**Fig. 5.** Commercial and industrial bank credit (billion USD). The graph is compiled from the Federal Reserve Statistical Release of Assets and Liabilities of Commercial Banks in the United States. The numbers correspond to all commercial banks in United States, not seasonally adjusted.
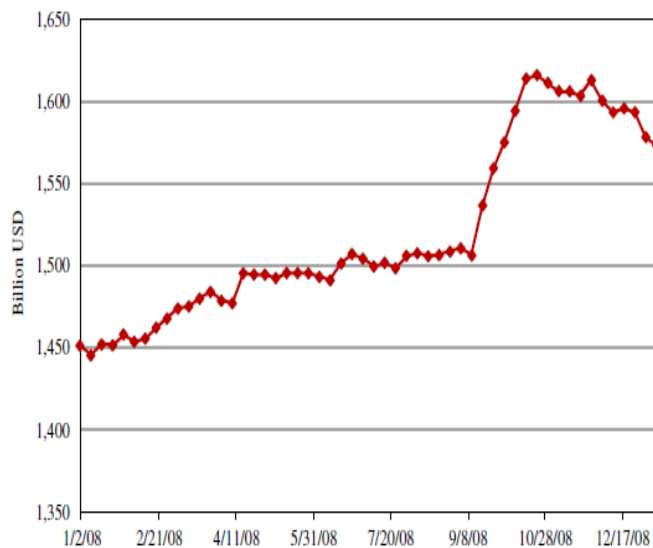


**Table 4**
Change in lending and deposits.

Deposits and assets correspond to the Call Reports figures as of the end of 2007. Pre-crisis, Crisis I, and Crisis II are respectively defined as periods August 2006 through July 2007, August 2007 through July 2008, and August 2008 through November 2008. The dependent variable is in percentage changes; e.g., %Δ Total number of loans (Aug'08–Nov'08 vs. Aug'07–Jul'08)=[Mean (Monthly number of loans issued between Aug'08 and Nov'08)/Mean (Monthly number of loans issued between Aug'07 and Jul'08) − 1]. (Lead bank) indicates variables calculated using only loans where the bank is the lead arranger; based on pro-rata credit and estimated retained share of the loans. All the other variables just count the total number of loans with the bank participation. Real investment loans are defined as those that are intended for general corporate purposes, capital expenditure, or working capital. Robust standard errors are reported in brackets. ***, **, * indicate statistical significance at 1%, 5%, and 10%, respectively.

| | (1) %Δ Total number of loans Crisis II vs. Crisis I | (2) %Δ Total number of loans Crisis II vs. Pre-crisis | (3) %Δ Total number of loans (lead bank) Crisis II vs. Crisis I | (4) %Δ Total number of loans (lead bank) Crisis II vs. Pre-crisis | (5) %Δ Total amount of loans (lead bank) Crisis II vs. Crisis I | (6) %Δ Total amount of loans (lead bank) Crisis II vs. Pre-crisis |
|---|---|---|---|---|---|---|
| *Panel A: All loans* | | | | | | |
| Deposits/ Assets | 0.22* | 0.42*** | 0.56** | 0.91*** | 0.27 | 0.81** |
| | [0.11] | [0.11] | [0.22] | [0.26] | [0.21] | [0.30] |
| Constant | −0.57*** | −0.79*** | −0.60*** | −0.83*** | −0.62*** | −0.86*** |
| | [0.06] | [0.04] | [0.10] | [0.08] | [0.12] | [0.08] |
| Observations | 38 | 38 | 38 | 38 | 38 | 38 |
| R-squared | 0.11 | 0.24 | 0.18 | 0.22 | 0.05 | 0.14 |
| *Panel B: Real investment loans* | | | | | | |
| Deposits/ Assets | 0.32* | 0.50*** | 0.79* | 1.44*** | 0.17 | 0.98*** |
| | [0.19] | [0.16] | [0.41] | [0.41] | [0.28] | [0.32] |
| Constant | −0.51*** | −0.72*** | −0.49** | −0.81*** | −0.52*** | −0.75*** |
| | [0.10] | [0.07] | [0.20] | [0.13] | [0.15] | [0.14] |
| Observations | 38 | 38 | 38 | 38 | 38 | 38 |
| R-squared | 0.11 | 0.21 | 0.10 | 0.14 | 0.01 | 0.06 |
| *Panel C: Deposits measured as of the year-end 2006.* | | | | | | |
| Deposits/ Assets | 0.23* | 0.43*** | 0.54** | 0.89*** | 0.31 | 0.87*** |
| | [0.12] | [0.11] | [0.21] | [0.24] | [0.21] | [0.31] |
| Constant | −0.58*** | −0.80*** | −0.60*** | −0.83*** | −0.65*** | −0.91*** |
| | [0.06] | [0.04] | [0.11] | [0.08] | [0.12] | [0.09] |
| Observations | 38 | 38 | 38 | 38 | 38 | 38 |
| R-squared | 0.13 | 0.26 | 0.17 | 0.21 | 0.07 | 0.17 |

**Table 6**

Change in lending and revolvers overhang.

Deposits and assets correspond to the Call Reports figures as of the end of 2007. %Revolving lines with Lehman is percentage of all credit lines originated before the end of 2007 that had Lehman Brothers as part of the lending syndicate. We only count those loans where Lehman was one of the key lenders. Pre-crisis, Crisis I, and Crisis II are respectively defined as periods August 2006 through July 2007, August 2007 through July 2008, and August 2008 through November 2008. The dependent variable is in percentage changes; e.g., %Δ Total number of loans (Aug'08–Nov'08 vs. Aug'07–Jul'08)=[Mean (Monthly number of loans issued between Aug'08 and Nov'08)/Mean (Monthly number of loans issued between Aug'07 and Jul'08) − 1]. (Lead bank) indicates variables calculated using only loans where the bank is the lead arranger; based on pro-rata credit and estimated retained share of the loans. All the other variables just count the total number of loans with the bank participation. Real investment loans are defined as those that are intended for general corporate purposes, capital expenditure, or working capital. Robust standard errors are reported in brackets. ***, **, * indicate statistical significance at 1%, 5%, and 10%, respectively.

| | (1) %Δ Total number of loans Crisis II vs. Crisis I | (2) %Δ Total number of loans Crisis II vs. Pre-crisis | (3) %Δ Total number of loans (lead bank) Crisis II vs. Crisis I | (4) %Δ Total number of loans (lead bank) Crisis II vs. Pre-crisis | (5) %Δ Total amount of loans (lead bank) Crisis II vs. Crisis I | (6) %Δ Total amount of loans (lead bank) Crisis II vs. Pre-crisis |
|---|---|---|---|---|---|---|
| **Panel A: All loans** | | | | | | |
| Deposits/Assets | 0.01 | 0.28** | 0.42* | 0.77*** | −0.08 | 0.74* |
| | [0.10] | [0.11] | [0.24] | [0.28] | [0.23] | [0.41] |
| % Revolving lines with Lehman | −1.31** | −0.93*** | −1.58** | −1.28** | −2.21*** | −0.38 |
| | [0.50] | [0.30] | [0.60] | [0.53] | [0.67] | [1.11] |
| Constant | −0.39*** | −0.66*** | −0.44*** | −0.69*** | −0.32** | −0.81*** |
| | [0.06] | [0.05] | [0.13] | [0.11] | [0.16] | [0.19] |
| Observations | 37 | 37 | 37 | 37 | 37 | 37 |
| R-squared | 0.26 | 0.26 | 0.27 | 0.23 | 0.17 | 0.13 |
| **Panel B: Real investment loans** | | | | | | |
| Deposits/Assets | 0.01 | 0.29 | 0.49 | 1.30** | −0.06 | 0.86** |
| | [0.18] | [0.19] | [0.46] | [0.48] | [0.33] | [0.38] |
| % Revolving lines with Lehman | −1.61** | −1.17** | −1.44 | −0.73 | −0.99 | −0.46 |
| | [0.66] | [0.50] | [1.25] | [1.09] | [1.28] | [1.08] |
| Constant | −0.25** | −0.54*** | −0.25 | −0.68*** | −0.34* | −0.66*** |
| | [0.11] | [0.10] | [0.25] | [0.20] | [0.20] | [0.19] |
| Observations | 37 | 37 | 37 | 37 | 37 | 37 |
| R-squared | 0.21 | 0.22 | 0.09 | 0.12 | 0.02 | 0.05 |
| **Panel C: All loans, term loans originated with Lehman** | | | | | | |
| Deposits/Assets | 0.16 | 0.38*** | 0.60** | 0.89*** | 0.20 | 0.86** |
| | [0.12] | [0.11] | [0.23] | [0.22] | [0.24] | [0.40] |
| % Term loans with Lehman | −0.28 | −0.29 | −0.29 | −0.58 | −0.25 | 0.81 |
| | [0.23] | [0.37] | [0.47] | [0.67] | [0.66] | [1.59] |
| Constant | −0.50*** | −0.73*** | −0.59*** | −0.75*** | −0.55*** | −1.00*** |
| | [0.07] | [0.07] | [0.14] | [0.11] | [0.17] | [0.32] |
| Observations | 37 | 37 | 37 | 37 | 37 | 37 |
| R-squared | 0.10 | 0.23 | 0.21 | 0.23 | 0.04 | 0.15 |

## TABLE I
### BANKING RELATIONSHIP REGRESSIONS

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Lender chosen as lead | | Lender chosen as participant | |
| **Explanatory variables** | | | | |
| Previous lead | 0.71** | 0.67** | 0.022** | -0.023** |
| | (0.011) | (0.012) | (0.0040) | (0.0045) |
| Previous participant | 0.029** | 0.020** | 0.50** | 0.46** |
| | (0.0014) | (0.0015) | (0.011) | (0.011) |
| Previous lead × Public (Unrated) | −0.052** | −0.043* | | |
| | (0.016) | (0.017) | | |
| Previous lead × Public (Rated) | −0.058** | −0.086** | | |
| | (0.014) | (0.016) | | |
| Previous participant × Public (Unrated) | | | 0.039* | 0.033+ |
| | | | (0.018) | (0.018) |
| Previous participant × Public (Rated) | | | 0.012 | −0.038* |
| | | | (0.014) | (0.015) |
| Lender FE | Yes | Yes | Yes | Yes |
| 2-digit SIC × lender FE | No | Yes | No | Yes |
| State × lender FE | No | Yes | No | Yes |
| Year × lender FE | No | Yes | No | Yes |
| Public/private × lender FE | No | Yes | No | Yes |
| All in drawn quartile × lender FE | No | Yes | No | Yes |
| Sales quartile × lender FE | No | Yes | No | Yes |
| $R^2$ | 0.480 | 0.504 | 0.285 | 0.334 |
| Borrower clusters | 3,253 | 3,253 | 3,253 | 3,253 |
| Observations | 349,008 | 349,008 | 349,008 | 349,008 |

*Notes.* The dependent variable is an indicator for whether the lender serves in the role indicated in the table header. For each loan in which the borrower has previous accessed the syndicated market, the data set contains one observation for each potential lender, where a potential lender is a lender active in the syndicated loan market in that year. The variables Previous lead and Previous participant equal 1 if the lender served as the lead or as a participant on the borrower's previous loan, respectively. The sample covers 2001 to June 2009 and excludes loans to borrowers in finance, insurance, or real estate, and for which the purpose of the loan is not working capital or general corporate purposes. Estimation is via OLS. Standard errors in parentheses and clustered by borrower. +, *, and ** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

## TABLE VI
### THE EFFECT OF BANK HEALTH ON THE LIKELIHOOD OF OBTAINING A LOAN

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Firm obtains a new loan or positive modification | | | | | |
| | Probit | | $\Delta \tilde{L}_{i,s}$ instrumented using | | | |
| | | | Lehman exposure | ABX exposure | Bank statement items | All |
| **Explanatory variables** | | | | | | |
| %$\Delta$ loans to other firms ($\Delta\tilde{L}_{i,s}$) | 2.19** | 2.00** | 3.65** | 2.33* | 2.28** | 2.32** |
| | (0.79) | (0.53) | (1.28) | (1.12) | (0.64) | (0.63) |
| 2-digit SIC, state, loan year FE | No | Yes | Yes | Yes | Yes | Yes |
| Bond access/public/private FE | No | Yes | Yes | Yes | Yes | Yes |
| Additional Dealscan controls | No | Yes | Yes | Yes | Yes | Yes |
| First stage $F$-statistic | | | 14.0 | 8.2 | 18.2 | 19.8 |
| $J$-statistic $p$-value | | | . | . | . | 0.206 |
| $E[borrow]$ | 0.134 | 0.134 | 0.134 | 0.134 | 0.134 | 0.134 |
| $E[\widehat{borrow}{:}\Delta\tilde{L}_{p_{90}} - \Delta\tilde{L}_{p_{10}}]$ | 0.052 | 0.048 | 0.087 | 0.055 | 0.054 | 0.055 |
| Lead lender 1 clusters | 43 | 43 | 43 | 40 | 43 | 40 |
| Lead lender 2 clusters | 43 | 43 | 43 | 40 | 43 | 40 |
| Observations | 4,391 | 4,391 | 4,391 | 4,354 | 4,391 | 4,354 |

*Notes.* The dependent variable is an indicator for whether the borrower signed a new loan or received a favorable modification to an existing loan between October 2008 and June 2009. The variable $\Delta\tilde{L}_{i,s}$ equals the change in the annualized number of loans made by the bank between the periods October 2005 to June 2007 and October 2008 to June 2009, and has been normalized to have unit variance. The variable Lehman cosyndication exposure equals the fraction of the bank's syndication portfolio where Lehman Brothers had a lead role in the loan deal. The variable ABX exposure equals the loading of the bank's stock return on the ABX AAA 2006-H1 index between October 2007 and December 2007. The balance sheet and income statement items include the ratio of deposits to assets at the end of 2007, the ratio of trading revenue over 2007–8 to assets, the ratio of net real estate charge-offs over 2007–8 to assets, and an indicator for reporting real estate charge-offs. The last column includes all of the instruments. For each firm, the bank-level measures are averaged over the members of the firm's last precrisis loan syndicate, with weights given according to each bank's role. In columns (1) and (2) estimation is via probit, and the table reports marginal coefficients. In columns (3)–(6) $\Delta\tilde{L}_{i,s}$ is instrumented using the variable indicated in the column heading and estimation is via two-stage least squares. Borrower-level covariates are as of the last precrisis loan taken by each borrower. Additional Dealscan controls: multiple lead lenders indicator, loan due during crisis indicator, credit line indicator, log sales at close, all in drawn spread, credit line * all in drawn. Standard errors in parentheses and two-way clustered on the lead lenders in the borrower's last precrisis loan syndicate. +, *, and ** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

## TABLE IX
### THE EFFECT OF LENDER CREDIT SUPPLY ON EMPLOYMENT

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | | | Employment growth rate 2008:3–2009:3 | | | |
| | OLS | | $\Delta\tilde{L}_{i,s}$ instrumented using | | | |
| | | | Lehman exposure | ABX exposure | Bank statement items | All |
| Explanatory variables | | | | | | |
| %Δ loans to other firms ($\Delta\tilde{L}_{i,s}$) | 1.17* | 1.67** | 2.49* | 3.17* | 2.13* | 2.38** |
| | (0.58) | (0.61) | (1.00) | (1.35) | (0.88) | (0.77) |
| Lagged employment growth | | 0.0033 | 0.0039 | 0.0045 | 0.0036 | 0.0039 |
| | | (0.019) | (0.019) | (0.019) | (0.019) | (0.019) |
| Emp. change in firm's county | | 0.89* | 0.85+ | 0.86+ | 0.87+ | 0.89+ |
| | | (0.43) | (0.46) | (0.48) | (0.45) | (0.46) |
| 2-digit SIC, state, loan year FE | No | Yes | Yes | Yes | Yes | Yes |
| Firm size bin FE | No | Yes | Yes | Yes | Yes | Yes |
| Firm age bin FE | No | Yes | Yes | Yes | Yes | Yes |
| Bond access/public/private FE | No | Yes | Yes | Yes | Yes | Yes |
| Additional Dealscan controls | No | Yes | Yes | Yes | Yes | Yes |
| First-stage $F$-statistic | | | 15.5 | 8.5 | 18.5 | 23.1 |
| $J$-statistic $p$-value | | | . | . | . | 0.190 |
| $E[g_j^y]$ | −0.092 | −0.092 | −0.092 | −0.093 | −0.092 | −0.093 |
| $E[g_j^y : \Delta\tilde{L}_{p90} − \Delta\tilde{L}_{p10}]$ | 0.027 | 0.039 | 0.058 | 0.074 | 0.050 | 0.055 |
| Lead lender 1 clusters | 43 | 43 | 43 | 40 | 43 | 40 |
| Lead lender 2 clusters | 43 | 43 | 43 | 40 | 43 | 40 |
| Observations | 2,040 | 2,040 | 2,040 | 2,015 | 2,040 | 2,015 |

*Notes.* The dependent variable is the symmetric growth rate $g_j^y$ of employment. The variable $\Delta\tilde{L}_{i,s}$ equals the change in the annualized number of loans made by the bank between the periods October 2005 to June 2007 and October 2008 to June 2009 and has been normalized to have unit variance. The variable Lehman co-syndication exposure equals the fraction of the bank's syndication portfolio where Lehman Brothers had a lead role in the loan deal. The variable ABX exposure equals the loading of the bank's stock return on the ABX AAA 2006-H1 index between October 2007 and December 2007. The balance sheet and income statement items include the ratio of deposits to assets at the end of 2007, the ratio of trading revenue over 2007–8 to assets, the ratio of net real estate charge-offs over 2007–8 to assets, and an indicator for report real estate charge-offs. For each firm, the bank-level measures are averaged over the members of the firm's last precrisis loan syndicate, with weights given according to each bank's role. In columns (1) and (2) estimation is via OLS. In columns (3)–(6) $\Delta\tilde{L}_{i,s}$ is instrumented using the variable indicated in the column heading. Borrower-level covariates are as of the last precrisis loan taken by each borrower. Firms divided into size bin classes of 1–250, 250–999, and 1,000+, and age bins for birth in the 2000s, 1990s, or earlier. Additional Dealscan controls: multiple lead lenders indicator, loan due during crisis indicator, credit line indicator, log sales at close, all in drawn spread, credit line * all in drawn. Standard errors in parentheses and two-way clustered on the lead lenders in the borrower's last precrisis loan syndicate. +, *, and ** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

## TABLE X
### THE EFFECT OF LENDER CREDIT SUPPLY ON EMPLOYMENT WITH HETEROGENEOUS TREATMENT EFFECTS

| | (1) | (2) | (3) |
|---|---|---|---|
| | Employment growth rate 2008:3–2009:3 | | |
| Explanatory variables | | | |
| $\Delta\tilde{L}_{i,s}$ * Large | 0.54 | | |
| | (0.97) | | |
| $\Delta\tilde{L}_{i,s}$ * Medium | 1.84+ | | |
| | (0.97) | | |
| $\Delta\tilde{L}_{i,s}$ * Small | 2.16** | | |
| | (0.79) | | |
| $\Delta\tilde{L}_{i,s}$ * Bond market access | | 1.04 | |
| | | (1.00) | |
| $\Delta\tilde{L}_{i,s}$ * No access | | 2.01** | |
| | | (0.60) | |
| $\Delta\tilde{L}_{i,s}$ * Bond access & large | | | 0.23 |
| | | | (1.15) |
| $\Delta\tilde{L}_{i,s}$ * Bond access & small/medium | | | 1.47 |
| | | | (1.06) |
| $\Delta\tilde{L}_{i,s}$ * No access & large | | | 0.79 |
| | | | (1.21) |
| $\Delta\tilde{L}_{i,s}$ * No access & small/medium | | | 2.26** |
| | | | (0.58) |
| Lagged employment growth | Yes | Yes | Yes |
| Emp. change in firm's county | Yes | Yes | Yes |
| 2-digit SIC, state, loan year FE | Yes | Yes | Yes |
| Firm size and age bin FE | Yes | Yes | Yes |
| Bond access/public/private FE | Yes | Yes | Yes |
| Additional Dealscan controls | Yes | Yes | Yes |
| Observations (Access & large) | 483 | 483 | 483 |
| Observations (Access & small/medium) | 434 | 434 | 434 |
| Observations (No access & large) | 315 | 315 | 315 |
| Observations (No access & small/medium) | 808 | 808 | 808 |
| Observations | 2,040 | 2,040 | 2,040 |

*Notes.* The dependent variable is the symmetric growth rate $g_j^y$ of employment. The variable $\Delta\tilde{L}_{i,s}$ equals the change in the annualized number of loans made by the bank between the periods October 2005 to June 2007 and October 2008 to June 2009, and has been normalized to have unit variance. Firms divided into size bin classes of 1–250, 250–999, and 1,000+, and age bins for birth in the 2000s, 1990s, or earlier. Bond market access is equal to 1 if the firm has any bonds listed in the Mergent FISD database or if the firm has a credit rating. Additional Dealscan controls: multiple lead lenders indicator, loan due during crisis indicator, credit line indicator, log sales at close, all in drawn spread, credit line * all in drawn. Standard errors in parentheses and two-way clustered on the lead lenders in the borrower's last precrisis loan syndicate. +, *, and ** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

# Figure 1
## Housing Net Worth Shock and Non-tradable Employment

This figure presents scatter-plots of county level non-tradable employment growth from 2007Q1 to 2009Q1 against the change in housing net worth from 2006 to 2009. The left panel defines industries in restaurant and retail sector as non-tradable, and the right panel defines industries as non-tradable if they are geographically dispersed throughout the United States. The sample includes counties with more than 50,000 households. The thin black line in the left panel is the non-parametric plot of non-tradable employment growth against change in housing net worth.
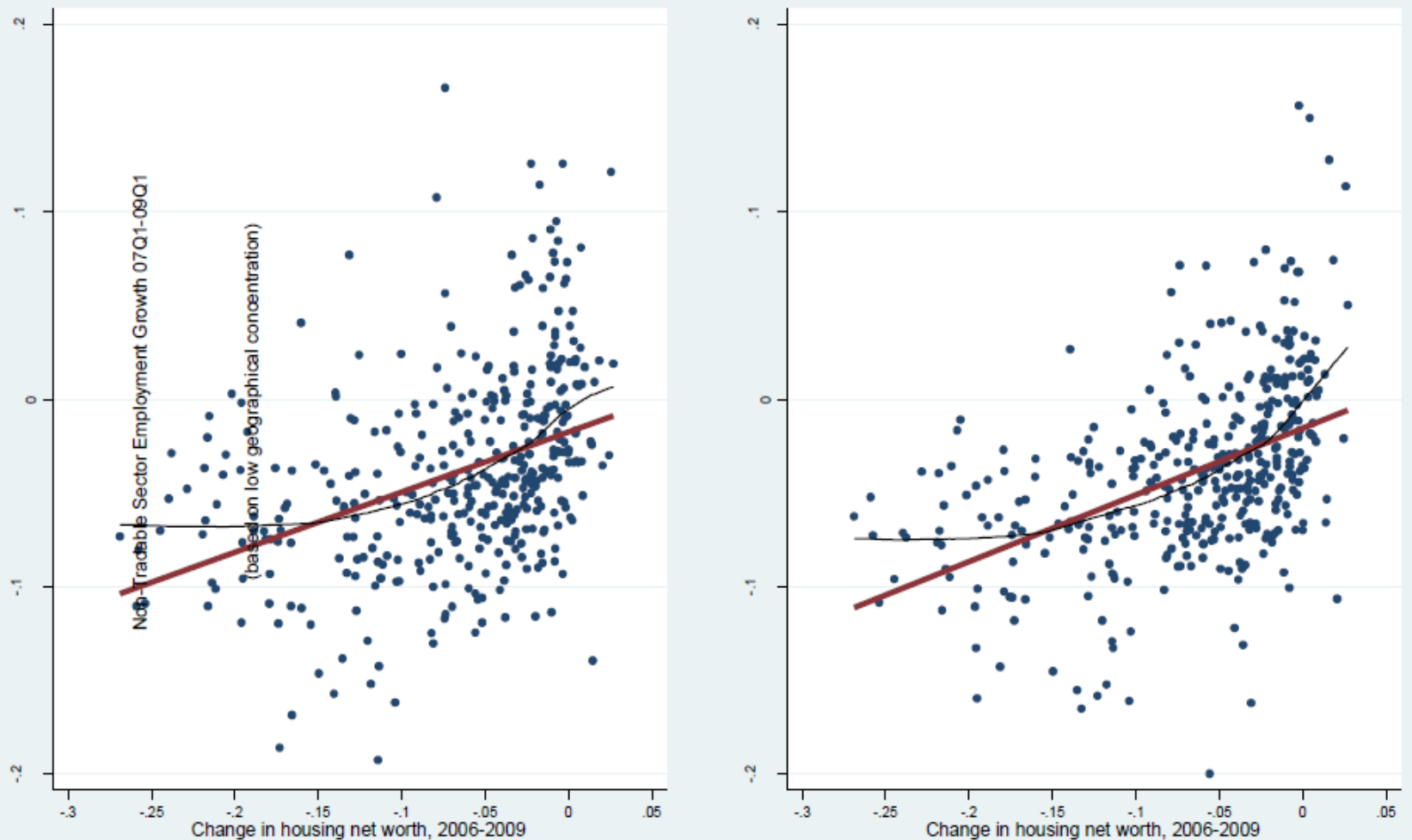
## Table 4
### Non-Tradable Employment Growth And The Housing Net Worth Shock

This table presents coefficients from regressions relating non-tradable employment growth in a county from 2007 to 2009 to the change in housing net worth between 2006 and 2009. Non-tradable employment is defined at the 4-digit industry level and then aggregated up separately for each county. We use two different definitions of non-tradable industries, one based on restaurant and retail sector, and another based on an industry's geographical concentration. All regressions are weighted using the total number of households in a county as weights. The instrumental variables specifications use the housing supply elasticity as an instrument for the change in housing net worth in the first stage. Standard errors are adjusted for spatial correlation across counties, with the correlation proportional to the inverse of the distance between any two counties.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | | | Employment growth, non-tradable industries, 2007-2009 | | | | | |
| Non-tradable definition used: | Restaurant & Retail | Geographical Concentration | Restaurant & Retail | Geographical Concentration | Restaurant & Retail | Geographical Concentration | Restaurant & Retail | Geographical Concentration |
| Change in Housing Net Worth, 2006-2009 | 0.190** | 0.199** | 0.305** | 0.227* | 0.174** | 0.166** | 0.374** | 0.208* |
| | (0.042) | (0.049) | (0.101) | (0.106) | (0.043) | (0.046) | (0.132) | (0.086) |
| Constant | -0.022** | -0.021** | -0.010 | -0.017 | 0.176 | 0.070 | 0.445 | 1.233** |
| | (0.007) | (0.007) | (0.010) | (0.010) | (0.443) | (0.286) | (0.536) | (0.438) |
| Specification | OLS | OLS | IV | IV | OLS | OLS | IV | IV |
| 2-digit 2006 employment share controls included?# | | | | | YES | YES | YES | YES |
| N | 944 | 944 | 540 | 540 | 944 | 944 | 540 | 540 |
| $R^2$ | 0.096 | 0.156 | 0.057 | 0.166 | 0.175 | 0.236 | 0.158 | 0.275 |

**,* Coefficient statistically different than zero at the 1% and 5% confidence level, respectively.
# The 23 two-digit industries are: Agriculture, Mining, Utilities, Construction, Manufacturing (3 2-digit industries),Wholesale Trade, Retail trade (2 2-digit industries), Transportation (2 2-digit industries), Information, Finance, Real Estate, Professional Services, Management, Administrative Services, Education, Health Care, Entertainment, Accommodation and Food Services, Other Services.

## Table 6
## Is Non-Tradable Employment Growth Driven By Credit Supply Tightening?

This table presents coefficients from regressions relating non-tradable employment growth in a county from 2007 to 2009 to the change in housing net worth between 2006 and 2009. Panels A and B reports the OLS and IV coefficient estimates respectively for establishments of varying sizes. Panel C reports the coefficients separately for national and local banking markets. Non-tradable employment is defined as employment in restaurant and retail industries at the 4-digit industry level and then aggregated up separately for each county. All regressions are weighted using the total number of households in a county as weights. The instrumental variables specifications use the housing supply elasticity as an instrument for the change in housing net worth in the first stage. Standard errors are adjusted for spatial correlation across counties, with the correlation proportional to the inverse of the distance between any two counties.

Panel C: Effect of Change in Housing Net Worth on Non-tradable Employment Growth By Banking Type

| | National (OLS, N=472) | Local (OLS, N=304) | National (IV, N=472) | Local (IV, N=236) |
|---|---|---|---|---|
| Change in Housing Net Worth, 2006-2009 | 0.186** (0.041) | 0.306 (0.178) | 0.233** (0.068) | 0.308** (0.107) |

**,* Coefficient statistically different than zero at the 1% and 5% confidence level, respectively