

Consumer Lending Efficiency: Commercial Banks versus a Fintech Lender

Joseph P. Hughes

Rutgers University

Julapa Jagtiani*

Federal Reserve Bank of Philadelphia

Choon-Geol Moon

Hanyang University

**Fintech and the New Financial Landscape
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*The views expressed here do not necessarily represent those of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

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- **Nonperforming unsecured consumer loan ratio**

$$= \frac{\text{past-due unsecured consumer loans} + \text{gross charged-off loans}}{\text{total unsecured consumer loans} + \text{gross charged-off loans}}$$

“Efficiency” Defined by Loan Performance

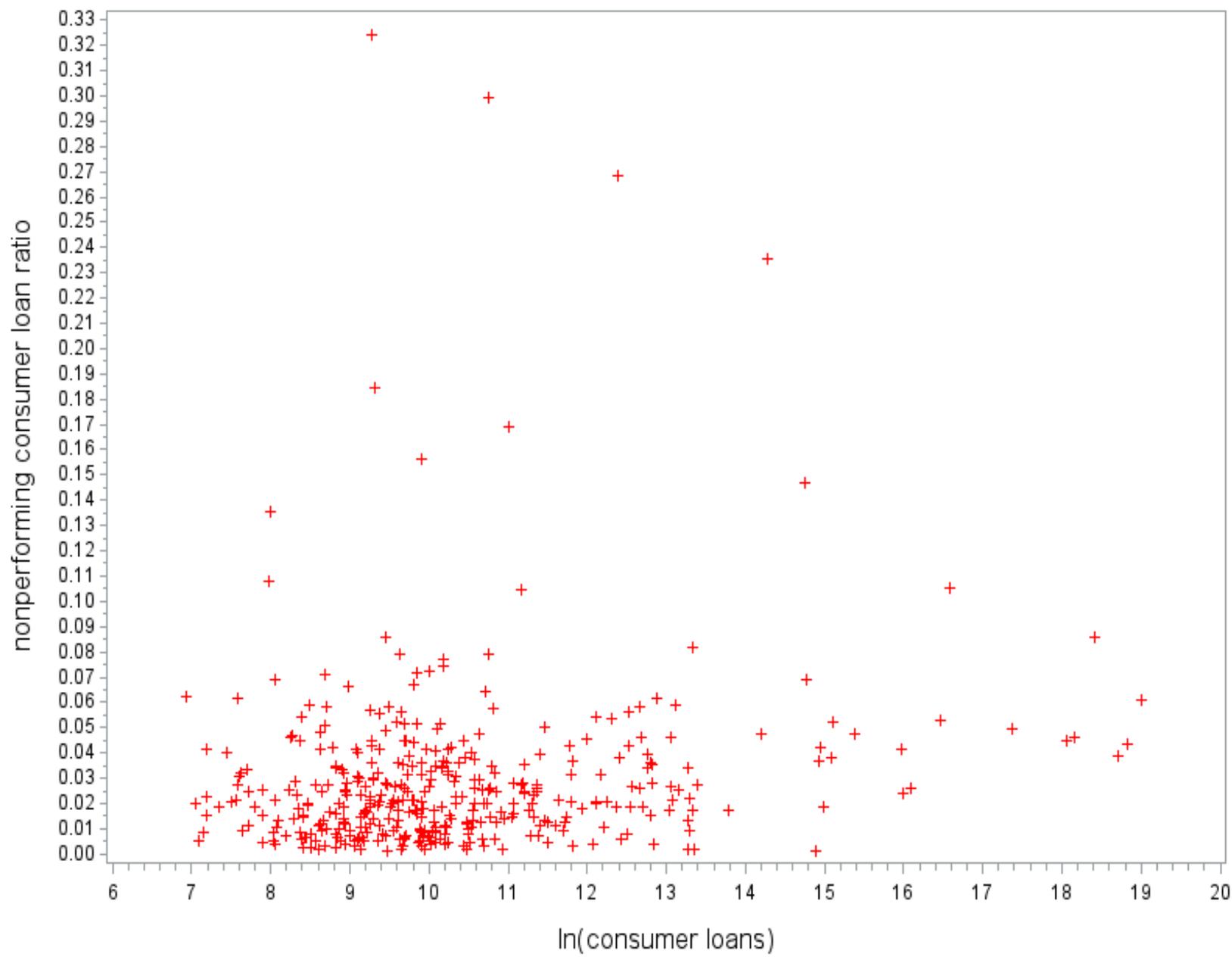
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 - the observed nonperforming consumer loan ratio
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 - scale of lending (lending technology)
 - economic conditions in a lender’s local markets
 - average contractual interest rate on consumer loans

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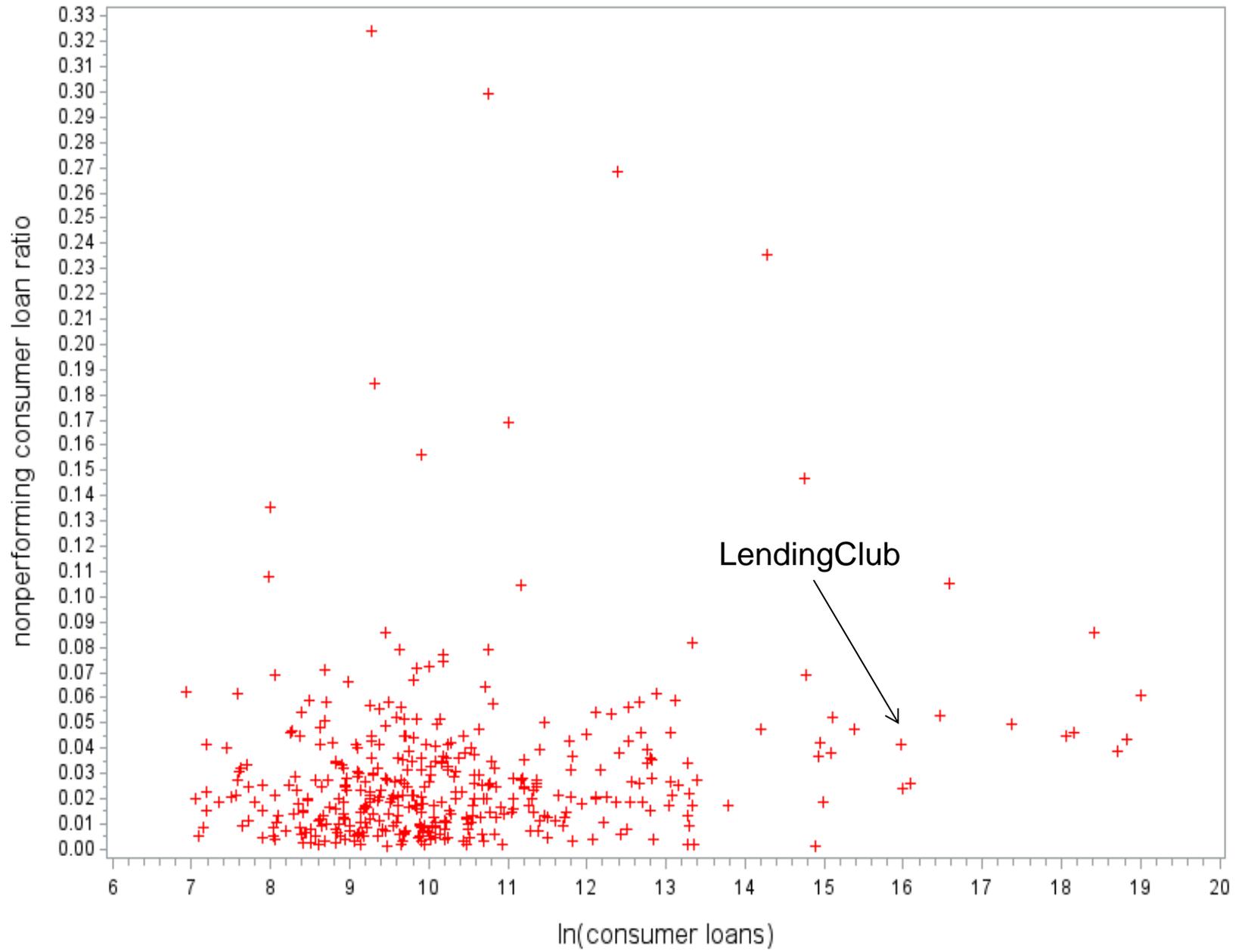
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- **Lending performance inefficiency**
 - observed ratio corrected for statistical noise
minus
 - best-practice ratio

2016

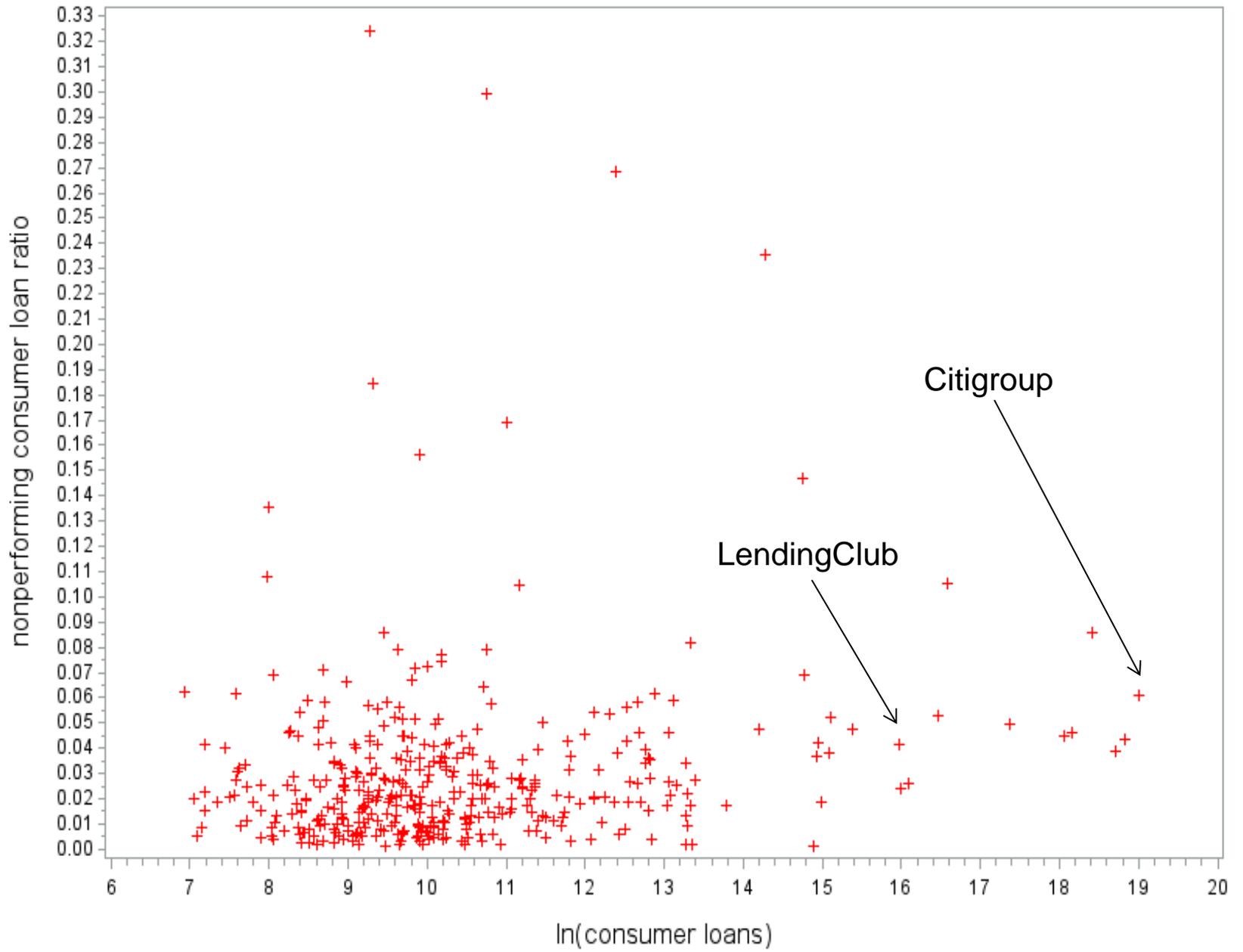
Unsecured Consumer Loans 2016



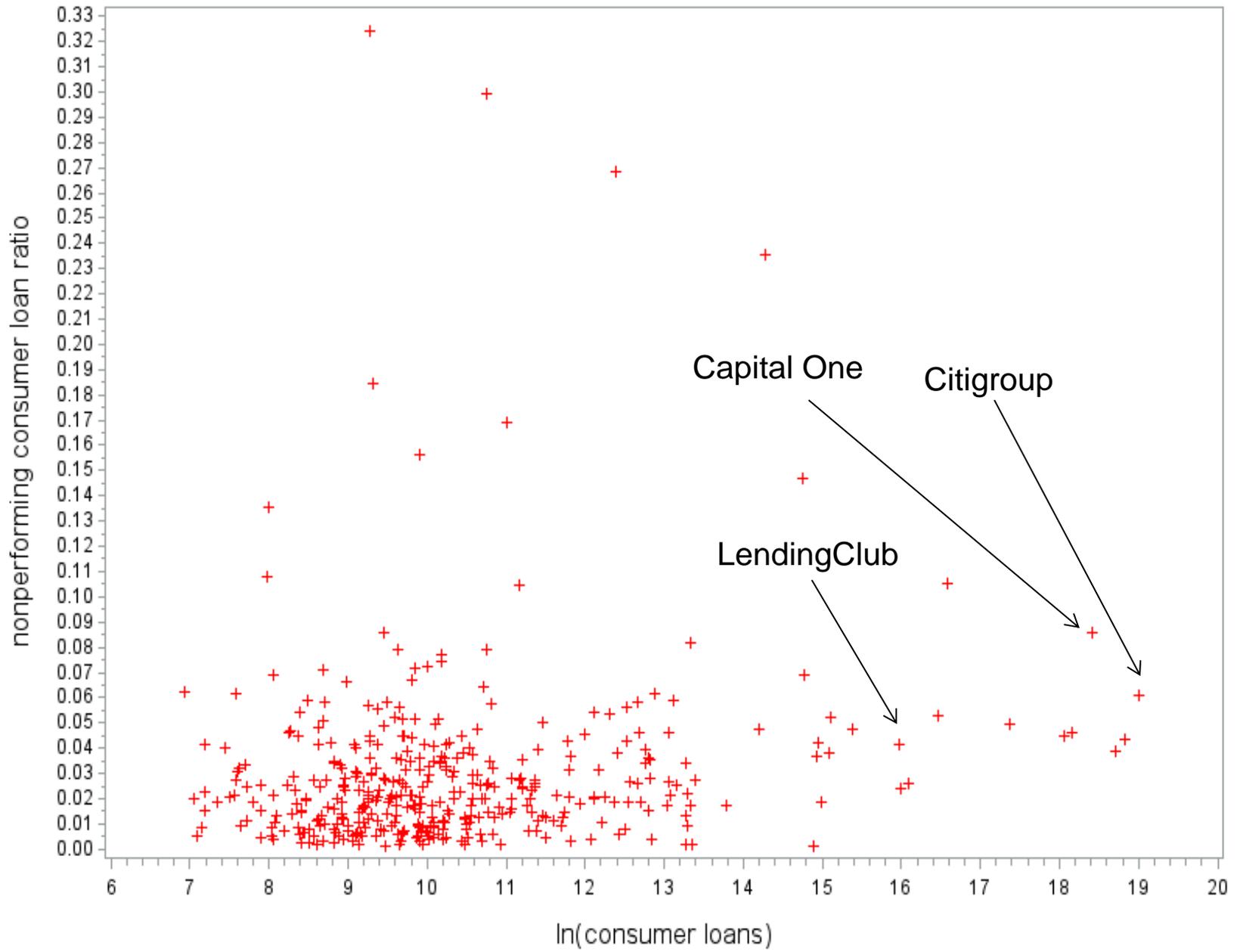
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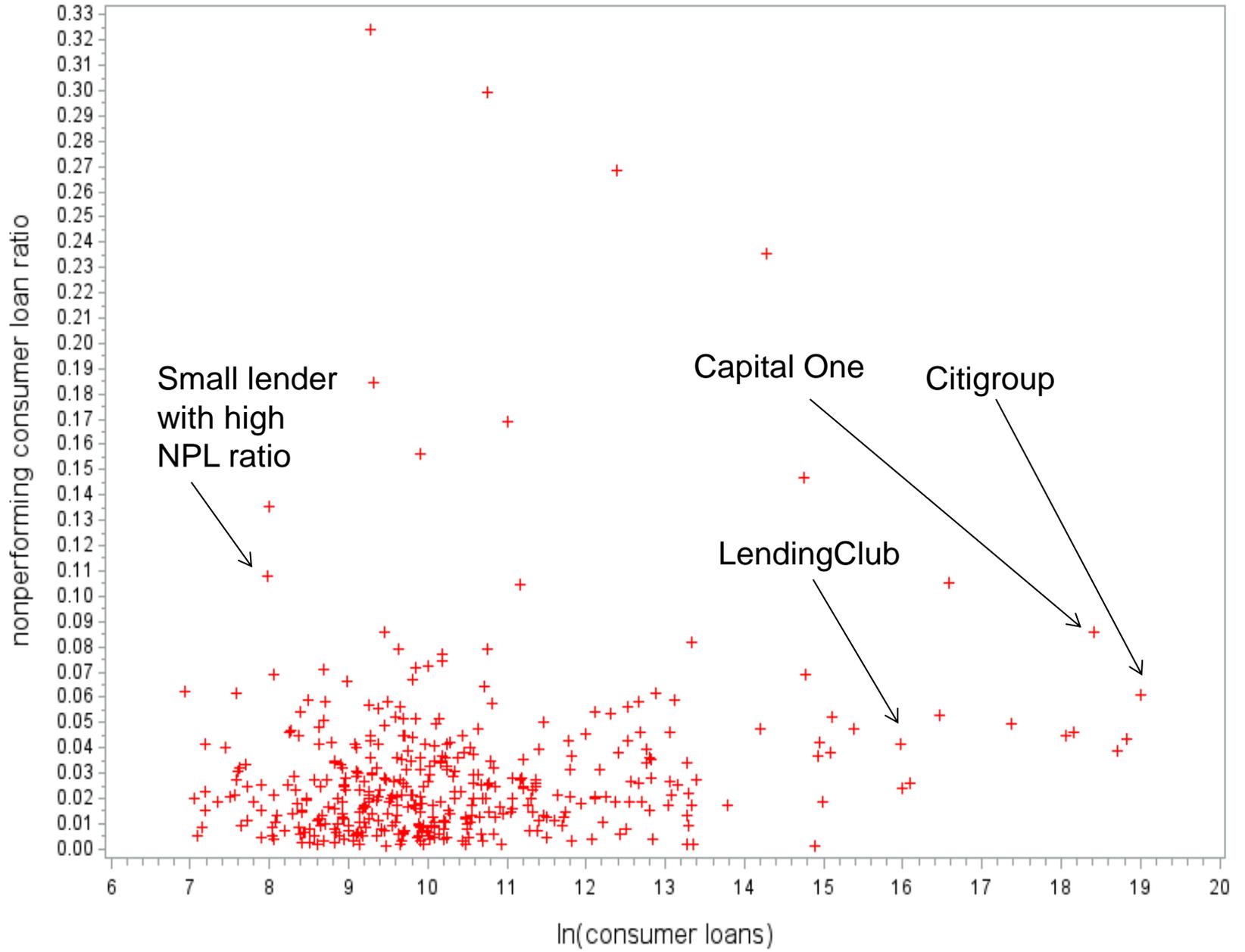
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Comparing Nonperforming Unsecured Consumer Loan Ratios

- 2016 Median Nonperforming Loan Ratios by Asset Size Groups in Billions of Dollars

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- For unsecured consumer loans, the median nonperforming loan (NPL) ratio increases with the asset size of bank lenders.

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 - less skill at assessing credit risk and managing loans?

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- Decompose the nonperforming unsecured consumer loan ratio into
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 - the portion due to lending to risky borrowers who default more often (**inherent credit risk**)
 - the portion due to less skill at assessing credit risk and managing loans (**lending performance inefficiency**)
- Compare unsecured consumer lending by traditional banks to LendingClub in terms of
 - inherent credit risk
 - lending (performance) inefficiency

Explaining the nonperforming loan ratio in terms of risk vs skill?

- Estimate the **best-practice (minimum) nonperforming consumer loan ratio** by stochastic frontier techniques (eliminates luck)
- The ratio the bank would achieve if it were **fully efficient at credit risk evaluation and loan management** – its inherent credit risk.

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- The ratio the bank would achieve if it were **fully efficient at credit risk evaluation and loan management** – its inherent credit risk.
- **Fully efficient relative to its peers**
 - GDP growth rate, banking market concentration
 - Consumer and total lending volume
 - Average contractual consumer lending interest rate

Specifying the Best-Practice Frontier

Defining Peer Groups

- Hughes and Mester (2015)
- “These variables define the peer group that determines best-practice performance against which a particular bank’s performance is judged.
- “If something extraneous to the production process is included in the specification, this might lead to too narrow a peer group and an overstatement of a bank’s level of efficiency.
- “Moreover, the variables included determine which type of inefficiency gets penalized.

Specifying the Best-Practice Frontier

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- “If it turned out that rural banks are more efficient than urban banks, all else equal, **the inefficient choice of location would not be penalized.**”

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 - Average contractual interest charged on consumer loans
 - Adverse selection of borrowers in terms of credit risk
 - Financial pressure on borrowers

Specifying the Best-Practice Frontier

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- **Lender advantages** that improve borrower selection
 - Better credit risks apply for any particular average contractual interest rate

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 - Lender that offers convenient application process
 - Lender that makes speedy credit decisions
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- Better selection reduces expected NPL ratio at any contractual interest rate – **more efficient**

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X is a vector consisting of loan volumes and control variables

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$\mu_i (> 0) \sim \theta \exp(-\theta u)$ one-sided (performance inefficiency)

Stochastic Frontier Decomposition

$$NP_i = X\beta + \varepsilon_i \quad \text{where } \varepsilon_i = \nu_i + \mu_i$$

- **Best-practice** (conditional) nonperforming ratio

best-practice $NP_i = X\beta$

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noise $= E(v_i | \varepsilon_i)$

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noise-adjusted $NP_i = NP_i - E(v_i | \varepsilon_i)$

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noise-adjusted $NP_i = NP_i - E(v_i | \varepsilon_i)$
- **Lending Performance Inefficiency** (excess nonperforming loan ratio)
excess $NP_i = E(\mu_i | \varepsilon_i)$

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- $NP_i = \text{best-practice } NP_i + \text{excess } NP_i + \text{statistical noise}_i$
 $= \text{inherent credit risk}_i + \text{inefficiency}_i + \text{statistical noise}_i$
 $= X\beta + E(\mu_i | \varepsilon_i) + E(\nu_i | \varepsilon_i)$

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 - **Lending Performance Inefficiency**
excess $NP_i = E(\mu_i | \varepsilon_i)$
- $NP_i =$ **best-practice** $NP_i +$ **excess** $NP_i +$ *statistical noise*
 $=$ **inherent credit risk** $_i +$ *inefficiency* $_i +$ *statistical noise* $_i$
 $=$ **$X\beta$** $+ E(\mu_i | \varepsilon_i) + E(\nu_i | \varepsilon_i)$

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- **Lending Performance Inefficiency**
excess $NP_i = E(\mu_i | \varepsilon_i)$

$$\begin{aligned} NP_i &= \text{best-practice } NP_i + \text{excess } NP_i + \text{statistical noise}_i \\ &= \text{inherent credit risk}_i + \text{inefficiency}_i + \text{statistical noise}_i \\ &= X\beta + E(\mu_i | \varepsilon_i) + E(\nu_i | \varepsilon_i) \end{aligned}$$

Stochastic Frontier Decomposition

$$NP_i = X\beta + \varepsilon_i \quad \text{where } \varepsilon_i = \nu_i + \mu_i$$

- **Best-practice** (conditional) nonperforming ratio
best-practice $NP_i = X\beta$
 - Portion of the ratio due to **statistical noise**
noise $\nu_i = E(\nu_i | \varepsilon_i) = \varepsilon_i - E(\mu_i | \varepsilon_i)$
 - **Noise-adjusted observed** nonperforming ratio
noise-adjusted $NP_i = NP_i - E(\nu_i | \varepsilon_i)$
 - **Lending Performance Inefficiency**
excess $NP_i = E(\mu_i | \varepsilon_i)$
- $NP_i = \text{best-practice } NP_i + \text{excess } NP_i + \text{statistical noise}_i$
 $= \text{inherent credit risk}_i + \text{inefficiency}_i + \text{statistical noise}_i$
 $= X\beta + E(\mu_i | \varepsilon_i) + E(\nu_i | \varepsilon_i)$

Stochastic Frontier Decomposition

$$NP_i = X\beta + \varepsilon_i \quad \text{where } \varepsilon_i = v_i + \mu_i$$

- **Best-practice** (conditional) nonperforming ratio
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noise $= E(v_i | \varepsilon_i) = \varepsilon_i - E(\mu_i | \varepsilon_i)$
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noise-adjusted $NP_i = NP_i - E(v_i | \varepsilon_i)$
- **Lending Performance Inefficiency**
 $NP_i = X\beta + v_i + \mu_i$

Stochastic Frontier Decomposition

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noise-adjusted $NP_i = NP_i - E(v_i|\varepsilon_i)$
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 $NP_i = X\beta + v_i + \mu_i$
 $[NP_i - E(v_i|\varepsilon_i)] = X\beta + E(\mu_i|\varepsilon_i)$

Stochastic Frontier Decomposition

$$NP_i = X\beta + \varepsilon_i \quad \text{where } \varepsilon_i = v_i + \mu_i$$

- **Best-practice** (conditional) nonperforming ratio

$$\textit{best-practice } NP_i = X\beta$$

- Portion of the ratio due to **statistical noise**

$$\textit{noise}_i = E(v_i | \varepsilon_i) = \varepsilon_i - E(\mu_i | \varepsilon_i)$$

- **Noise-adjusted observed** nonperforming ratio

$$\textit{noise-adjusted } NP_i = NP_i - E(v_i | \varepsilon_i)$$

- **Lending Performance Inefficiency**

$$NP_i = X\beta + v_i + \mu_i$$

$$[NP_i - E(v_i | \varepsilon_i)] = X\beta + E(\mu_i | \varepsilon_i)$$

$$\textit{noise-adjusted } NP_i$$

Stochastic Frontier Decomposition

$$NP_i = X\beta + \varepsilon_i \quad \text{where } \varepsilon_i = v_i + \mu_i$$

- **Best-practice** (conditional) nonperforming ratio

$$\textit{best-practice } NP_i = X\beta$$

- Portion of the ratio due to **statistical noise**

$$\textit{noise}_i = E(v_i | \varepsilon_i) = \varepsilon_i - E(\mu_i | \varepsilon_i)$$

- **Noise-adjusted observed** nonperforming ratio

$$\textit{noise-adjusted } NP_i = NP_i - E(v_i | \varepsilon_i)$$

- **Lending Performance Inefficiency**

$$NP_i = X\beta + v_i + \mu_i$$

$$[NP_i - E(v_i | \varepsilon_i)] - X\beta = E(\mu_i | \varepsilon_i)$$

$$\textit{noise-adjusted } NP_i$$

Stochastic Frontier Decomposition

$$NP_i = X\beta + \varepsilon_i \quad \text{where } \varepsilon_i = v_i + \mu_i$$

- **Best-practice** (conditional) nonperforming ratio

$$\textit{best-practice } NP_i = X\beta$$

- Portion of the ratio due to **statistical noise**

$$\textit{noise}_i = E(v_i | \varepsilon_i) = \varepsilon_i - E(\mu_i | \varepsilon_i)$$

- **Noise-adjusted observed** nonperforming ratio

$$\textit{noise-adjusted } NP_i = NP_i - E(v_i | \varepsilon_i)$$

- **Lending Performance Inefficiency**

$$NP_i = X\beta + v_i + \mu_i$$

$$[NP_i - E(v_i | \varepsilon_i)] - X\beta = E(\mu_i | \varepsilon_i)$$

$$\textit{noise-adjusted } NP_i - \textit{best-practice } NP_i$$

Stochastic Frontier Decomposition

$$NP_i = X\beta + \varepsilon_i \quad \text{where } \varepsilon_i = v_i + \mu_i$$

- **Best-practice** (conditional) nonperforming ratio

$$\textit{best-practice } NP_i = X\beta$$

- Portion of the ratio due to **statistical noise**

$$\textit{noise}_i = E(v_i | \varepsilon_i) = \varepsilon_i - E(\mu_i | \varepsilon_i)$$

- **Noise-adjusted observed** nonperforming ratio

$$\textit{noise-adjusted } NP_i = NP_i - E(v_i | \varepsilon_i)$$

- **Lending Performance Inefficiency**

$$NP_i = X\beta + v_i + \mu_i$$

$$[NP_i - E(v_i | \varepsilon_i)] - X\beta = E(\mu_i | \varepsilon_i)$$

$$\textit{noise-adjusted } NP_i - \textit{best-practice } NP_i = \textit{excess } NP_i$$

Stochastic Frontier Decomposition

$$NP_i = X\beta + \varepsilon_i \quad \text{where } \varepsilon_i = v_i + \mu_i$$

- **Best-practice** (conditional) nonperforming ratio

$$\textit{best-practice } NP_i = X\beta$$

- Portion of the ratio due to **statistical noise**

$$\textit{noise}_i = E(v_i | \varepsilon_i) = \varepsilon_i - E(\mu_i | \varepsilon_i)$$

- **Noise-adjusted observed** nonperforming ratio

$$\textit{noise-adjusted } NP_i = NP_i - E(v_i | \varepsilon_i)$$

- **Lending Performance Inefficiency**

$$NP_i = X\beta + v_i + \mu_i$$

$$[NP_i - E(v_i | \varepsilon_i)] - X\beta = E(\mu_i | \varepsilon_i)$$

$$\textit{noise-adjusted } NP_i - \textit{best-practice } NP_i = \textit{inefficiency}_i$$

Caveats

- Our conclusions are limited to LendingClub and may not be generally applicable to fintechs.
- The efficiency metric is well-accepted, widely used, and conceptually sound, but is subject to data limitations:
 - different results might be observed under downturn conditions with higher delinquency
 - banks experienced operating through business cycles
- Efficiency measured by loan performance, not the cost or profit associated with lending.

The Data

- Top-tier US bank holding companies
- LendingClub
- Year-end 2013 and 2016
- Exclude banks with
 - total loans/assets < 0.10
 - unsecured consumer loans $< \$1$ million
 - nonperforming consumer loan ratio < 0.001
- 453 banks in 2016 → 398 banks with all data
- 872 banks in 2013 → 755 banks with all data

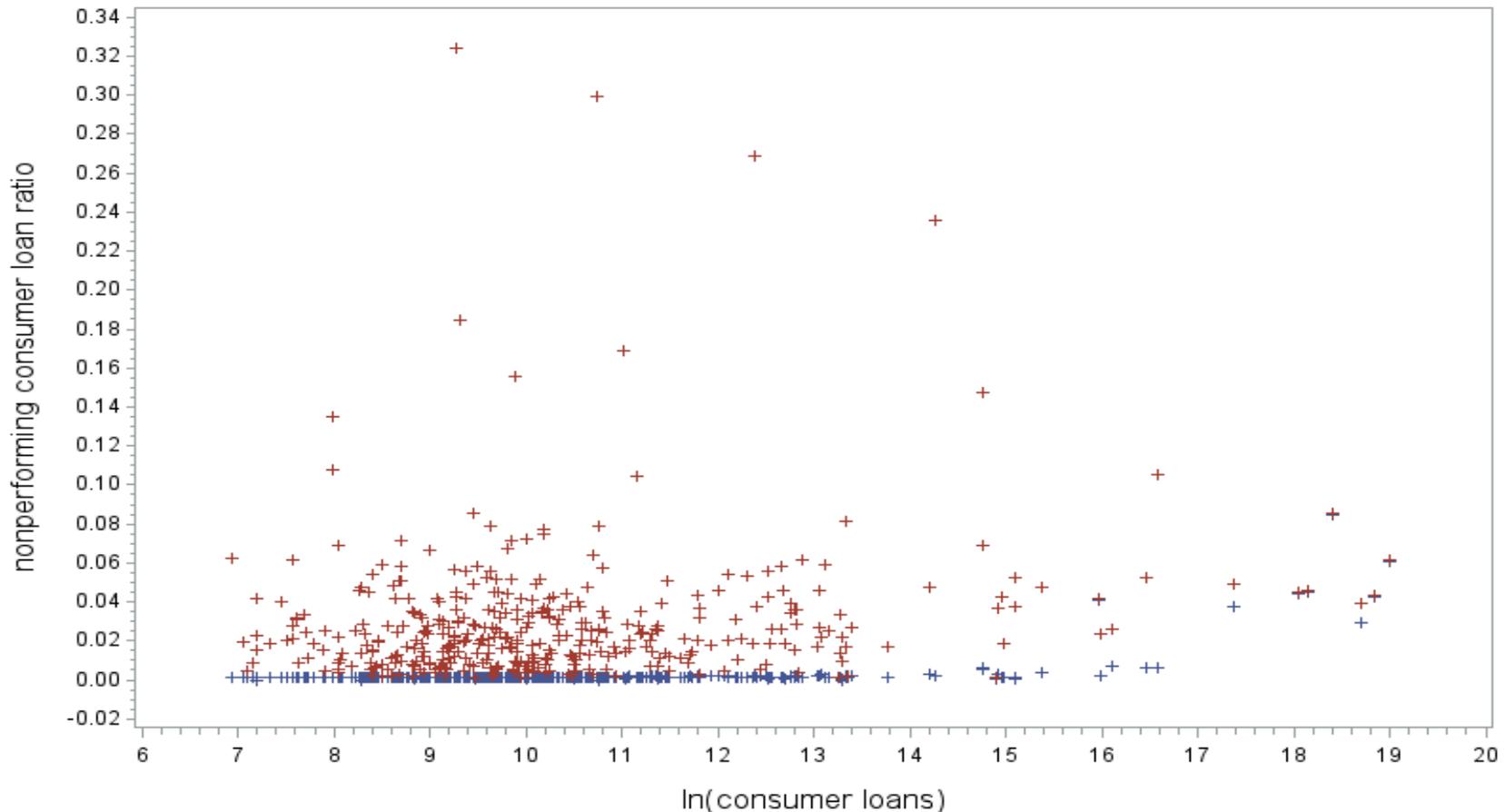
2016

Uncollateralized Consumer Loans 2016

Best Practice Nonperforming Consumer Loan Ratio vs Lending Inefficiency

Noise-Adjusted Observed Ratio (Red +) vs Best Practice Ratio (Blue +)

Lending Inefficiency = Noise-Adjusted Observed Ratio - Best Practice Ratio



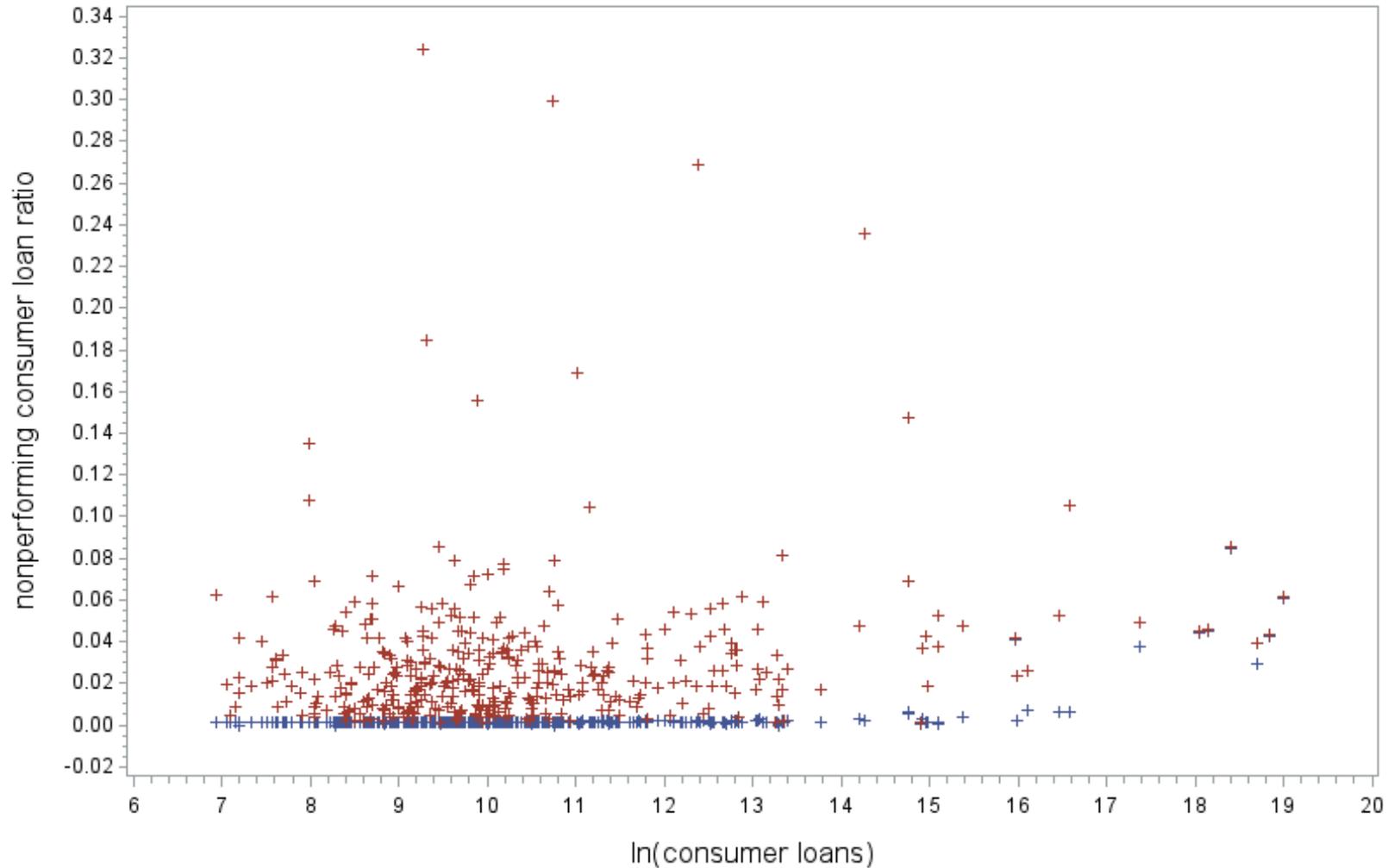
- Blue markers indicate the best-practice NPL ratios – the lower bound – inherent credit risk – best-practice increases with the volume of consumer loans.

Uncollateralized Consumer Loans 2016

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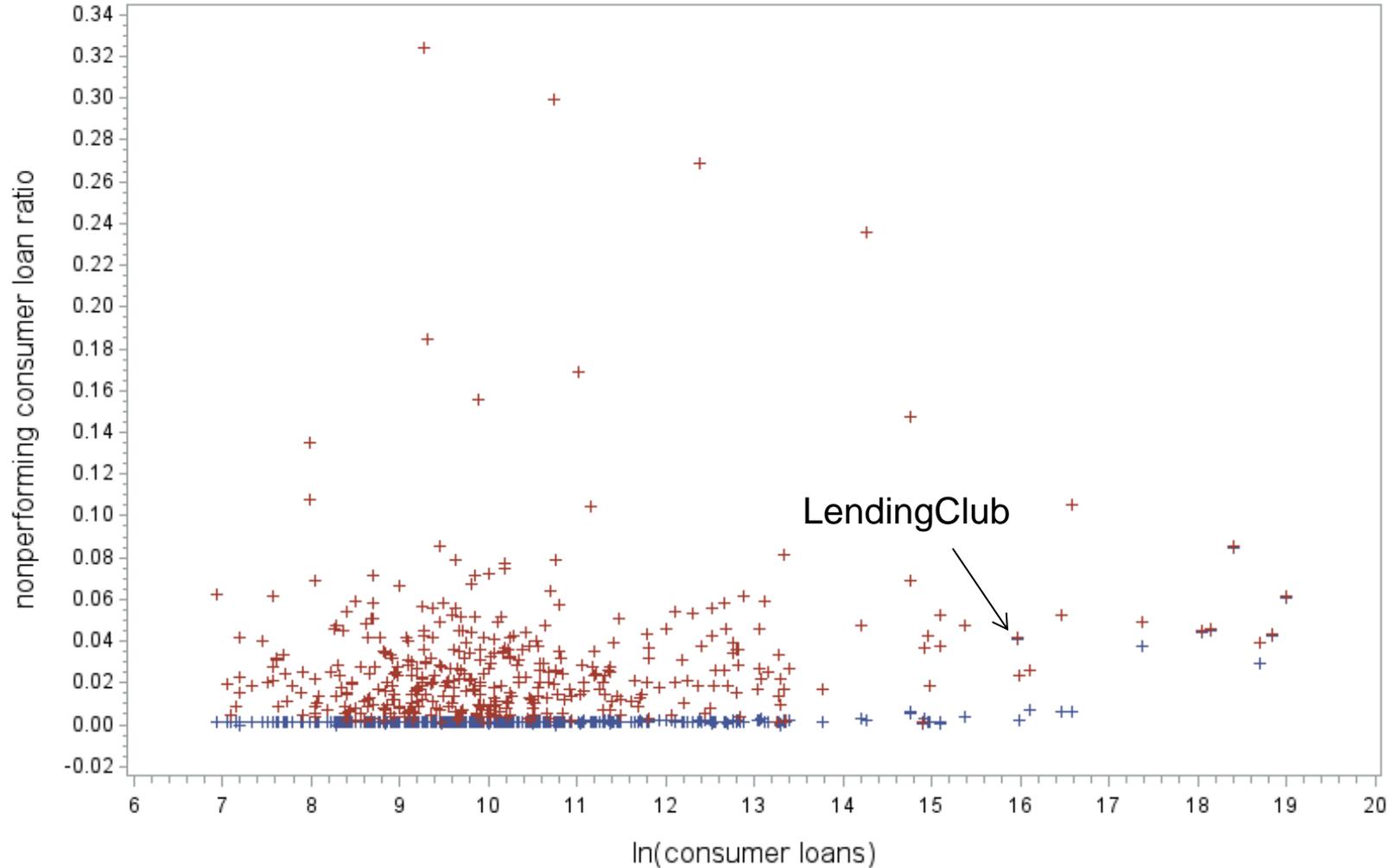


Uncollateralized Consumer Loans 2016

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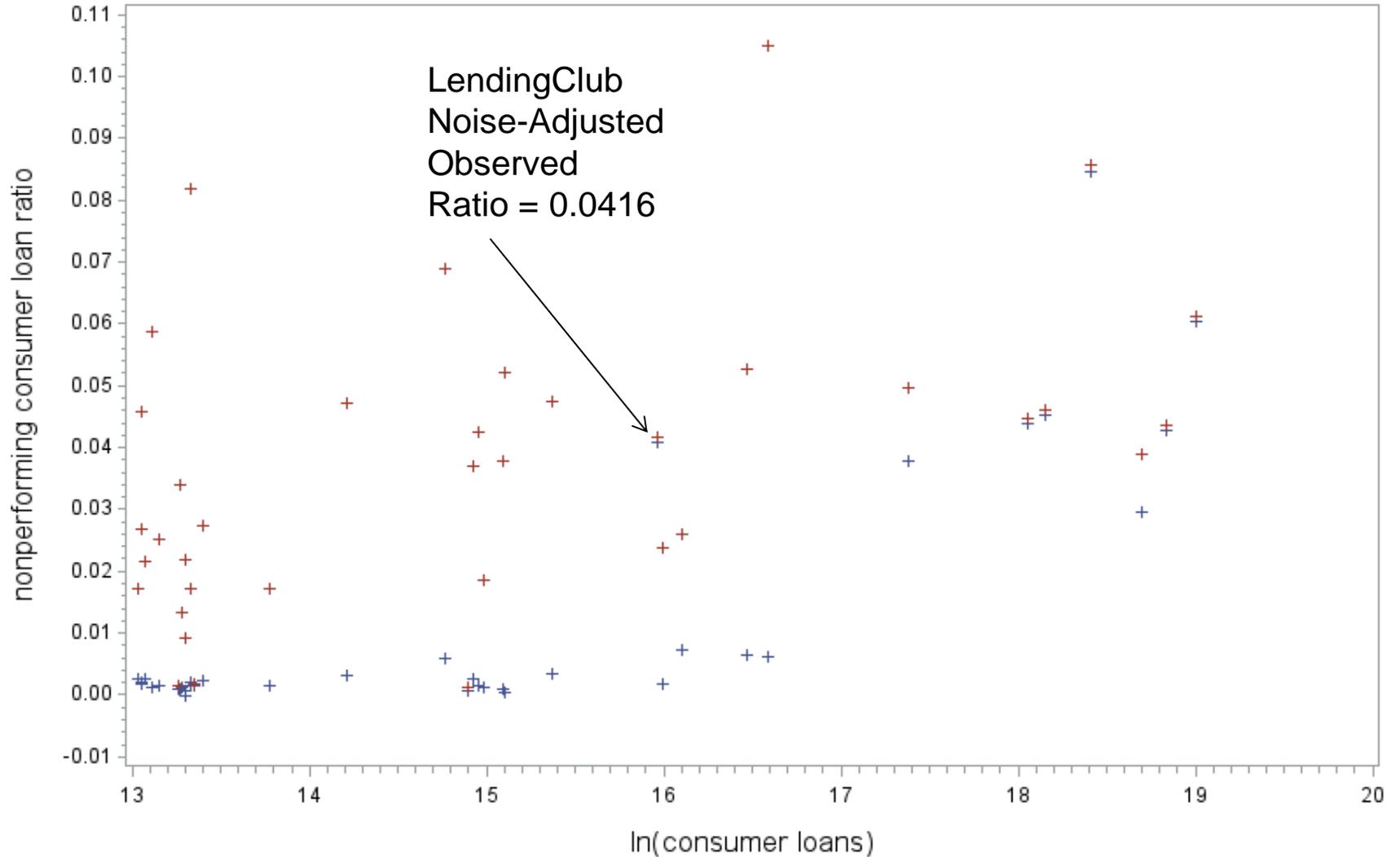


Uncollateralized Consumer Loans 2016

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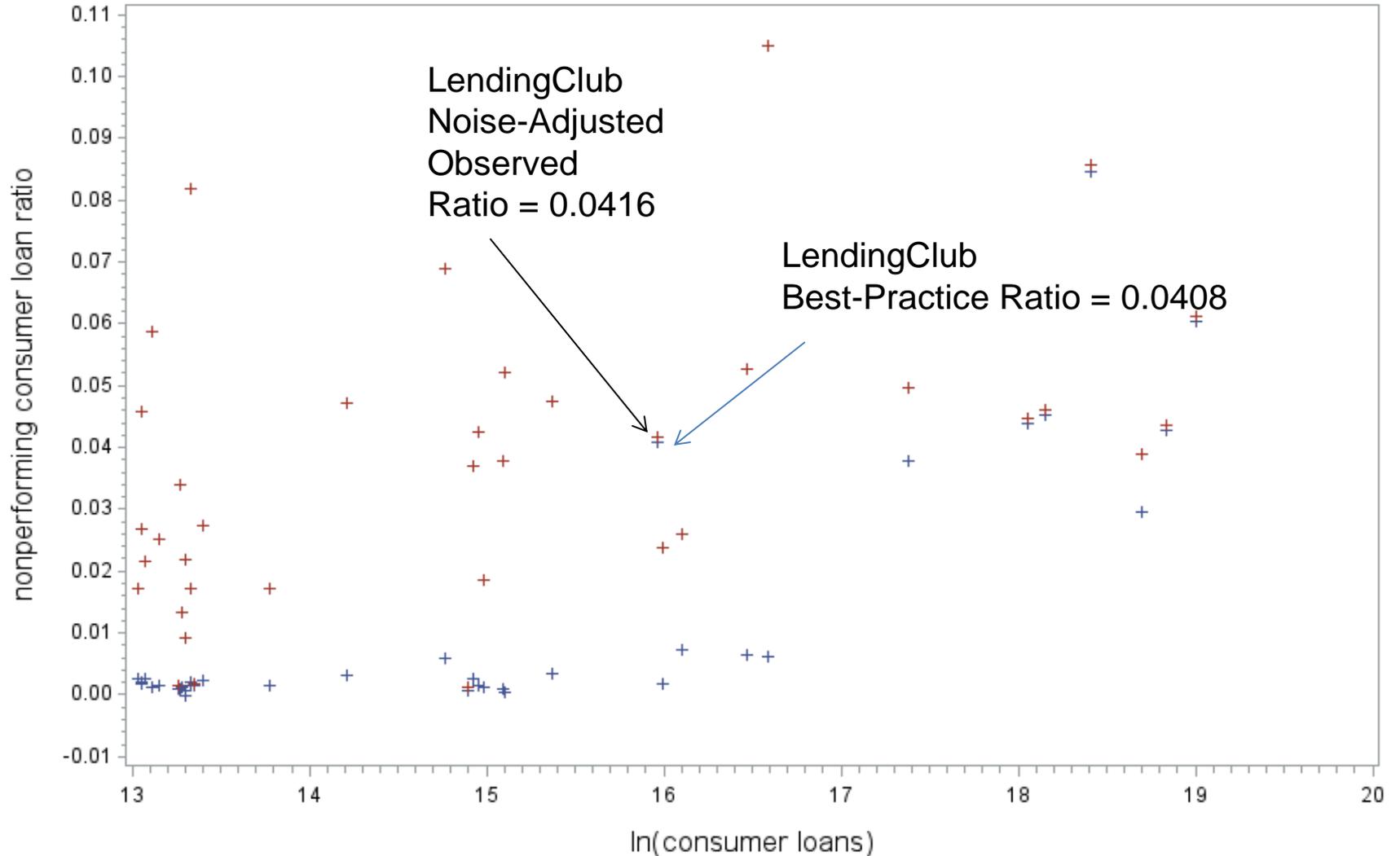


Uncollateralized Consumer Loans 2016

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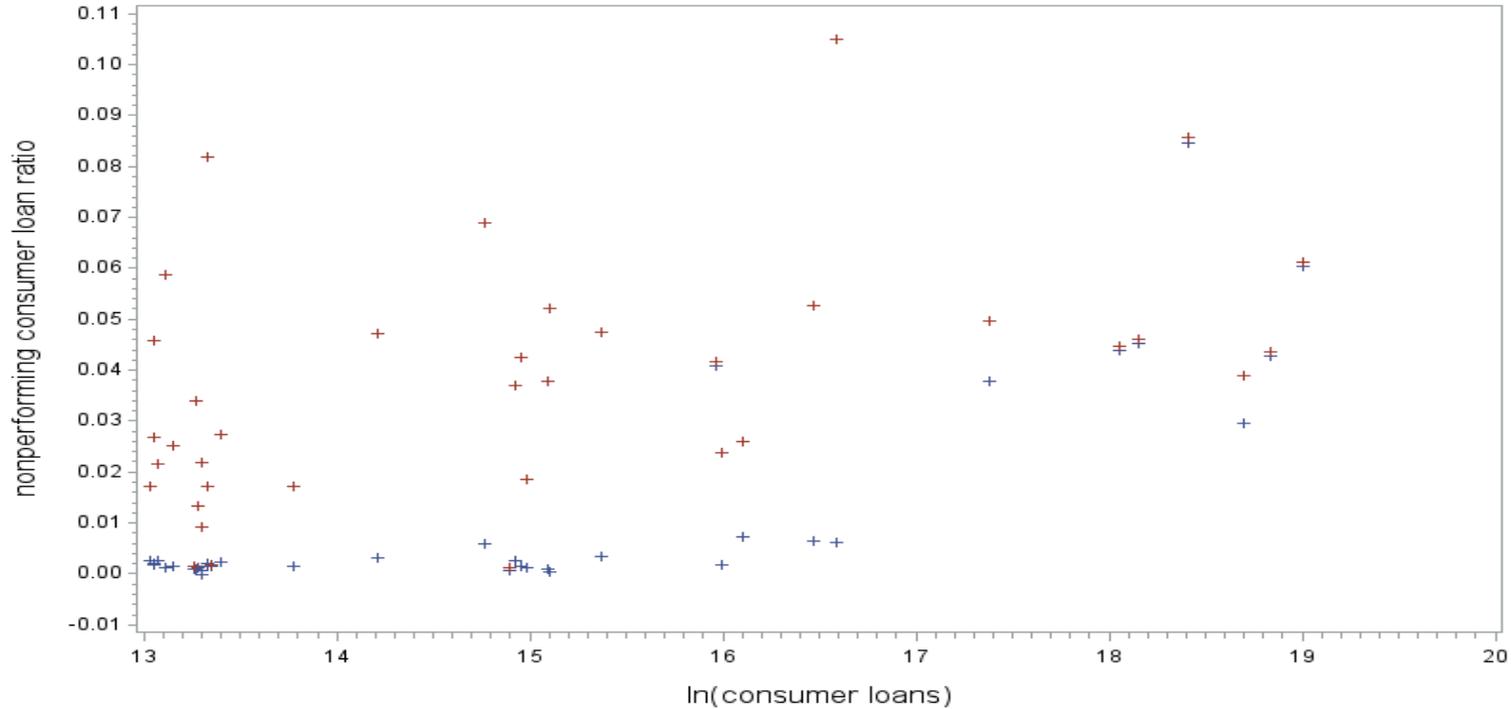


Uncollateralized Consumer Loans 2016

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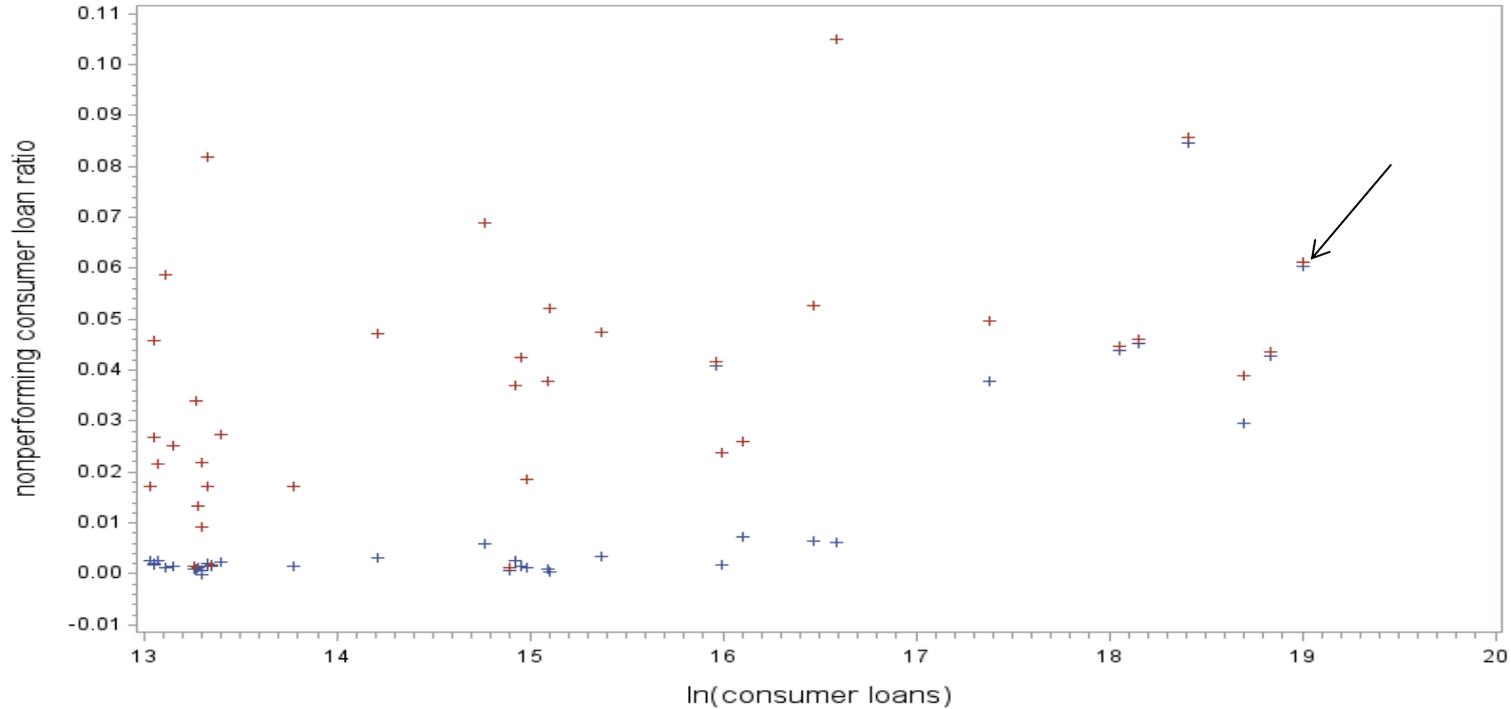
| Name | Book-Value of Assets | ln (Consumer Loans) | Noise-Adjusted Observed Ratio | Best Practice Ratio | Excess Over Best Practice | Average Contractual Interest Rate |
|------------------------|----------------------|---------------------|-------------------------------|---------------------|---------------------------|-----------------------------------|
| CITIGROUP | 1,792,077,000 | 19.004 | 0.0613 | 0.0603 | 0.0010 | 0.1216 |
| JPM CHASE | 2,490,972,000 | 18.837 | 0.0436 | 0.0428 | 0.0008 | 0.0760 |
| BANK OF AMERICA | 2,189,266,000 | 18.700 | 0.0391 | 0.0297 | 0.0093 | 0.0672 |
| SUNTRUST | 205,214,392 | 16.584 | 0.1051 | 0.0062 | 0.0989 | 0.0397 |
| LENDING CLUB | 5,563 | 15.967 | 0.0416 | 0.0408 | 0.0008 | 0.1382 |

Uncollateralized Consumer Loans 2016

Best Practice Nonperforming Consumer Loan Ratio vs Lending Inefficiency

Noise-Adjusted Observed Ratio (Red +) vs Best Practice Ratio (Blue +)

Lending Inefficiency = Noise-Adjusted Observed Ratio - Best Practice Ratio



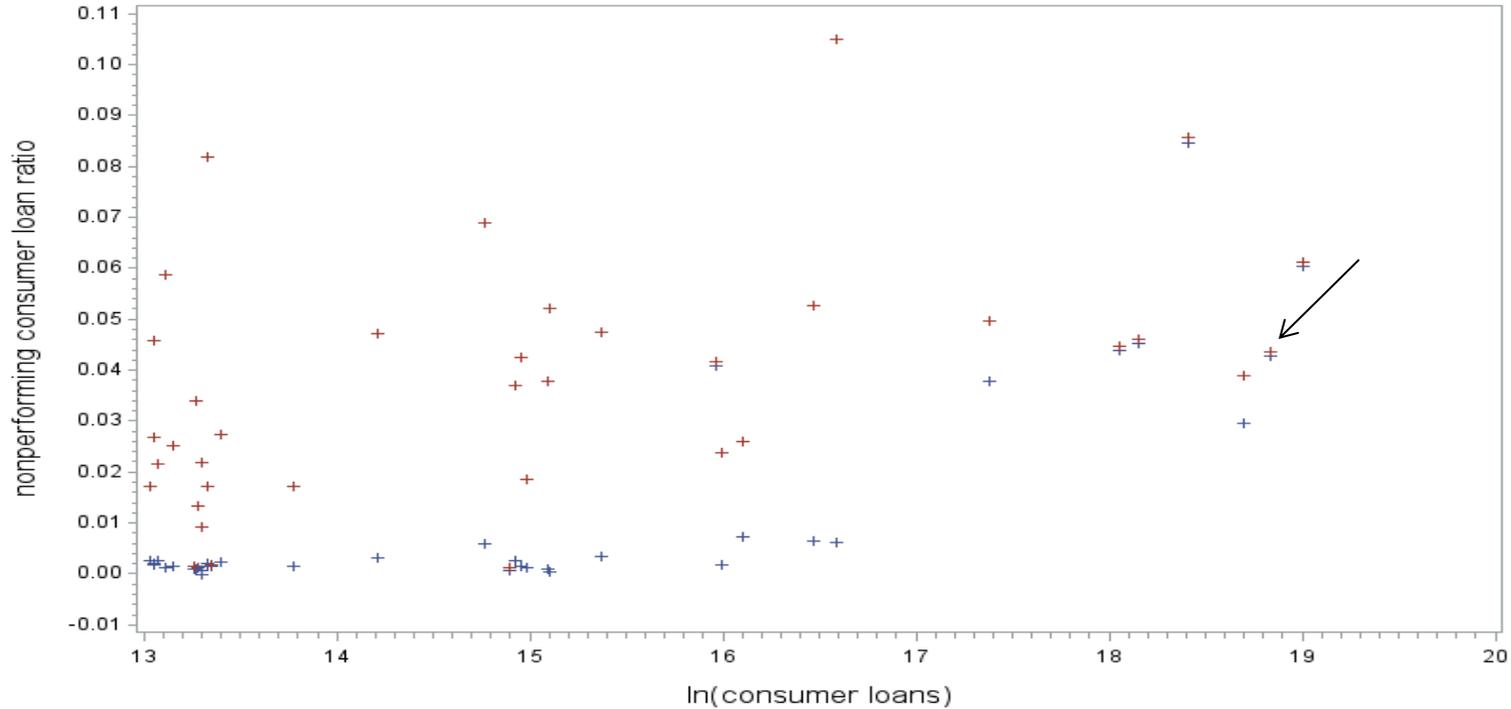
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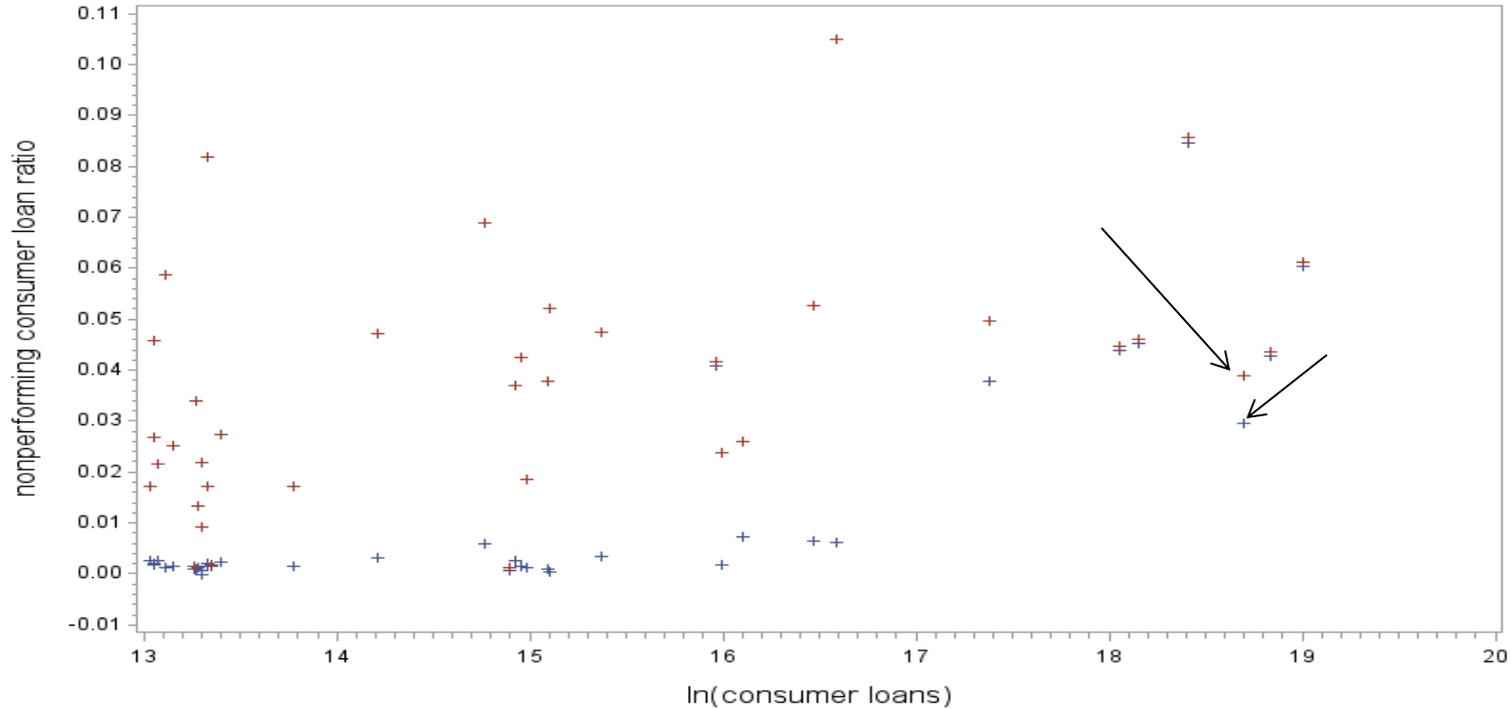
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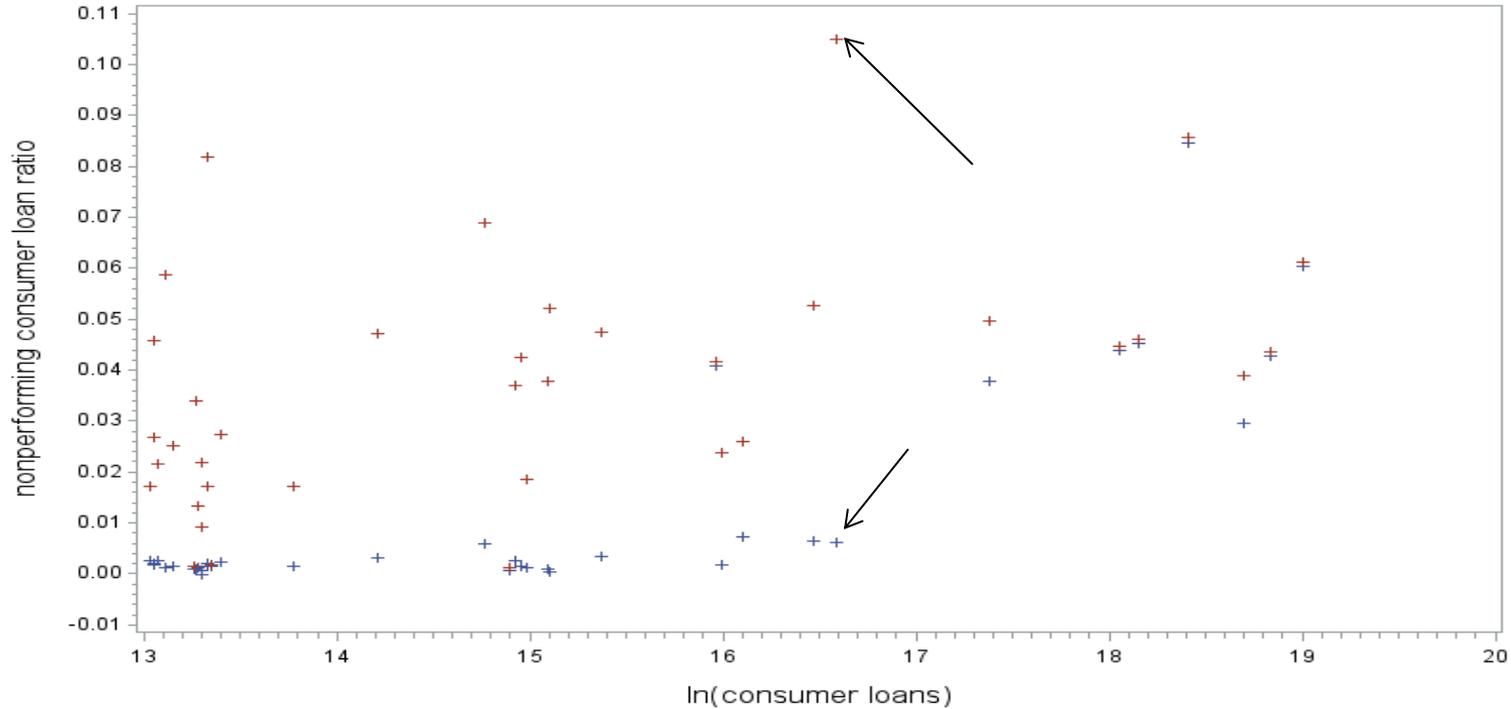
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Uncollateralized Consumer Loans 2016

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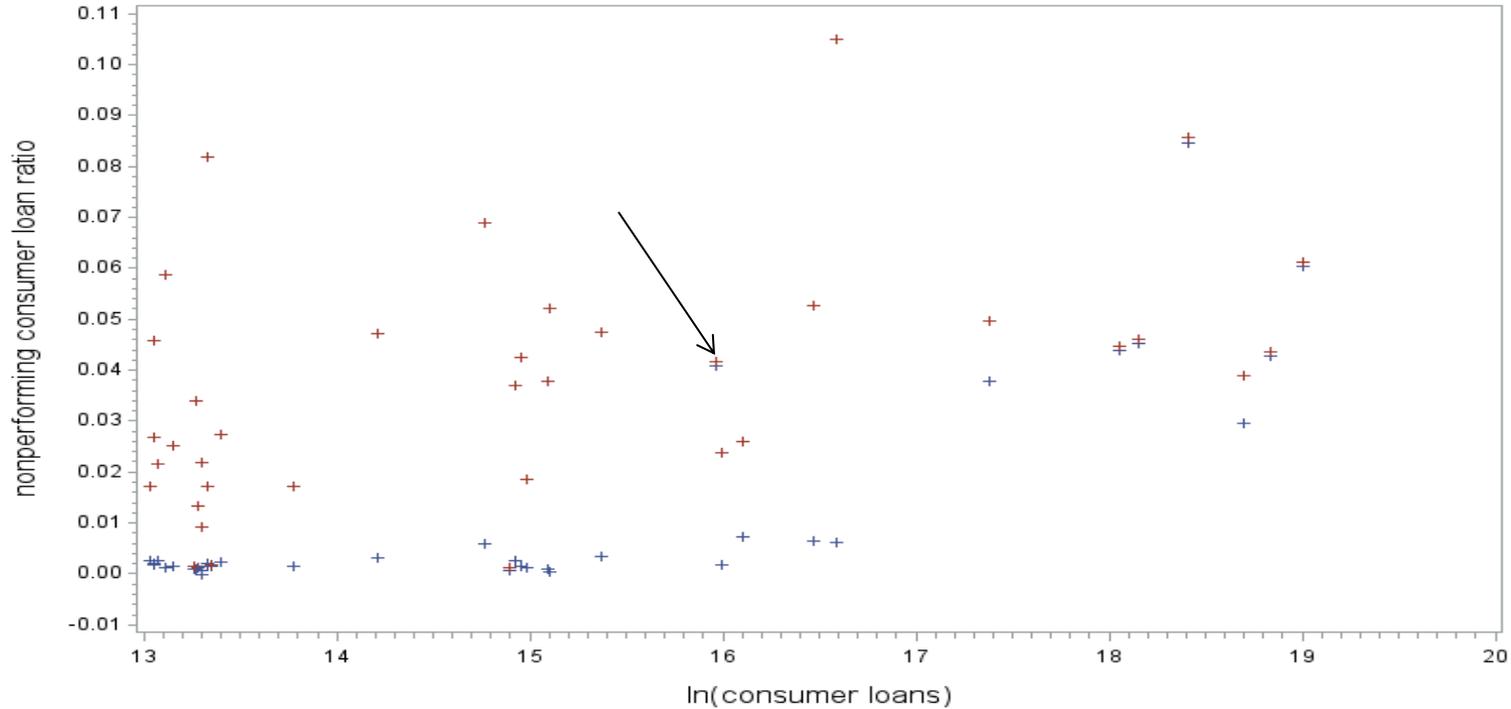
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Uncollateralized Consumer Loans 2016

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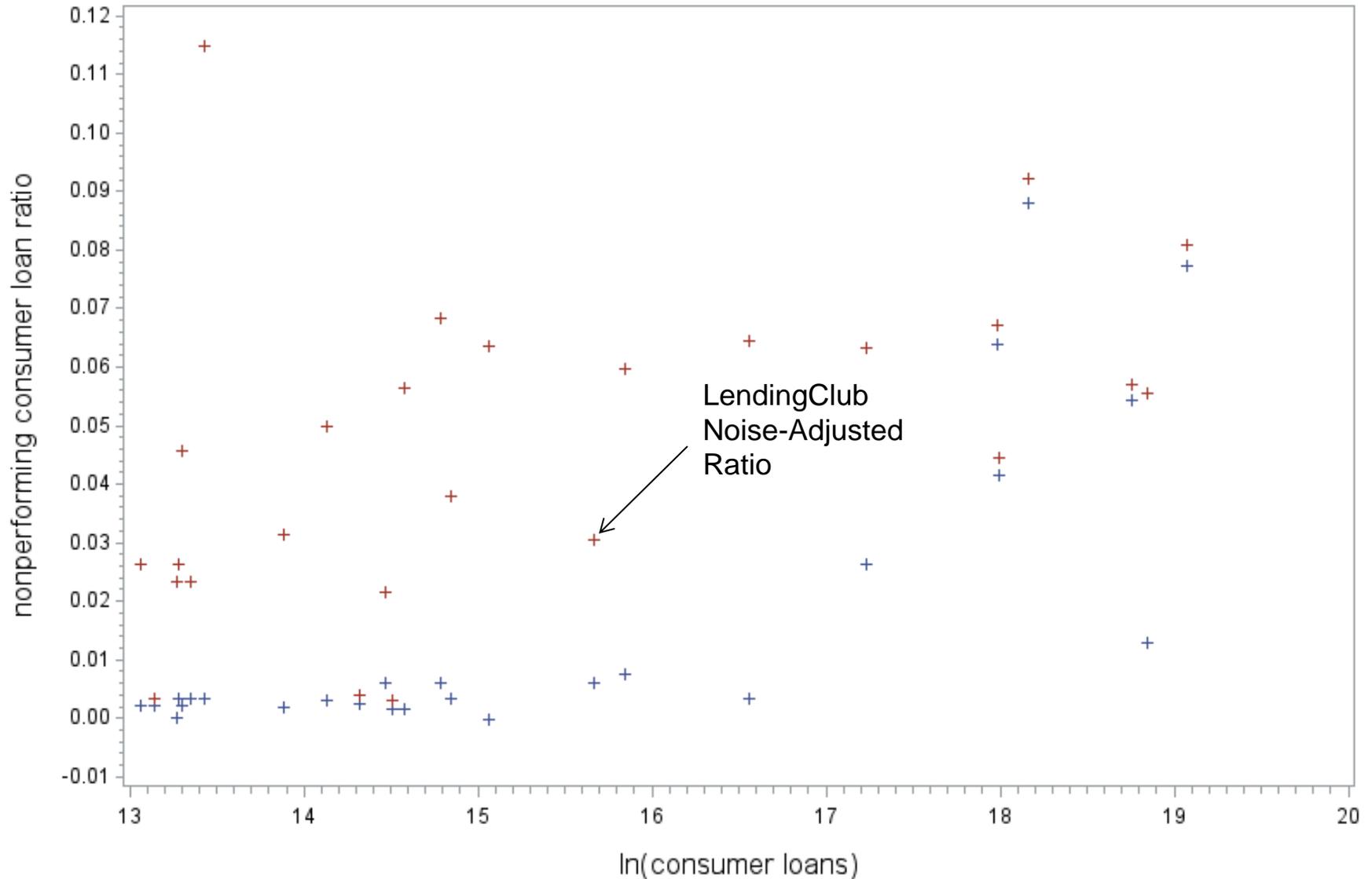
2013

Unsecured Consumer Loans 2013

Best Practice Nonperforming Consumer Loan Ratio vs Lending Inefficiency

Noise-Adjusted Observed Ratio (Red +) vs Best Practice Ratio (Blue +)

Lending Inefficiency = Noise-Adjusted Observed Ratio - Best Practice Ratio

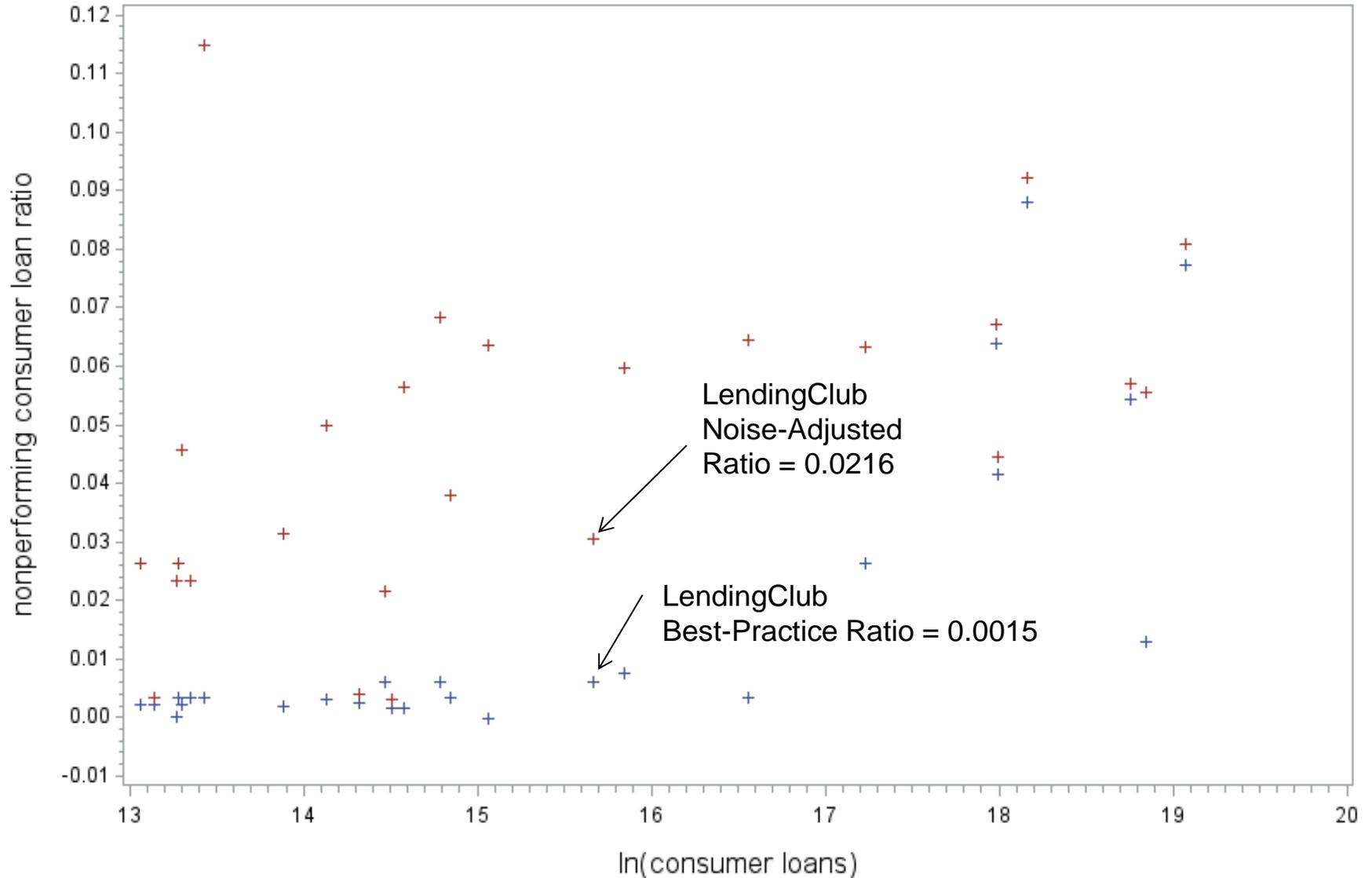


Unsecured Consumer Loans 2013

Best Practice Nonperforming Consumer Loan Ratio vs Lending Inefficiency

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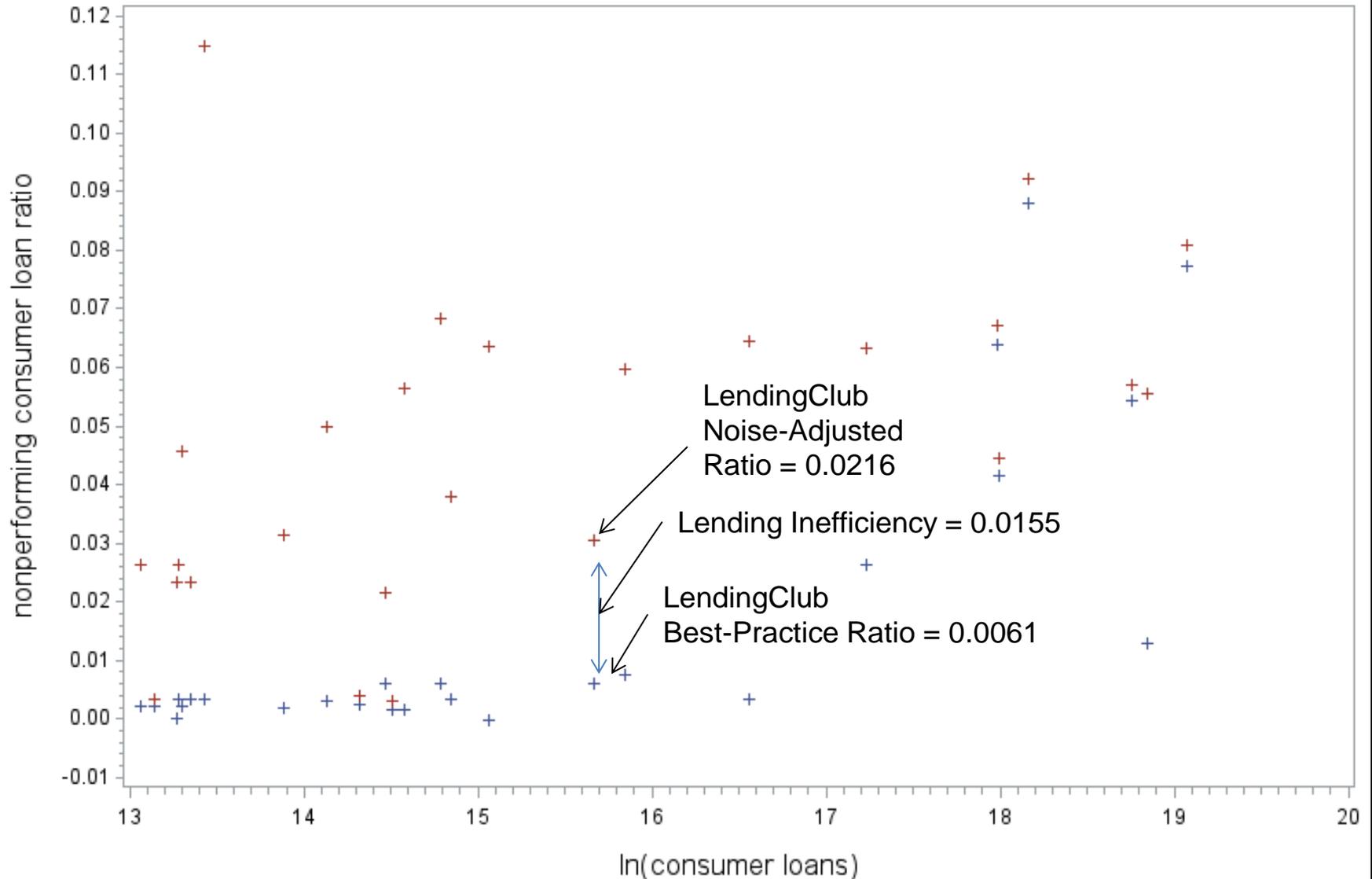


Unsecured Consumer Loans 2013

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Lending Inefficiency = Noise-Adjusted Observed Ratio - Best Practice Ratio



2016 Medians

2016 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- The median noise-adjusted NPL ratios differ between smaller and larger lenders.

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|--------|-------------------|------------------|-----------------|--------------|--------|
| Noise-Adjusted NPL Ratio | 0.0181 | 0.0215 | 0.0217 | 0.0420 | 0.0416 | 0.0496 |
| Best-Practice NPL Ratio | 0.0015 | 0.0015 | 0.0015 | 0.0024 | 0.0408 | 0.0428 |
| Excess NPL Ratio | 0.0165 | 0.0200 | 0.0212 | 0.0389 | 0.0008 | 0.0009 |

2016 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- The median noise-adjusted NPL ratios differ between **smaller** and larger lenders.

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2016 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- The noise-adjusted NPL ratio of LendingClub resembles that of the largest 2 lender groups.

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2016 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- LendingClub's inherent credit risk resembles that of the largest lending group.

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2016 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

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2016 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- Most of the NPL ratio is due to inherent credit risk for the largest group and LendingClub . . .

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
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| Excess NPL Ratio | 0.0165 | 0.0200 | 0.0212 | 0.0389 | 0.0008 | 0.0009 |

2016 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- Most of the NPL ratio is due to inherent credit risk – **not inefficiency**.

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|--------|-------------------|------------------|-----------------|-----------|--------|
| Noise-Adjusted NPL Ratio | 0.0181 | 0.0215 | 0.0217 | 0.0420 | 0.0416 | 0.0496 |
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2016 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- The largest lenders and LendingClub exhibit higher efficiency than the large lenders.

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|--------|-------------------|------------------|-----------------|--------------|--------|
| Noise-Adjusted NPL Ratio | 0.0181 | 0.0215 | 0.0217 | 0.0420 | 0.0416 | 0.0496 |
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| Excess NPL Ratio | 0.0165 | 0.0200 | 0.0212 | 0.0389 | 0.0008 | 0.0009 |

2016 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- The largest lenders and LendingClub exhibit higher efficiency than the large lenders.

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2013 Medians

2013 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- The smaller lenders and LendingClub exhibit lower NPL ratios than the larger bank lenders.

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|--------|-------------------|------------------|-----------------|--------------|--------|
| Noise-Adjusted NPL Ratio | 0.0244 | 0.0260 | 0.0286 | 0.0532 | 0.0216 | 0.0639 |
| Best-Practice NPL Ratio | 0.0025 | 0.0025 | 0.0024 | 0.0037 | 0.0061 | 0.0479 |
| Excess NPL Ratio | 0.0220 | 0.0234 | 0.0263 | 0.0494 | 0.0155 | 0.0039 |

2013 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- Smaller lenders and LendingClub exhibit lower NPL ratios than the larger bank lenders.

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|---------------|-------------------|------------------|-----------------|---------------|---------------|
| Noise-Adjusted NPL Ratio | 0.0244 | 0.0260 | 0.0286 | 0.0532 | 0.0216 | 0.0639 |
| Best-Practice NPL Ratio | 0.0025 | 0.0025 | 0.0024 | 0.0037 | 0.0061 | 0.0479 |
| Excess NPL Ratio | 0.0220 | 0.0234 | 0.0263 | 0.0494 | 0.0155 | 0.0039 |

2013 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- Smaller lenders and LendingClub exhibit lower inherent credit risk than the largest lenders.

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|--------|-------------------|------------------|-----------------|--------------|--------|
| Noise-Adjusted NPL Ratio | 0.0244 | 0.0260 | 0.0286 | 0.0532 | 0.0216 | 0.0639 |
| Best-Practice NPL Ratio | 0.0025 | 0.0025 | 0.0024 | 0.0037 | 0.0061 | 0.0479 |
| Excess NPL Ratio | 0.0220 | 0.0234 | 0.0263 | 0.0494 | 0.0155 | 0.0039 |

2013 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- Smaller lenders and LendingClub exhibit similar degrees of lending inefficiency.

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|--------|-------------------|------------------|-----------------|--------------|--------|
| Noise-Adjusted NPL Ratio | 0.0244 | 0.0260 | 0.0286 | 0.0532 | 0.0216 | 0.0639 |
| Best-Practice NPL Ratio | 0.0025 | 0.0025 | 0.0024 | 0.0037 | 0.0061 | 0.0479 |
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2013 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- Larger lenders experience much higher NPL ratios than LC and smaller lenders.

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|--------|-------------------|------------------|-----------------|-----------|--------|
| Noise-Adjusted NPL Ratio | 0.0244 | 0.0260 | 0.0286 | 0.0532 | 0.0216 | 0.0639 |
| Best-Practice NPL Ratio | 0.0025 | 0.0025 | 0.0024 | 0.0037 | 0.0061 | 0.0479 |
| Excess NPL Ratio | 0.0220 | 0.0234 | 0.0263 | 0.0494 | 0.0155 | 0.0039 |

2013 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- But the largest lenders assume much higher inherent credit risk than large lenders.

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|--------|-------------------|------------------|-----------------|--------------|--------|
| Noise-Adjusted NPL Ratio | 0.0244 | 0.0260 | 0.0286 | 0.0532 | 0.0216 | 0.0639 |
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- Most of the NPL ratio of the largest lenders is due to inherent credit risk . . .

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|--------|-------------------|------------------|-----------------|-----------|--------|
| Noise-Adjusted NPL Ratio | 0.0244 | 0.0260 | 0.0286 | 0.0532 | 0.0216 | 0.0639 |
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2013 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- Most of the NPL ratio of the largest lenders is due to inherent credit risk – **not inefficiency**.

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|--------|-------------------|------------------|-----------------|--------------|--------|
| Noise-Adjusted NPL Ratio | 0.0244 | 0.0260 | 0.0286 | 0.0532 | 0.0216 | 0.0639 |
| Best-Practice NPL Ratio | 0.0025 | 0.0025 | 0.0024 | 0.0037 | 0.0061 | 0.0479 |
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2013 Median Nonperforming Loan Ratios by Volume of Unsecured Consumer Lending

- Most of the NPL ratio of large bank lenders (\$1 billion - \$10 billion) is due to **inefficiency**.

| | < 10 M | > 10 M < 100 M | > 100 M < 1 B | > 1 B < 10 B | Lend Club | > 10 B |
|--------------------------|--------|-------------------|------------------|-----------------|-----------|--------|
| Noise-Adjusted NPL Ratio | 0.0244 | 0.0260 | 0.0286 | 0.0532 | 0.0216 | 0.0639 |
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- Protecting charter value vs exploiting deposit insurance (Marcus 1984)

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 - excess nonperformance ratio (lending inefficiency)

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- “How Bad Is a Bad Loan?” Hughes and Moon (2017)
 - Nonperforming loan ratio decomposed
 - best-practice ratio (inherent credit risk)
 - excess nonperformance ratio (lending inefficiency)
 - Largest financial institutions (2013)
 - Highest ratio of nonperforming loans
 - Highest inherent credit risk
 - Lowest lending inefficiency

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 - **Higher inherent credit risk** associated with **higher** market value at 104 banks larger than \$3.3 billion in assets – **statistically significant at 37 large banks**
 - Evidence of dichotomous value-maximizing lending strategies

Conclusions

- Largest lenders
 - highest median rate of NPL of 5 size groups
 - highest inherent credit risk among 5 size groups
 - smallest lending performance inefficiency of the groups
- Second largest group
 - High median NPL ratio similar to largest group
 - Lower inherent credit risk and higher inefficiency
- LendingClub belongs to second largest group.
 - Much higher inherent credit risk than this group
 - Much lower lending performance inefficiency
 - Similar to the characteristics of largest bank lenders
- Higher inherent credit risk may be value maximizing.

Thank you.