JOSEPH P. HUGHES

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"Ms. Mester . . . is considered a leader in the field of measuring the economies of scale exhibited by large banks, along with her research partner ***Joseph Hughes*** *of* ***Rutgers University****. Their work has found economies of scale at all sizes of banks, and that bigger banks enjoy higher economies of scale – that is, they are able to provide products at lower cost than smaller banks. That is a break from earlier research that did not find economies of scale at big banks. Their work finds that these cost advantages don't just come from lower-cost funding investors are willing to give big banks because they believe the government will bail them out if trouble strikes – the cost advantage big bank critics focus on. In other words, there are good business reasons for banks to be big, according to their research."*

Wall Street Journal**, 2.18.2014**

"It could be that large banks can finance themselves more cheaply

Professional Profile

I am currently a Fellow of the Wharton Financial Institutions Center and have been a Visiting Scholar at the Federal Reserve Bank of Cleveland, the Federal Reserve Bank of Philadelphia, the Federal Reserve Bank of New York, and the Office of the Comptroller of the Currency.

My research has been published in such journals as the *American Economic Review*, the *Journal of Economic Theory*, the *Journal of Money, Credit, and Banking*, and the *Review of Economics and Statistics*, the *Journal of Financial Intermediation*, the *Journal of Banking and Finance*, and the *Journal of Financial Services Research*.

Focusing on incorporating endogenous risk-taking into the analysis of banking production, my research uncovers evidence of large economies of scale across banks of all sizes with the largest economies at the largest financial institutions – a result that suggests proposed restrictions to limit the size of financial institutions, if effective, may put large banks at a competitive disadvantage in global markets where competitors are not similarly constrained. Moreover, size restrictions may not be effective since they work against market forces and create incentives for firms to avoid them. Avoiding the restrictions could thereby push risk-taking outside of the more regulated financial sector without necessarily reducing systemic risk. I have also examined the role of the too-big-to-fail policy in contributing to measured scale economies at the largest financial institutions.

In addition, I have applied stochastic frontier estimation, frequently used in production economics, to measure agency problems and financial performance. Stochastic frontiers can estimate potential market value and the systematic failure to achieve it – market-value inefficiency, which I have applied to financial institutions to evaluate the efficiency of their investment strategies and capital structure.

Education

University of North Carolina at Chapel Hill
Economic Theory, Ph.D., 1974

Davidson College
Economics, A.B., 1970

Université de Montpellier (France)
Economics, 1968-1969

Experience

Fellow of the Wharton Financial Institutions Center

Visiting Scholar, Federal Reserve Bank of Cleveland, 2016
Visiting Scholar, Federal Reserve Bank of Philadelphia, 2011
Visiting Scholar, Federal Reserve Bank of New York, 2002
Visiting Scholar, Federal Reserve Bank of Philadelphia, 1997
Visiting Scholar, Office of the Comptroller of the Currency, 1996

Rutgers University, since 1975
Director of Research, Bureau of Economic Research, Rutgers University, 1982-88

University of Pennsylvania, 1981
North Carolina State University, 1974-75
Davidson College, 1973-74

because they are more efficient, that is, that there are economies of scale in banking. For some time, the received wisdom was that there was no evidence of such economies beyond relatively modest-sized banks, with balance sheets of approximately $100 billion. More recently, several papers have found that economies of scale may continue beyond that level. For example, the title of a paper by Joseph Hughes and Loretta Mester, 'Who Said Large Banks Don't Experience Scale Economies? Evidence from a Risk-Return Driven Cost Function' suggests that large institutions may be better able to manage risk more efficiently because of 'technological advantages, such as diversification and the spreading of information…and other costs that do not increase proportionately with size.' That said, these authors conclude that '[W]e do not know if the benefits of large size outweigh the potential costs in terms of systemic risk that large scale may impose on the financial system.' They add that their results suggest that 'strict size limits to control such costs will likely not be effective, since they

Work in Progress

"How Bad Is a Bad Loan? Distinguishing Inherent Credit Risk from Inefficient Lending (Does the Capital Market Price This Difference?)," with Choon-Geol Moon (Hanyang University)

"Market Discipline Working For and Against Financial Stability: The Two Faces of Equity Capital in U.S. Commercial Banking" with Loretta J. Mester (Federal Reserve Bank of Cleveland) and Choon-Geol Moon (Hanyang University), Department of Economics, Rutgers University, Working Paper 201611

"Capital Regulation: Less Can Be More When Incentives Are Socially Aligned"

"Is Bigger Necessarily Better in Community Banking" with Julapa Jagtiani (Federal Reserve Bank of Philadelphia), and Loretta J. Mester (Federal Reserve Bank of Cleveland), Department of Economics, Rutgers University, Working Paper 201604

"Middle-Tier Banking" (joint research with Simon Kwan at the Federal Reserve Bank of Cleveland)

"The Efficiency of Lending: Lending Club versus Community Banks" (joint research with Julapa Jagtiani at the Federal Reserve Bank of Philadelphia)

Recent Conferences and Presentations

"Market Discipline Working For and Against Financial Stability: The Two Faces of Equity Capital in U.S. Commercial Banking," Conference at the **Federal Reserve Bank of Atlanta** on **Financial Regulation: Fit for the Future**, November 2017, Atlanta.

"Market Discipline Working For and Against Financial Stability: The Two Faces of Equity Capital in U.S. Commercial Banking," Conference on Large Financial Institutions at the **Fall Meetings of the International Atlantic Economic Society**, October 2017, Montreal

"Market Discipline Working For and Against Financial Stability: The Two Faces of Equity Capital in U.S. Commercial Banking," **Conference at the University of Oxford**, **Towards an Integrated View of Financial Regulation: Key Lessons from the Crisis and Future**, International Finance and Banking Society, Oxford, July 2017.

"Capital Regulation: Less Can Be More When Incentives Are Socially Aligned," **Conference on the Future of Large Financial Institutions** at the Fall Meetings of the International Atlantic Economic Society, Washington, DC, October 2016.

"Capital Regulation: Less Can Be More When Incentives Are Socially Aligned," **The Interplay of Financial Regulations, Resilience, and Growth**, **The Wharton School and the Federal Reserve Bank of Philadelphia**, Philadelphia, June 2016.

Panelist, **Ending Too Big to Fail Policy Symposium**, **Federal Reserve Bank of Minneapolis**, Minneapolis, April 2016.

"The Future of Large, Internationally Active Banks: Does Scale Define the Winners?" (coauthored with Loretta J. Mester, Federal Reserve Bank of Cleveland), **International Banking Conference, Federal Reserve Bank of Chicago and the World Bank**, Chicago, November 2015.

"Does Scale Define the Winners in Community Banking?" (coauthored with Julapa Jagtiani, Federal Reserve Bank of Philadelphia, and Loretta Mester, Federal Reserve Bank of Cleveland), **Conference on the Future of Large Financial Institutions** at the Fall Meetings of the **International Atlantic Economic Society**, Boston, October 2015.

"Does Scale Win in Banking?" **Columbia University Business School**, March

work against market forces…' "

Stanley Fischer

Vice Chairman

Federal Reserve Board

Martin Feldstein Lecture

NBER, 7.10.2014

"I have never had a class where the students interacted so much, we taught and learned from each other, and Professor Hughes guided us along the way. I made more friends in this class than any other class I have taken."

Anonymous Student Evaluation

"The course was run like a seminar as a research based course. Through this course I have learned a great deal about a very specific field of economics. As opposed to the traditional way of learning through textbooks we read research papers and discussed them thoroughly in class."

Anonymous Student Evaluation

"I felt as though this course was a Capstone, of sorts, in my Economics major. I learned so much, so much so that I can have actually conversations

2015.

Co-Chair, Organizing the **Conference on the Future of Large Financial Institutions** at the Fall Meetings of the Atlantic Economic Society, October 2014 and 2015, Savannah.

"Who Said Large Banks Don't Experience Scale Economies? Evidence from a Risk-Return-Driven Cost Function" (coauthored with Loretta J. Mester), at the **Conference on Too-Big-To-Fail and Bank Funding Costs sponsored by the Clearing House Association and NYU Stern School**, October 2013.

"Who Said Large Banks Don't Experience Scale Economies? Evidence from a Risk-Return-Driven Cost Function" (coauthored with Loretta J. Mester), at the **Federal Reserve Bank of New York**, April 2013.

"The Elusive Scale Economies of the Largest Banks and their Implications for Global Competitiveness," **Plenary Panel on the Aftermath of the Financial Crisis, International Atlantic Economic Society**, Montreal, October 2012

"The Elusive Scale Economies of the Largest Banks and their Implications for Global Competitiveness," Banking Conference sponsored by the **Federal Reserve Bank of Chicago** and the **European Central Bank**, Chicago, November 2011

"Who Said Large Banks Don't Experience Scale Economies? Evidence from a Risk-Return-Driven Cost Function," with Loretta J. Mester, **Financial Intermediation Research Society**, Sydney, Australia, June 2011.

"Who Said Large Banks Don't Experience Scale Economies? Evidence from a Risk-Return-Driven Cost Function," with Loretta J. Mester, **Allied Social Science Association Meetings**, Denver, CO, January 2011.

"Who Said Large Banks Don't Experience Scale Economies? Evidence from a Risk-Return-Driven Cost Function," with Loretta J. Mester, Plenary Panel, Fall Meetings of the **International Atlantic Economic Society**, Charleston, SC, October 2010.

Publications

"Measuring Agency Costs and the Value of Investment Opportunities of U. S. Bank Holding Companies with Stochastic Frontier Estimation," with Loretta J. Mester (Federal Reserve Bank of Cleveland) and Choon-Geol Moon (Hanyang University)**,** *Research Handbook on Competition in Banking and Finance*, eds. Jacob A. Bikker and Laura Spierdijk, Edward Elgar Publishing, forthcoming.

"The Future of Large, Internationally Active Banks: Does Scale Define the Winners?" with Loretta J. Mester (Federal Reserve Bank of Cleveland), Chapter 6, pp. 77-96, in *The Future of Large, Internationally Active Banks*, Douglas Evanoff, Editor, World Scientific Publishing Co., 2016.

"Measuring the Performance of Banks: Theory, Practice, Evidence, and Some Policy Implications," with Loretta J. Mester, in *The Oxford Handbook of Banking*, second edition, edited by Allen N. Berger, Philip Molyneux, and John Wilson, Oxford University Press, 2015, 247-270.

"Who Said Large Banks Don't Experience Scale Economies? Evidence from a Risk-Return-Driven Cost Function," with Loretta J. Mester, *Journal of Financial Intermediation*, 2013, 22:4, 559-585.

"The Elusive Scale Economies of the Largest Banks and Their Implications for Global Competitiveness," in Douglas Evanoff, Cornelia Holthausen, George Kaufman and Manfred Kremer, editors, *The Role of Central Banks in Financial Stability: How Has It Changed?* World Scientific Publishing Co. Pte. Ltd, New

about the papers we read in class with students who are not interested in Economics, at home with my family and also in job interviews. It was a lot of fun!"

Anonymous Student Evaluation

Jersey, 2013.

"A Primer on Market Discipline and Governance of Financial Institutions for Those in a State of Shocked Disbelief," with Loretta J. Mester, for *Efficiency and Productivity Growth in the Financial Services Industry*, edited by Fotios Pasiouras, pp. 19-47, John Wiley and Sons, 2013.

"A New Cost Efficiency Measure for Not-for-Profit Firms: Evidence of a Link between Inefficiency and Large Endowments," in memory of John Virgo, Editor, *Atlantic Economic Journal*, 2013, 41:3, 279-300.

"The Cost Consequences of Breaking up Large Banks: Do Large Banks Enjoy Technological Cost Advantages?" *Journal of Stock & Forex Trading*, 2013, 3:113. doi: 10.4172/2168-9458.1000113.

"Efficiency in Banking: Theory, Practice, and Evidence," with Loretta J. Mester, Chapter 19 in *The Oxford Handbook of Banking*, edited by Allen N. Berger, Philip Molyneux, and John Wilson, Oxford University Press, December 2009.

"Estimating Managers' Utility-Maximizing Demand for Agency Goods," with Choon-Geol Moon, in *How Do Banks Compete? Strategy, Regulation, and Technology*, Proceedings of the 40th Annual Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago, May 2004, 320-352.

"Do Bankers Sacrifice Value to Build Empires? Managerial Incentives, Industry Consolidation, and Financial Performance," with William Lang Loretta Mester, Choon-Geol Moon, and Michael Pagano, *Journal of Banking and Finance*, 2003, 27, 417-447.

"Are Scale Economies in Banking Elusive or Illusive? Incorporating Capital Structure and Risk into Models of Bank Production," with Loretta J. Mester and Choon-Geol Moon, *Journal of Banking and Finance*, 2001, 25:12, 2169-2208.

"Efficient Risk-Taking and Regulatory Covenant Enforcement in a Deregulated Banking Industry," with Robert DeYoung and Choon-Geol Moon, *Journal of Economics and Business*, 2001, 53: 2-3, 255-282.

"Managerial Incentives and the Efficiency of Capital Structure," with William Lang, Michael Pagano, and Choon-Geol Moon, in *The Financial Safety Net: Costs, Benefits, and Implications for Regulation*, Proceedings of the 37th Annual Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago, May 2001, 385-422.

"Recovering Risky Technologies Using the Almost Ideal Demand System: An Application to U.S. Banking," with William Lang, Loretta Mester, and Choon-Geol Moon, *Journal of Financial Services Research*, 2000,18:1, 5-27.

"Incorporating Risk into the Analysis of Production," Presidential Address, Atlantic Economic Society, *Atlantic Economic Journal*, 1999, 27:1, 1-23.

"Measuring Efficiency When Competitive Prices Aggregate Differences in Product Quality and Risk," proceedings of the Conference on the Microeconomics of Financial Intermediation, University of Venice, January 1998, *Research in Economics/Ricerche Economiche*, 1999, 53, 47-76.

"Measuring the Efficiency of Capital Allocation in Commercial Banking," with William Lang, Michael Pagano, and Choon-Geol Moon, in *Global Financial Crises: Implications for Banking and Regulation*, Proceedings of the 35th Annual Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago, 1999, 407-429.

"Bank Capitalization and Cost: Evidence of Scale Economies in Risk Management and Signaling," with Loretta J. Mester, *Review of Economics and Statistics*, May 1998, 80:2, 314-325.

"Evidence on the Objectives of Bank Regulators," with Robert DeYoung and Choon-Geol Moon, in *Technology: Policy Implications for the Future of Financial Services,* Proceedings of the 33rd Annual Conference on Bank Structure and Competition Federal Reserve Bank of Chicago, 1997, 585-597.

"Efficient Banking Under Interstate Branching," with William Lang, Loretta J. Mester, and Choon-Geol Moon, *Journal of Money, Credit, and Banking*, November 1996 (part 2), 28:4, 1045-1071.

"Safety in Numbers: Geographic Diversification and Bank Insolvency Risk," with William Lang, Loretta J. Mester, and Choon-Geol Moon, in *Rethinking Bank Regulations: What Should Bank Regulators Do?* Proceedings of the 32nd Annual Conference on Bank Structure and Competition Federal Reserve Bank of Chicago, 1996, 202-218.

"Recovering Bank Technologies When Managers Are Not Risk-Neutral," with William Lang, Loretta J. Mester, and Choon-Geol Moon, in *The New Tool Set: Assessing Innovations in Banking*, Proceedings of the 31st Annual Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago, 1995, 349-368.

"Evidence on the Objectives of Bank Managers," with Loretta Mester, in *The Declining Role of Banking*, Proceedings of the 30th Annual Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago, 1994, 496-500.

"A Quality and Risk-Adjusted Cost Function for Banks: Evidence on the 'Too-Big-To-Fail' Doctrine," with Loretta Mester, *Journal of Productivity Analysis*, 1993, Volume 4, pp. 293 - 315.

"Profit-Maximizing Input Demand under Rate-of-Return Regulation: Pathological Substitution and Output Effects," *Resources and Energy*, 1990, Volume 12, pp. 79-95.

"Giffen Inputs and the Theory of Multiple Production," *Journal of Economic Theory*, October 1981, Volume 25:2, pp. 287-301.

"The Comparative-Statics of an Increasing-Cost, Competitive Industry," *American Economic Review*, June 1980, Volume 70:3, pp. 518-21.

"The Supply of Dated Outputs and their Demand for Dated Inputs," *Atlantic Economic Journal*, December 1980, Volume 8:4, pp. 27-31.

"Pathological Substitution Effects in the Multi-Product Firm," *Southern Economic Journal*, January 1980, Volume 46:3, pp. 873-76.

"Factor Demand in the Multi-Product Firm," *Southern Economic Journal*, October 1978, volume 45:2, pp. 494-501.

Teaching Monographs for Undergraduate Courses

An Exercise in Estimating Bank Cost Functions and Scale Economies: US Banks in 2009, completed in 2010 and put into the curriculum in 2010 (Economics 320, Intermediate Microeconomics)

Lessons from a Recent U. S. Banking Crisis (prepared for Byrne Family Seminar Series)

Curbing the Demand for Gasoline by Increasing and Rebating the Federal Gasoline Tax: An Empirical Exercise in Public Policy for Intermediate Microeconomics to Illustrate Substitution and Income Effects for the Demand for Gasoline in the United States from 1984 to 2005, completed and put into the curriculum in 2007, revised 2009 (Economics 320 Intermediate Microeconomics)

Using SAS to Investigate Financial Economics, completed and put into the curriculum in 2013 (Economics 393, Financial Economics)

Using SAS to Investigate Market Discipline, completed and put into the curriculum in 2008 (Economics 408, Market Discipline; Economics 493-494, Honors Research I and II)

Offices and Editorial Boards

Member, Editorial Board of the *Journal of Financial Services Research* since 2007

Member of the Editorial Board of the *Atlantic Economic Journal* since 1980

Member, Program Committee of the Atlantic Economic Society, 1991-current, organizing sessions on enterprise performance and technology measurement and banking

Member, Program Committee, Chicago Financial Institutions Conference, 2015

Member, Program Committee of the Financial Management Association, 2007
Member, Program Committee of the Financial Management Association, 2001
Member, Program Committee of the Financial Management Association, 1999
Member, Program Committee of the Financial Management Association, 1998
Member, Program Committee of the Financial Management Association, 1995

Member, Executive Committee of the Atlantic Economic Society, 1997-2000
Member, Executive Committee of the Atlantic Economic Society, 1985-1988

President, Atlantic Economic Society, 1997-1998
Vice President, Atlantic Economic Society, 1996-97