DOES SCALE DEFINE THE WINNERS IN BANKING?

Joseph P. Hughes
Rutgers University

“Ending Too Big to Fail” Policy Symposium
Federal Reserve Bank of Minneapolis

April 4, 2016
Does Scale Define the Winners in Banking?
Costs of Breaking Them Up
DOES SCALE DEFINE THE WINNERS IN BANKING?

COSTS **BUT NOT THE BENEFITS**
The Questions about Winners

• Are there good business reasons for banks to be big?
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• Are there any good business reasons for banks to be big?
• Apart from growing to obtain cost-of-funds advantages associated with TBTF status.
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• If so, would limiting their size or breaking them up work against market forces?
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• And create incentives to evade restrictions?
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• And new sources of systemic risk?
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• Do the largest financial institutions experience scale economies?
• If so, how large are the economies?
The Questions about Winners

• Are there are good business reasons for banks to be big?

• Do the largest financial institutions experience scale economies?

• If so, how large are the economies?

• If technological scale economies exist, is it possible that they can be achieved by smaller institutions than the largest we observe today?
The Questions about Winners

• If scale economies exist, do the economies result from technology or from cost-of-funds subsidies?
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• Would restricting scale reduce their cost efficiency and global competitiveness?
The Winners

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• Bigger banks enjoy higher economies of scale – lower average cost of products than smaller banks.

• Then, are there are good business reasons for banks to be big?

• Earlier research did not find economies of scale at big banks.
The Received Wisdom

• Alan Greenspan, “The Crisis” (2010)

• “For years the Federal Reserve had been concerned about the ever larger size of our financial institutions.”
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Is the Finding of Diseconomies at the Largest Institutions Credible?

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• Textbooks assert that scale economies characterize banking.
• Large institutions have historically continued to grow larger.
• Larger institutions offer financial products not available at smaller institutions.
• Institutions merge and cross borders to create larger institutions.
• But becoming large to obtain too-big-to-fail subsidies may overcome diseconomies.
Who Has Found Evidence of Scale Economies at Large Banks?

- Hughes, Lang*, Mester*, and Moon (*JMCB* 1996)
- Berger* and Mester* (*JBF* 1997)
- Hughes and Mester* (*ReStat* 1998)
- Hughes, Mester*, and Moon (*JBF* 2001)
- Bossone and Lee (*IMF* 2004)
- Wheelock* and Wilson (*JMCB* 2012, 2015)
- Feng and Serletis (*JBF* 2010)
- Hughes and Mester* (*JFI*, 2013)
- Dijkstra (2013)
- Becalli, Anolli, and Borello (*JBF* 2015)

*Current and former Federal Reserve System economists*
What do some of the critics of the largest financial institutions have to say?
Richard Fisher  
former President  
of the Federal Reserve Bank of Dallas

• "Hordes of Dodd-Frank regulators are not the solution; smaller, less complex banks are. We can select the road to enhanced financial efficiency by breaking up TBTF banks -- now."

Wall Street Journal, April 4, 2012
Sheila Bair
former chairman
of the Federal Deposit Insurance Corp.

- "The public-policy benefits of smaller, simpler banks are clear. It may be in the enlightened self-interest of shareholders as well."

Fortune, January 18, 2012
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Fortune, January 18, 2012
Phil Purcell  
former chief executive-Morgan Stanley

- "Breaking these companies into separate businesses would **double** to **triple** the shareholder value of each institution."

Richard Ramsden
Analyst, Goldman Sachs

• “The Fed’s recent G-SIB proposal raises JPM’s capital requirements to 11.5%, 100-200bp higher than money center peers, reigniting the debate about whether a breakup could unlock shareholder value given that size is now a regulatory negative.”

Goldman Sachs Report, January 2015
Richard Ramsden  
Analyst, Goldman Sachs

• “A breakup could create value … as each standalone business would face a lower G-SIB surcharge.”

• At the expense of $6-7 billion of net income synergies
Marianne Lake  
CFO, JP Morgan Chase  

• “. . . Ms. Lake, the chief financial officer, said JPMorgan should keep its current mix of businesses because it had around $18 billion in cost synergies from having all its business lines under the same roof.”  

Marianne Lake
CFO, JP Morgan Chase

“... Ms. Lake, the chief financial officer, said JPMorgan should keep its current mix of businesses because it had around $18 billion in cost synergies from having all its business lines under the same roof.

‘Scale has always defined the winner in banking,’ Ms. Lake said.”

What are scale economies?

• How minimum cost varies with output
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• A proportional increase in output
  – A less than proportional increase in cost
    • Cost elasticity < 1
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Economies of scale (increasing returns)
• $1 / \text{cost elasticity} > 1$
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  Economies of scale (increasing returns)
    • 1 / cost elasticity > 1

  – A more than proportional increase in cost
    • Cost elasticity > 1

Diseconomies of scale (decreasing returns)
  • 1 / cost elasticity < 1
What are the technological sources of scale economies?

• Standard textbook explanations of scale economies associated with larger output
  – spreading the overhead, especially the costs associated with information technology
  – diversification of liquidity risk
  – diversification of credit risk
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• Relatively fewer resources required to manage liquidity and credit risk
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• Relatively fewer resources required to manage liquidity and credit risk

• Network economies in payments
How are scale economies measured?

The relationship of cost to outputs

- Econometric estimation of cost
  \[ \text{Cost} = f(\text{outputs, input prices, equity, asset quality}) \]

- Common finding
  - Slight economies of scale at smaller banks
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The relationship of cost to outputs

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• Common finding
  – Slight economies of scale at smaller banks
  – Scale diseconomies at the largest banks
Why Are Scale Economies So Hard to Detect?

• Endogenous risk-taking effects cost.
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  – Improved risk-expected-return frontier
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• Larger banks generally take more risk.
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• Larger scale improves diversification.
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• Larger banks generally take more risk.

• Risk-taking influences cost.
Size-Related Improved Diversification

Source: Hughes and Mester (2015)
Size-Related Improved Diversification

Expected Return

ER_D
ER_C
ER_B
ER_A

Source: Hughes and Mester (2015)
Size-Related Improved Diversification

Expected Return

ER<sub>D</sub>  ER<sub>C</sub>  ER<sub>B</sub>  ER<sub>A</sub>

Larger Output

Smaller Output

Source: Hughes and Mester (2015)
Size-Related Improved Diversification

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Size-Related Improved Diversification

\[ \text{ER}_A, \text{ER}_B, \text{ER}_C, \text{ER}_D \]

\[ \text{Risk}_A, \text{Risk}_B, \text{Risk}_C, \text{Risk}_D \]

Source: Hughes and Mester (2015)
Size-Related Spreading Overhead

Source: Hughes and Mester (2015)
Size-Related Improved Diversification

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Size-Related Improved Diversification

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Size-Related Improved Diversification

Economies of Scale

- ER_D
- ER_C
- ER_B
- ER_A'
- ER_A

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Size-Related Improved Diversification

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Economies of Scale

Expected Return

ER_D
ER_C
ER_B
ER_A

A
A'
B
C
D

Larger Output
Smaller Output

0  Risk_A  Risk_A = Risk_B  Risk_C  Risk_D  Risk

Source: Hughes and Mester (2015)
Size-Related Improved Diversification

Economies of Scale

Source: Hughes and Mester (2015)
Size-Related Improved Diversification

Economies of Scale

Constant Returns to Scale

Larger Output

Smaller Output

Source: Hughes and Mester (2015)
## Size-Related Improved Diversification

### Economies of Scale

- **Expected Return**
  - $ER_D$
  - $ER_C$
  - $ER_B$
  - $ER_A$
  - $ER_A'$

### Constant Returns to Scale

- **Larger Output**
- **Smaller Output**

### Source:
 Hughes and Mester (2015)
Size-Related Improved Diversification

Economies of Scale

Constant Returns to Scale

ER_D
ER_C
ER_B
ER_A'
ER_A

Expected Return

Larger Output
Smaller Output

Risk_A' Risk_A = Risk_B Risk_C Risk_D Risk

Source: Hughes and Mester (2015)
Size-Related Improved Diversification

Expected Return

ER_D
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Economies of Scale

Diseconomies of Scale

Constant Returns to Scale

Source: Hughes and Mester (2015)
Size-Related Improved Diversification

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ER_A

Larger Output
Smaller Output

Source: Hughes and Mester (2015)
Size-Related Improved Diversification

Demsetz and Strahan, “Diversification, Size, and Risk at Bank Holding Companies, JMCB, 1997; size-related diversification of firm-specific risk controlling for sources of risk

Source: Hughes and Mester (2015)
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Source: Hughes and Mester (2015)
What is the effect of increased risk-taking on cost?

• **Diversification Effect**
  – Scale-related diversification tends to reduce cost elasticity

  *but*

• **Risk-taking Effect**
  – Additional risk-taking tends to increase cost elasticity

• Does the **risk-taking effect** mask cost economies due to the **diversification**?
Cost as a Function of Risk-Taking Incentives

• Standard minimum cost function
  – Captures technology without controlling for managerial risk preferences and endogenous risk-taking

Cost = f(outputs, input prices, equity, asset quality)
Cost as a Function of Risk-Return Choice

Source: Hughes and Mester (2015)
Cost as a Function of Risk-Taking Incentives

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Cost as a Function of Risk-Taking Incentives

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    \[ \text{Cost} = f(\text{outputs}, \text{input prices}, \text{equity}, \text{asset quality}) \]

• Model risk-return investment plan
    \[ \frac{\text{Profit}}{\text{Equity}} = f(\text{outputs}, \text{input prices}, \text{equity}, \text{asset quality}, \text{revenue characteristics}) \]
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    Profit/Equity = f(outputs, input prices, equity, asset quality, revenue characteristics)
    – Derive cost from ROE function
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Size-Related Improved Diversification

Economies of Scale

Source: Hughes and Mester (2015)
Finding the Elusive Benefits of Size

• “Do Big Banks Have Lower Operating Costs?”
  – Anna Kovner, James Vickery, and Lily Zhou (Federal Reserve Bank of New York, 2014)
  – What are operating (noninterest) expenses?
    • Corporate overhead (accounting, advertising, auditing, insurance, utilities, etc.)
    • Legal, Consulting, and Advisory
    • Information technology and data processing
    • Compensation and Benefits
    • Expenses for Building and Other Fixed Assets
Finding the Elusive Benefits of Size

• “Do Big Banks Have Lower Operating Costs?”

Operating Ratio

\[
= \frac{\text{noninterest expense}}{\text{net interest income} + \text{noninterest income}}
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1% increase in assets implies ratio

• decreases 1.320% (no controls)
Finding the Elusive Benefits of Size

• “Do Big Banks Have Lower Operating Costs?”

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• decreases 1.892% (controlling for asset allocation)
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• decreases 1.320% (no controls)
• decreases 1.892% (controlling for asset allocation)
• decreases 4.151% (controlling for asset allocation, revenue sources, funding structure, business concentration, and organizational complexity)
Size-Related Improved Diversification

Source: Hughes and Mester (2015)
Size-Related Improved Diversification

Constant Returns to Scale

Economies of Scale

Diseconomies of Scale

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• decreases 4.132% for 75-95 percentile of banks
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- **decreases 4.132%** for 75-95 percentile of banks
- **decreases 5.138%** for 95-99 percentile of banks
- **decreases 8.018%** for largest 1% of banks
Finding the Elusive Benefits of Size

- Risk-Return Driven Cost Function
  - Joseph Hughes and Loretta Mester (*JFI* 2013)
  - Mark Dijkstra (2013)
  - Estimation of **total cost elasticity** controlling for risk-expected return trade-off

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* Consistent with approximately $14 - $19 billion in cost synergies at $2.4 trillion in consolidated assets.
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• Robustness checks (Hughes and Mester 2013)

• Similar results are obtained
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• Similar results are obtained using 2007 data
  – Dropping institutions smaller than $2 billion in assets
Are the Estimated Scale Economies at the Largest Institutions Credible?

• Robustness checks (Hughes and Mester 2013)

• Similar results are obtained

• Similar results are obtained using 2007 data
  – Dropping institutions smaller than $2 billion in assets
  – Dropping institutions larger than $100 billion in assets
  – too-big-to-fail institutions – and predicting scale economies for these banks out of sample
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• Technology – not too big to fail
Restrictions on the Size of the Largest Financial Institutions and their Global Competitiveness

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• Hughes and Mester (2013)
  – Cost comparison of 17 largest institutions (> $100 billion) scaled back to half their size with same product mix as larger institution; increase number of banks to equal total assets of the 17 largest
  – 23% higher total cost for the smaller banks
Conclusions

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• But there may be social costs of large banks: financial stability considerations.
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- But size restrictions may not be effective since they work against market forces and may create incentives for firms to avoid these restrictions.
- May push risk-taking outside the regulated financial sector, without necessarily reducing systemic risk.