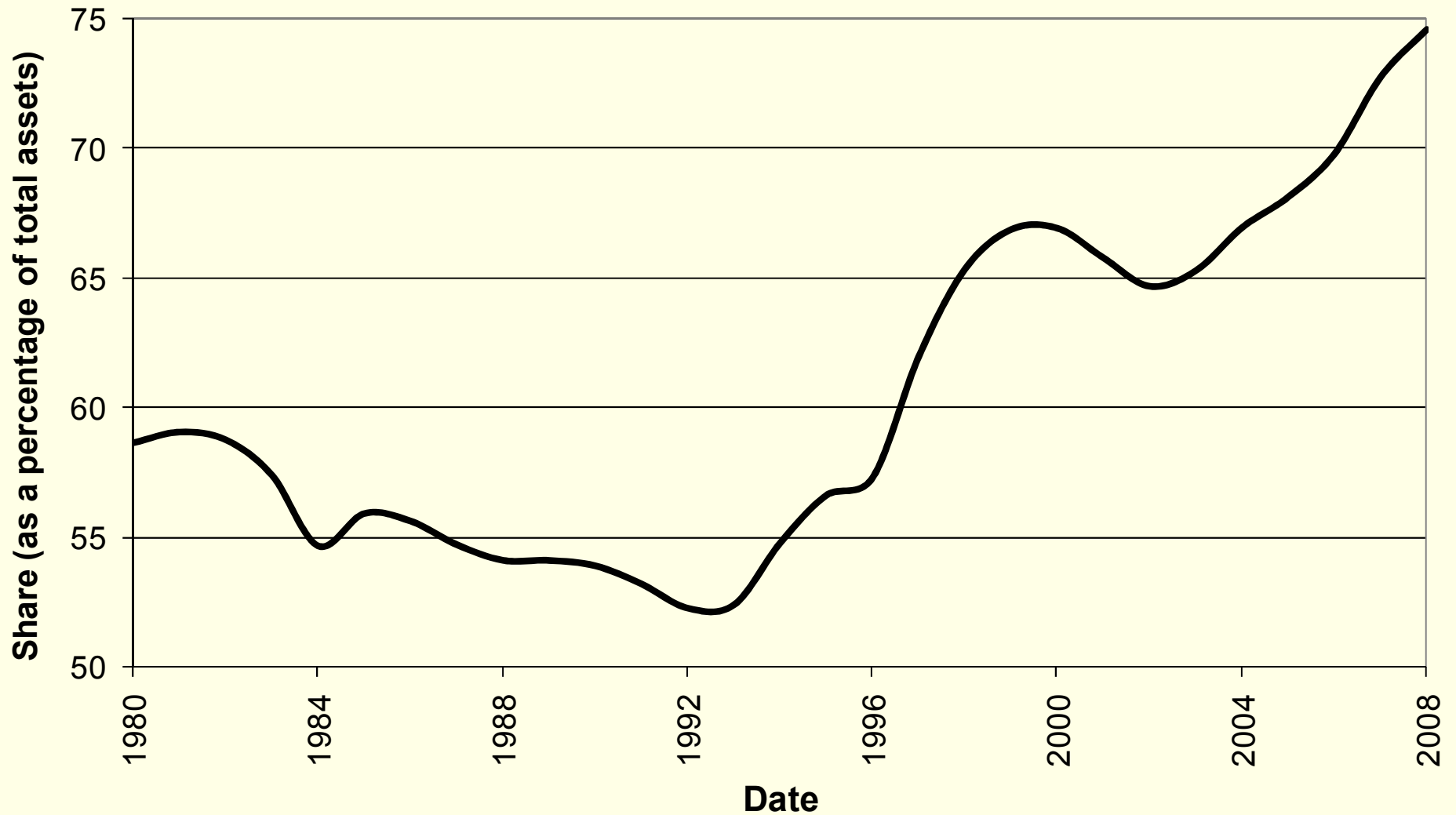
Source: Call Reports and FFIEC 009 reports filed by all U.S. reporting banks.
Notes: Shares for 2007 and 2008 are calculated by taking the average over the quarters of the corresponding years. Only the first two quarters available for 2008.

Figure 2
Share of foreign assets in total assets in globally-oriented U.S. banks

Source: Call Reports and FFIEC 009 reports filed by all U.S. reporting banks.
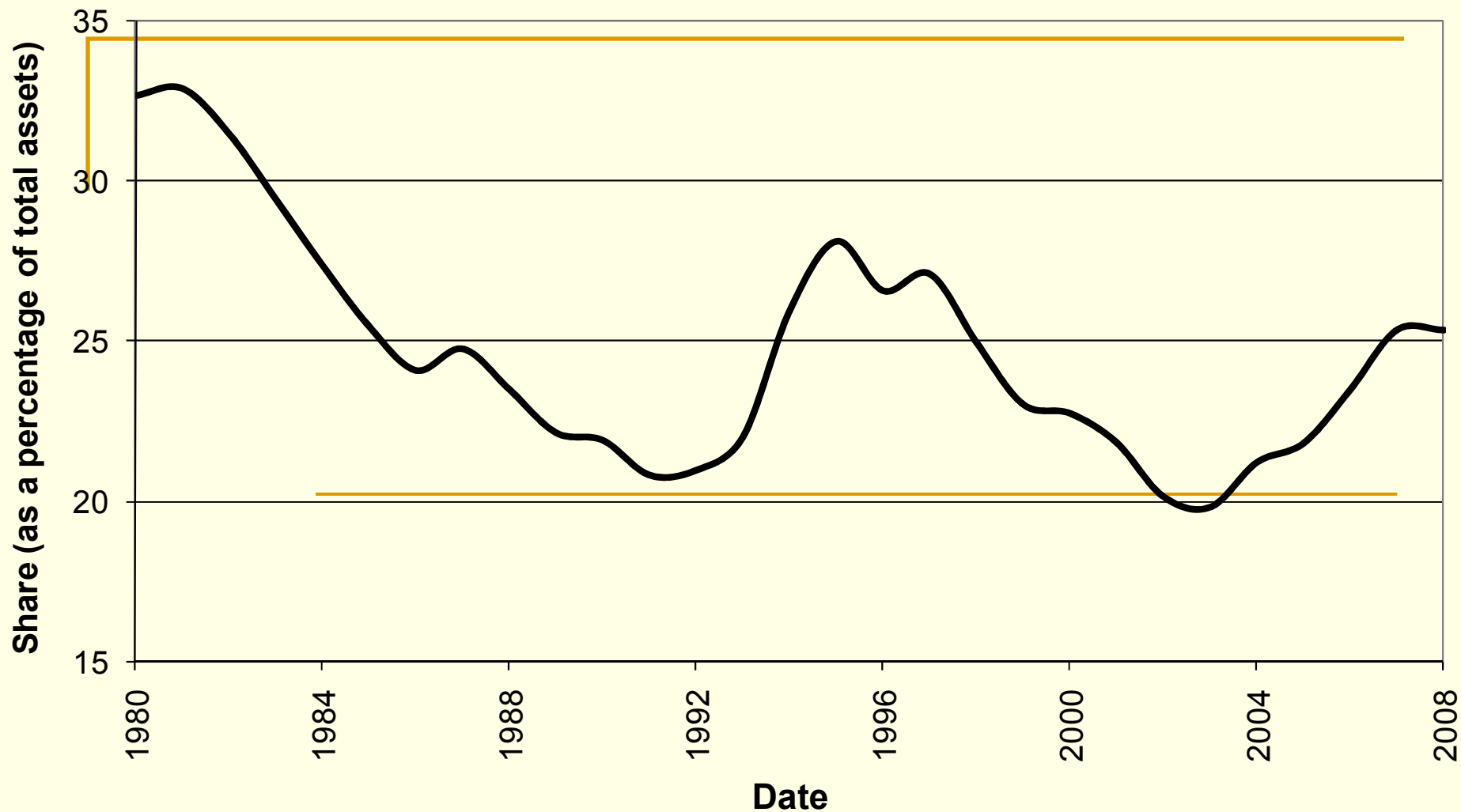Notes: Shares for 2007 and 2008 are calculated by taking the average over the quarters of the corresponding years. Only the first two quarters available for 2008.

Data

- <u>Banks.</u> Call report data, 1980Q1 through 2005Q4.

- Large bank≡ in the 95th percentile or higher of banks sorted by asset size, each quarter.

- Small bank ≡ is in the 90th percentile or lower.

  - Highly skewed asset distribution, so that even within the top 5 percent bracket there is a considerable size difference between banks in the top 1 percent and those between the 95th and the 99th percentile.

- Loans are either total loans, C&I loans, foreign loans

- Net due flows are direct between parent and affiliate

- Balance sheet liquidity and size measures

- <u>Monetary measures</u>: nominal Federal Funds rate, real Federal Funds rate, Bernanke-Mihov liquidity measure

Description of Sample of Banks

	All banks	Large domestic banks	Large global banks
Total number of bank observations (1980Q1-2005Q4)	1,162,969	43,921	14,252
Median values for bank asset size (thousands 2005USD)			
1985 CPI 146.3802641	62,269	996,951	5,123,663
2005 CPI 267.6469194	105,223	2,236,512	22,300,000
Share of each bank group in total assets (%)			
1985	100.0	16.6	56.0
2005	100.0	17.9	67.9
Median total loans / assets (%)	55.6	61.1	60.4
Median C&I loans / assets (%)	17.3	22.8	35.4
Median bank liquid assets / total assets (%)	28.0	26.5	20.1

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What we do

1. Compare large domestic banks to large global banks ("large" = top 5% in total assets)

What we do

- Based on Kashyap and Stein (2000) and Campello (2002)

$$(1) \quad \Delta \log(L_{it}) = \sum_{j=1}^{4} a_{tj} \Delta \log(L_{it-j}) + \beta_t Liquidity_{it-1} + \text{Controls} + \varepsilon_{it}$$

$$(2) \quad \beta_t = \eta + \sum_{j=1}^{8} \phi_j MP_{t-j} + \delta \text{Controls} + \mu_t$$

Liquidity is the log of the banks liquid assets relative to total assets.
Eq.1 Bank-specific Controls include bank capitalization ratio, asset size, value of NPLs lagged. Indicators for state where bank is located and the MSA of the headquarters to capture unobserved variability in loan demand.
Eq.2 Controls are time trend, quarterly indicator variables, growth real gdp with lags

Findings

1. Compare large domestic banks to large global banks

   - Large global banks are insulated from domestic monetary policy
   - Large, domestic-only banks are <u>not</u>.

     - A 100 bp increase in FF rate reduces C&I lending growth by 0.2 percentage points.
     - Comparable to K&S: 0.4 percent less (for small banks).

What we do

1. Compare large domestic banks to large global banks

2. Direct test of active internal capital market for global banks

What we do

Direct test for active internal capital market:

$$(3) \quad \Delta Net\ Due_{i,t} = \alpha + \sum_{j=1}^{4} \varphi_j \Delta Net\ Due_{i,t-j} + \sum_{j=0}^{4} \phi_j \Delta MP_{t-j} + \sum_{j=0}^{4} \gamma_j \Delta GDP_{t-j} + \mu_t$$

Call report item: "Net Due To/From Own foreign offices"

Measure total liabilities/claim of the head office with its foreign offices

Findings

1. Compare large domestic banks to large global banks

2. **Direct test of active internal capital market for global banks**

   - Global banks activate a significant internal capital market in response to domestic monetary policy

     - In 2005q4: A 100 bp increase in FF rate increases internal borrowing from foreign offices by $47 ML.
     - Median change in net due flows = $15 ML
     - Imputed loss in lending for median large and global = $63 ML

What we do

1. Compare large domestic banks to large global banks

2. Direct test of active internal capital market for global banks

3. Response of lending of _foreign offices_ to U.S. monetary policy

   ❑ Measure reliance of foreign office lending on balance sheet strength of head office. In times of domestic liquidity contractions foreign offices can rely **_less_** on head office.

Findings

1. Compare large domestic banks to large global banks

2. Direct test of active internal capital market for global banks

3. Response of lending of *foreign offices* to U.S. monetary policy

   - Lending of foreign offices highly affected by domestic monetary policy

   - Indication of international transmission of monetary policy

What we do

1. Compare large domestic banks to large global banks

2. Direct test of active internal capital market for global banks

3. Response of lending of *foreign offices* to U.S. monetary policy

4. Does insulation of the large bank extend to small banks affiliated via BHC (Campello, 2002)?
   - It does for small domestic affiliates of large and global banks
   - It does <u>not</u> for small affiliates of large, domestic-only banks

Interpretation

- Large and global banks insulated from FF

- The large - but non-global - banks are *not fully insulated*

  - *This contrasts with the seminal K&S result*

  - *A larger component of banking system is sensitive to monetary policy!*

- Takeaway: While large banks have external capital market access (as evidenced by differences compared with small banks), global banks have a combination of better external capital markets and or activate internal capital markets with foreign affiliates.

Understanding the effects of a 100 bp increase in the FFR				
Estimated % point change in TL growth	Median Bank TL growth** (in percent)	Total Loans in 2005q4**	Potential Loan growth in 2005q4 at median rate	Impact on potential loan growth in 2005q4 (1)X(3)
Large, domestic banks 0.13	1.9	$950 bln	$18 bln	-$1.24 bln
Foreign affiliates of large global banks 2.23	- 0.3	$335 bln	- $1.05 bln	- $8.04 bln
Small affiliates of large domestic banks 0.28	1.5	$20 bln	$300 mil	-$84 mil
Large global banks imputed insulation from affiliates 0.13*	1.76	$2.5 trn	$44 bln	- $3.25 bln

% point change in TL growth is the reduction in total lending, expressed in percentage point, from the increase in the Federal Funds rate. Median TL % growth is the median value over the sample period of total lending growth. Total lending in 2005q4 is the aggregate dollar amount of total lending for each bank group. Potential growth in 2005q4 at median rate is the increase in aggregate total lending in 2005q4 at the median growth rate over the sample period. Impact on potential growth measures the reduction in potential growth determined by the increase in the Federal Funds rate. ** Median TL growth and Total lending in 2005q4 of only the lower 90 percentile in liquidity asset ratio. *The % point change in TL growth for large, global banks is that for large, domestic banks, assuming the first group of banks to experience the same effect on lending as the second group, and using the log (liquidity asset) ratio.

Need to show it is not just global bank size, but actually is access to affiliate funds

- Global banks (medians) are substantially bigger than other large banks (medians) in top 5 percent of the asset distribution

- Do the global banks have better external capital market access, or use internal capital markets?

- Using net-due to/from data, we show that

  - internal capital markets are activated

  - magnitude of related flows same order of magnitude as imputed difference with domestic-only banks

Implications

- Evidence of a significant channel of **_international_** transmission of domestic monetary policy.

- While globalization may imply a reduction of effects of FF rates on the domestic market, the **total size** of the lending channel may be expanding once we count in the international component of effectiveness

  - This is an externality, not a part of the policy objective function of the Fed.

Summary of findings

- Large global banks are insulated from monetary policy; large, but non-global banks are *not* fully insulated through use of external capital markets

- Global banks achieve extra insulation by activating an internal capital market in response to domestic monetary policy shocks

- "Globalness" appears to be an important characteristic that allows insulation from liquidity shocks. Some insulation extends to small affiliates.

- Lending of foreign offices of global banks affected by U.S. monetary policy.

- Transmission of US policy at home and abroad influenced by banking globalization
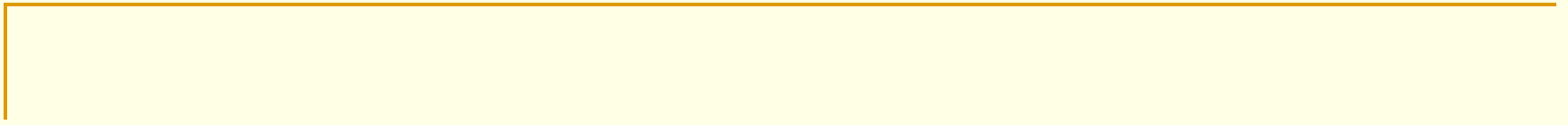
Three monetary policy variables: nominal Federal Funds rate, real FF, Bernanke-Mihov

Figure 3
Monetary Policy Variables
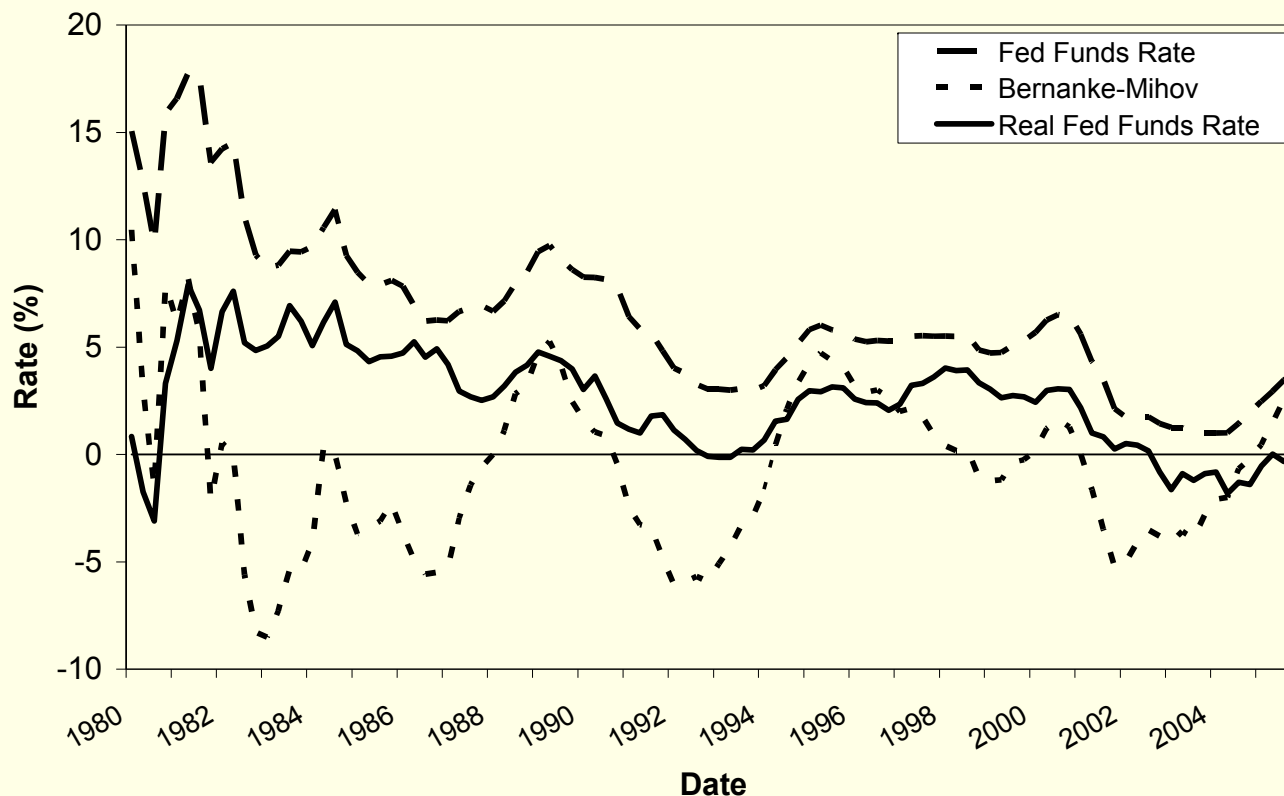
The Bernanke-Mihov measure is constructed via a "semi-structural VAR" model of the market for bank reserves. Oppositely signed compared to the published measure, so all empirical results enter these variables so that an increase in the monetary measure is interpreted as a tightening of liquidity conditions.

Similar pattern of domestic large bank versus global large bank lending channel results using C&I lending

	Total C&I Lending			
	Domestic Banks		Global Banks	
	no gdp controls	with gdp controls	no gdp controls	with gdp controls
FF (nominal)	**0.0012**	**0.0012**	-0.0009	-0.0012
FF (real)	0.0008	**0.0012**	-0.0002	0.0001
Bernanke-Mihov index	0.0000	-0.0001	-0.0004	-0.0007

$$(2) \quad \beta_t = \eta + \sum_{j=1}^{8} \phi_j MP_{t-j} + \delta \, Controls + \mu_t$$

Kashyap and Stein (2000)

Bank balance sheet

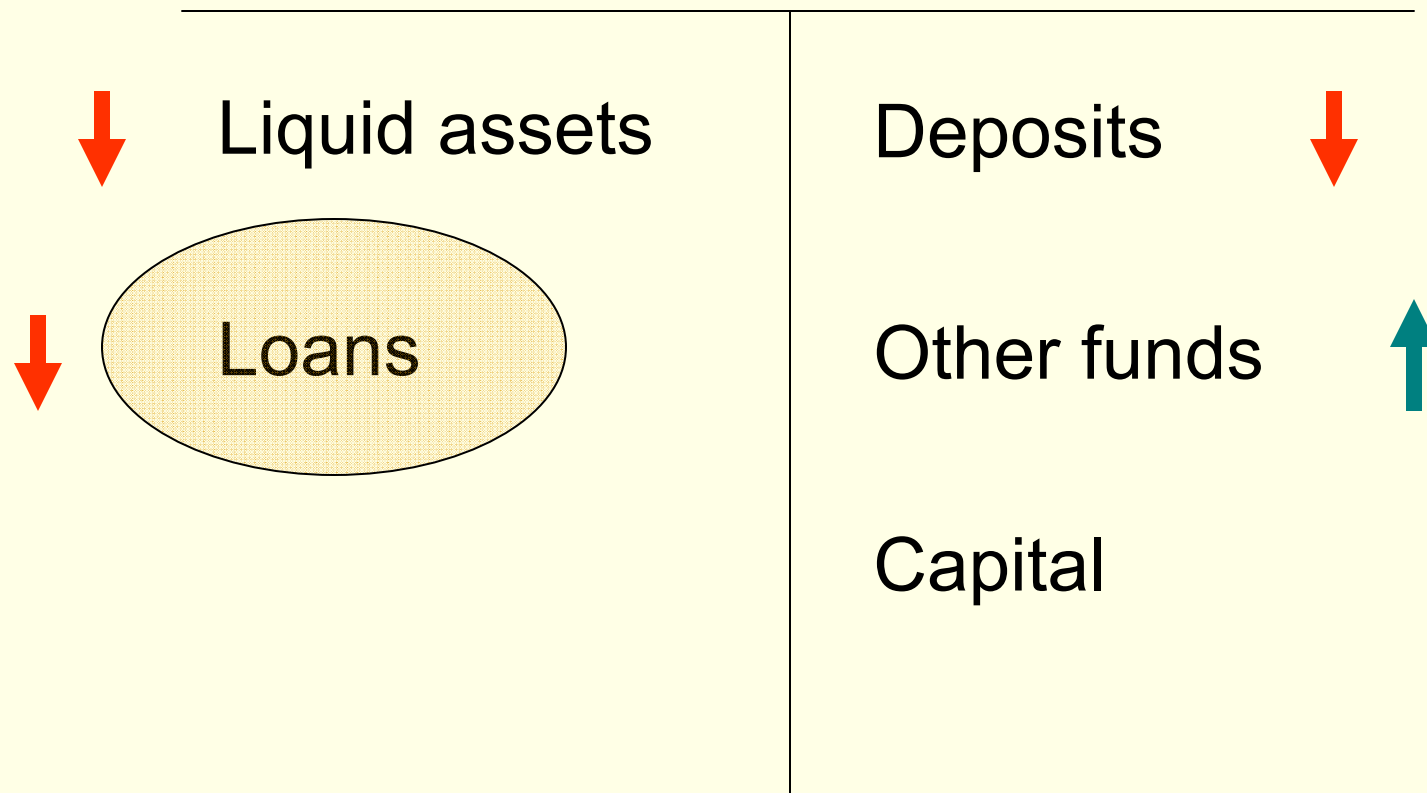| Liquid assets | Deposits |
| Loans | Other funds |
| | Capital |

Table 3 Results show significant changes in the balance sheet to lending (Total and C&I) relationship for Large Domestic Banks, but Globally-Oriented Banks unchanged

	Total Bank Lending			
	Domestic Banks		Global Banks	
	no gdp controls	with gdp controls	no gdp controls	with gdp controls
FF(nominal)	**0.0007**	**0.0008**	-0.0013	-0.0015
FF (real)	0.0006	**0.0012**	0.0003	-0.0004
Bernanke-Mihov index	**0.0003**	0.0003	0.0001	0.0003

$$(2) \quad \beta_t = \eta + \sum_{j=1}^{8} \phi_j MP_{t-j} + \delta \, \text{Controls} + \mu_t$$

Table 4 Monetary Policy and Net Due to Parent Banks from Foreign Affiliates is responsive to policy rate, symmetrically

Monetary variable	Real net inflows to parent (net due to less net due from)		
	baseline	Asymmetry Coefficients when	
		Tighter money	Looser money
Federal Funds Rate (nominal)	**189.1**	**383.9**	**206.5**
Fed Funds Rate (real)	**229.9**	**262.9**	**325.6**
Bernanke-Mihov index	**63.21**	**118.7**	56.4

(3) $\Delta Net\ Due_{i,t} = \alpha + \sum_{j=1}^{4} \varphi_j \Delta Net\ Due_{i,t-j} + \sum_{j=0}^{4} \phi_j \Delta MP_{t-j} + \sum_{j=0}^{4} \gamma_j \Delta GDP_{t-j} + \mu_t$

Table 5 Sensitivity of Foreign Lending to parent balance sheet reduced when U.S. liquidity conditions tighten – US banks receive more funds, or send less abroad during these times.

Monetary variable	Total Foreign C&I Lending		Total Foreign Lending	
	Without gdp controls	With gdp controls	Without gdp controls	With gdp controls
Federal Funds Rate (nominal)	**-0.019**	**-0.018**	**-0.012**	**-0.012**
Fed Funds Rate (real)	**-0.015**	**-0.014**	**-0.012**	**-0.137**
Bernanke-Mihov index	**-0.006**	-0.004	-0.003	-0.003

$$(2) \quad \beta_t = \eta + \sum_{j=1}^{8} \phi_j MP_{t-j} + \delta \, Controls + \mu_t$$

Table 6 Results for Small Affiliated with Domestic or Globally-Oriented Banks

	Total Bank Lending			
	Small in Domestic Banks		**Small in Global Banks**	
	no gdp controls	with gdp controls	no gdp controls	with gdp controls
Federal Funds Rate (nominal)	**0.291**	**0.520**	-0.139	-0.021
Fed Funds Rate (real)	**0.844**	**0.941**	-1.085	-1.058
Bernanke-Mihov index	0.128	**0.250**	-0.108	-0.014

Table 6 Results for Small Affiliated with Domestic or Globally-Oriented Banks

	Total C&I Lending			
	Small in Domestic Banks		**Small in Global Banks**	
	no gdp controls	with gdp controls	no gdp controls	with gdp controls
FF Rate (nominal)	**1.434**	**1.075**	-1.198	-0.340
Fed Funds Rate (real)	**2.502**	**2.647**	**-1.580**	-1.870
Bernanke-Mihov index	**0.771**	**0.662**	**-0.697**	**-0.494**