

# Does Uniqueness in Banking Matter?

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Chicago Financial Institutions Conference

April 6, 2018

# Motivation (I)

- Banking comprises many different activities that can be categorized in various ways
- We focus on the **uniqueness of banking activities**
  - Some activities are common and performed by all banks (e.g., demand deposits), others are unique and performed by few banks (e.g., credit derivatives)
  - Recently, gained attention by regulators as “lack of substitutability” is one of the criteria for systemically important banks
- We investigate whether and how the uniqueness of banking activities affects banks’ **performance** and their sensitivity to **systematic risk**

## Motivation (II)

- Performance
  - Uniqueness of activities might originate from innovation, expertise or related strategies
  - Likely to **increase profits** and/or **reduce risk**
- Systemic risk
  - Uniqueness might **increase** systemic risk: Regulators consider the lack of substitutability as a criterion for systemically important banks
  - Uniqueness might **decrease** systemic: Uniqueness may create diversity in the system that reduces negative external effects (from fire sales) in systemic crises

## Related literature and contribution

- Diversification and specialization
  - Revenues (Demsetz and Strahan 1997; Stiroh 2004 & 2006; Acharya et al. 2006), funding (Demirgüç-Kunt and Huizinga 2010), diversification discount (Laeven and Levine 2007; Schmidt and Walter 2009), syndicate lending (Cai et al. 2018) → most of the studies find lower risk-adjusted returns and lower market values
  - Related to banks' number of activities, but not to **activity uniqueness**
- Financial innovation and expertise
  - Innovation (Thakor 2012) and expertise (Boot and Thakor 2000) give rise to **unique activities that increase bank performance**
- Systemic risk and financial stability
  - Measures of systemic risk (Acharya et al. 2016; Adrian and Brunnermeier 2016), effects of TARP (Berger, Roman and Sedunov, 2016)
  - **“Too-important-to fail” subsidy** for systemically important banks
  - **“Diversity-diversification trade-off”** (Wagner, 2011)

# Preview of results

- Performance
  - Banks that carry out more unique activities exhibit **higher profitability** and **lower risk**
  - Main channel is product differentiation, not productivity
- Systemic risk
  - Banks' sensitivity to systemic risk displays an **inversely U-shaped relation** with activity uniqueness
    - Robust for  $\Delta CoVaR$  and *MES*
    - 65% of obs. positive relation, 35% of obs. negative relation
  - Activity uniqueness in pre-crisis times has a positive impact on bank performance during the 2007-09 financial crisis
  - Activity uniqueness inversely U-shaped relation with banks' bailout probability during the financial crisis (TARP)

## Measurement of activity uniqueness

- Step 1: We define a banking activity as any of the items of the FR\_Y-9C Consolidated Financial Statements of Bank Holding Companies (BHCs). We exclude activities performed by all banks (e.g., equity).
- Step 2: Uniqueness of an activity in the financial system (activity-level)

$$\textit{Uniqueness score}_{a,t} = 1 - \frac{\sum_{i=1}^{N_t} I_{i,a,t}}{N_t}$$

- Step 3: Weighted average of activity uniqueness of bank I (bank-level)

$$\textit{Activity uniqueness}_{i,t} = \sum_{a=1}^{N_i} \textit{Uniqueness score}_{a,t} \frac{\textit{Volume}_{i,a,t}}{\textit{Total assets}_{i,t}}$$

The volume weights are capped at 1 and we normalize the measure by its maximum in the sample so that it takes values from 0 to 1.

# Data

- U.S. BHC data from 1986-2013
- Information on banks with Section 20 subsidiaries prior to the Gramm-Leach-Bliley Act of 1999
- Final sample
  - 3,050 BHCs
  - 29,673 bank-year observations
- Activity uniqueness
  - Mean=0.63, Std. Dev.=0.06
  - Correlation with bank size (0.30), income diversification (0.25), geographic diversification (0.17)

## Baseline analysis

| Dep. Var.:   | ROA                   |                       | Log Z-score           |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
|  | (1)                   | (5)                   | (6)                   | (10)                  |
| <i>Activity uniqueness<sub>t-1</sub></i>                         | 0.395***<br>(2.875)   | 0.452***<br>(2.672)   | 0.536**<br>(2.441)    | 0.160***<br>(3.233)   |
| <i>Log Total assets<sub>t-1</sub></i>                            | -0.040***<br>(-7.970) | -0.218***<br>(-9.338) | -0.071***<br>(-6.740) | -0.025***<br>(-3.354) |
| <i>Equity/Total assets%<sub>t-1</sub></i>                        | 0.061***<br>(24.714)  | 0.033***<br>(8.154)   | 0.120***<br>(26.083)  | 0.080***<br>(58.684)  |
| <i>Liquid assets/Total assets%<sub>t-1</sub></i>                 | 0.003***<br>(4.278)   | 0.002**<br>(2.421)    | 0.007***<br>(6.012)   | 0.000*<br>(1.854)     |
| <i>Non-interest income/Total operating income%<sub>t-1</sub></i> | 0.024***<br>(22.575)  | 0.015***<br>(9.281)   | 0.003*<br>(1.924)     | 0.004***<br>(7.770)   |
| <i>Constant</i>  | 1.419***<br>(12.296)  | 4.040***<br>(10.890)  | 3.257***<br>(18.859)  | 2.938***<br>(25.079)  |
| <i>Diversification controls</i>                                  | No                    | Yes                   | No                    | Yes                   |
| <i>Time fixed effects</i>  | Yes                   | Yes                   | Yes                   | Yes                   |
| <i>Bank fixed effects</i>  | No                    | Yes                   | No                    | Yes                   |
| Number of observations   | 33767                 | 33767                 | 33673                 | 33673                 |
| R <sup>2</sup>   | 0.324                 | 0.262                 | 0.245                 | 0.450                 |



# Instrumental variable regression

- The variables *Activity uniqueness* and performance (*ROA, Z-Score*) might be **endogenous**
- Instrumental variable analysis
  - Consider peer characteristics
  - Frequently used as instruments for individual characteristics that are potentially endogenous with the dependent variable (e.g., Demirgüç-Kunt and Detragiache 2002; Laeven and Levine 2009; Lin et al. 2011; Suarez et al. 2013; Liu et al. 2014; Khanna et al. 2015; Ferrell et al. 2016)
  - Our instruments
    - Average *Activity uniqueness* of other banks headquartered in the same state
    - Size-weighted average *Activity uniqueness* of other banks headquartered in the same state
    - Same decile group of the yearly national bank size distribution (Ellul and Yerramilli, 2013)

# Instrumental variable regression

|   | Instrument:<br>Peer average activity uniqueness per state |                                     |                    | Instrument:<br>Peer average activity uniqueness in the<br>same size decile <sub>t-1</sub> |                                     |                    |
|---|---|-------------------------------------|--------------------|---|-------------------------------------|--------------------|
|   | <u>First stage</u><br>(1)                                 | <u>Second stage</u><br>(2)      (3) |                    | <u>First stage</u><br>(4)   | <u>Second stage</u><br>(5)      (6) |                    |
|   | <i>Activity uniqueness<sub>t-1</sub></i>                  | <i>ROA</i>                          | <i>Log Z-Score</i> | <i>Activity uniqueness<sub>t-1</sub></i>  | <i>ROA</i>                          | <i>Log Z-Score</i> |
| <i>Activity uniqueness<sub>t-1</sub></i>                              |   | 4.936***<br>(6.207)                 | 2.095*<br>(1.897)  |   | 0.362***<br>(2.758)                 | 2.095*<br>(1.897)  |
| <i>Peer average activity uniqueness per state<sub>t-1</sub></i>       | 0.626***<br>(47.551)                                      |                                     |                    |   |                                     |                    |
| <i>Peer activity uniqueness in the same size decile<sub>t-1</sub></i> |   |                                     |                    | 0.897***<br>(393.799)   |                                     |                    |
| <i>Time fixed effects</i>   | Yes   | Yes                                 | Yes                | Yes   | Yes                                 | Yes                |
| <i>Bank controls</i>  | Yes   | Yes                                 | Yes                | Yes   | Yes                                 | Yes                |
| <i>Bank fixed effects</i>   | Yes   | Yes                                 | Yes                | Yes   | Yes                                 | Yes                |
| Number of obs.  | 33718   | 33718                               | 33624              | 33767   | 33767                               | 33673              |
| R <sup>2</sup>  | 0.313   | 0.241                               | 0.238              | 0.427   | 0.324                               | 0.243              |
| First stage F test (p-value)  |   | 0                                   | 0                  |   | 0                                   | 0                  |

## Changes of activity uniqueness around the GLB (1999)

- Gramm-Leach-Bliley (GLB) Act of 1999 as **exogenous variation** in the uniqueness of banking activities
- We argue that banks that were already active in investment banking before the GLB (“Section 20 banks”) had the highest sensitivity to this regulatory change
- After the GLB the activity uniqueness of Section 20 banks might have increased because they could establish BHCs and perform more financial innovation and investment banking

## Changes of activity uniqueness around the GLB (1999)

|                           | Full sample                |                      |                       | Matched sample             |                      |                       |
|---------------------------|----------------------------|----------------------|-----------------------|----------------------------|----------------------|-----------------------|
|                           | (1)                        | (2)                  | (3)                   | (4)                        | (5)                  | (6)                   |
|                           | <i>Activity uniqueness</i> | <i>ROA</i>           | <i>Log Z-score</i>    | <i>Activity uniqueness</i> | <i>ROA</i>           | <i>Log Z-score</i>    |
| <i>Section20*PostGLB</i>  | 0.063***<br>(7.574)        | 0.219**<br>(2.514)   | 0.106***<br>(3.446)   | 0.051***<br>(4.729)        | 0.230*<br>(1.898)    | 0.109*<br>(1.898)     |
| <i>Constant</i>           | 0.632***<br>(446.546)      | 0.761***<br>(34.740) | 3.056***<br>(331.165) | 0.746***<br>(130.268)      | 0.899***<br>(19.115) | 2.761***<br>(136.930) |
| <i>Time fixed effects</i> | Yes                        | Yes                  | Yes                   | Yes                        | Yes                  | Yes                   |
| <i>Bank fixed effects</i> | Yes                        | Yes                  | Yes                   | Yes                        | Yes                  | Yes                   |
| Number of obs.            | 31893                      | 31893                | 31499                 | 655                        | 655                  | 655                   |
| R <sup>2</sup>            | 0.253                      | 0.067                | 0.176                 | 0.575                      | 0.280                | 0.444                 |

- Activity uniqueness of Section 20 banks increased after the GLB and these banks increased their performance as well
- The results are similar if we use *Large* (top 5% banks in terms of total assets) instead of *Section20* to identify the banks that are most sensitive to the GLB

# Activity uniqueness and systemic risk

|   | $\Delta CoVar$     |                      | $MES$            |                        |
|---|--------------------|----------------------|------------------|------------------------|
|   | (1)                | (2)                  | (3)              | (4)                    |
| <i>Activity uniqueness<sub>t-1</sub></i>        | -0.081<br>(-0.154) | 13.076**<br>(2.007)  | 0.171<br>(0.281) | 20.227***<br>(3.707)   |
| <i>Activity uniqueness square<sub>t-1</sub></i> |                    | -9.264**<br>(-1.966) |                  | -14.122***<br>(-3.804) |
| <i>Bank controls</i>                            | Yes                | Yes                  | Yes              | Yes                    |
| <i>Time fixed effects</i>                       | Yes                | Yes                  | Yes              | Yes                    |
| <i>Bank fixed effects</i>                       | Yes                | Yes                  | Yes              | Yes                    |
| Number of obs.                                  | 7028               | 7028                 | 7024             | 7024                   |
| R <sup>2</sup>                                  | 0.275              | 0.276                | 0.476            | 0.478                  |

- **Inversely U-shaped relation** controlling for size, diversification, other determinants of systemic risk, year fixed effects and bank fixed effects
- 65% of obs. positive relation, 35% of obs. negative relation

## Effects of pre-crisis activity uniqueness during the 2007-09 financial crisis

|   | (1)                 | (2)                 | (3)                  | (4)                 | (5)                |
|---|---------------------|---------------------|----------------------|---------------------|--------------------|
|   | <i>ROA</i>          | <i>Log Z-score</i>  | <i>TARP</i>          | <i>Target</i>       | <i>Failure</i>     |
| <i>Activity uniqueness<sub>2006</sub></i> | 2.061***<br>(4.189) | 2.365***<br>(4.418) | -1.971**<br>(-2.064) | -1.859*<br>(-1.786) | -1.641<br>(-1.411) |
| <i>Bank controls</i>                      | Yes                 | Yes                 | Yes                  | Yes                 | Yes                |
| Number of obs.                            | 859                 | 858                 | 859                  | 859                 | 859                |
| R <sup>2</sup>                            | 0.150               | 0.141               |                      |                     |                    |

Cross-sectional regressions (number of obs. = number of banks)

- Dependent variables: Average for ROA and log Z-score during 2007-2009; dummy variables for TARP, Target and Failure
- Explanatory variables: Values from 2006

# Conclusion

- Novel and robust evidence that the uniqueness of banking activities affects bank performance and systemic risk
  - Banks performing more unique activities exhibit **higher profitability** and **lower risk**
  - Banks' sensitivity to systemic risk **inversely U-shaped** in activity uniqueness
- Consistent with recent theoretical work showing that diversity in the banking system is critical for financial stability
- Banks, regulators and policy makers should consider these effects when making decisions that influence the uniqueness of banking activities at the micro and macro level