



INTERNATIONAL JOURNAL OF CENTRAL BANKING

Introduction

Alternative Models of Interest Rate Pass-Through in Normal and Negative Territory

*Mauricio Ulate*

The Rise of Fintech Lending to Small Businesses: Businesses' Perspectives on Borrowing

*Brett Barkley and Mark Schweitzer*

\*\*\*\*\*

Monetary Policy with Negative Interest Rates: De-Linking Cash from Digital Money

*Katrin Assenmacher and Signe Krogstrup*

Modeling the Consumption Response to the CARES Act

*Christopher D. Carroll, Edmund Crawley, Jiri Slacalek, and Matthew N. White*

The First Line of Defense: The Discount Window during the Early Stages of the Financial Crisis

*Elizabeth Klee*

International Inflation Spillovers: The Role of Different Shocks

*Gregor Bäurle, Matthias Gubler, and Diego R. Känzig*

Always Look on the Bright Side? Central Counterparties and Interbank Markets during the Financial Crisis

*Massimiliano Affinito and Matteo Piazza*

Pension Funds' Herding

*Dirk W.G.A. Broeders, Damiaan H.J. Chen, Peter A. Minderhoud, and C.J. Willem Schudel*



Introduction	1
Alternative Models of Interest Rate Pass-Through in Normal and Negative Territory <i>Mauricio Ulate</i>	3
The Rise of Fintech Lending to Small Businesses: Businesses' Perspectives on Borrowing <i>Brett Barkley and Mark Schweitzer</i>	35
* * * * *	
Monetary Policy with Negative Interest Rates: De-Linking Cash from Digital Money <i>Katrin Assenmacher and Signe Krogstrup</i>	67
Modeling the Consumption Response to the CARES Act <i>Christopher D. Carroll, Edmund Crawley, Jiri Slacalek, and Matthew N. White</i>	107
The First Line of Defense: The Discount Window during the Early Stages of the Financial Crisis <i>Elizabeth Klee</i>	143
International Inflation Spillovers: The Role of Different Shocks <i>Gregor Bäurle, Matthias Gubler, and Diego R. Känzig</i>	191
Always Look on the Bright Side? Central Counterparties and Interbank Markets during the Financial Crisis <i>Massimiliano Affinito and Matteo Piazza</i>	231
Pension Funds' Herding <i>Dirk W.G.A. Broeders, Damiaan H.J. Chen, Peter A. Minderhoud, and C.J. Willem Schudel</i>	285

Copyright © 2021 by the Association of the International Journal of Central Banking.  
All rights reserved. Brief excerpts may be reproduced or translated provided the source  
is cited. Consult [www.ijcb.org](http://www.ijcb.org) for further information.

The *International Journal of Central Banking* is published quarterly  
(ISSN: 1815-4654). Online access to the publication is available free of charge  
at [www.ijcb.org](http://www.ijcb.org). Changes to hard copy subscriptions and orders should be placed by  
e-mail at [editor@ijcb.org](mailto:editor@ijcb.org).

Renewals, claims, address changes, and requests for permission to reprint material  
from this journal should be addressed to:

International Journal of Central Banking  
HS08.20  
European Central Bank  
Sonnemannstr. 22  
D-60640 Frankfurt am Main  
Germany  
Phone: +4969134495894  
E-mail: [editor@ijcb.org](mailto:editor@ijcb.org)

The views expressed in this journal do not necessarily represent the views of the  
Association of the International Journal of Central Banking or any of its members.

ISSN: 1815-4654

# International Journal of Central Banking

## Board of Directors

### Chairman

Richard Clarida, *Federal Reserve Board*

### Board Members

Elias Albagli, *Central Bank of Chile*  
Ahmed Alkholifei, *Saudi Arabian Monetary Authority*  
David E. Altig, *Federal Reserve Bank of Atlanta*  
Jan Marc Berk, *The Nederlandsche Bank*  
Claudio Borio, *Bank for International Settlements*  
Jan Bruha, *Czech National Bank*  
Paul Castillo, *Central Reserve Bank of Peru*  
Lillian Cheung, *Hong Kong Monetary Authority*  
Laurent Clerc, *Bank of France*  
Andrew Colquhoun, *Monetary Authority of Singapore*  
Francisco G. Dakila Jr., *Bangko Sentral ng Pilipinas*  
Troy Davig, *Federal Reserve Bank of Kansas City*  
Michael Dotsey, *Federal Reserve Bank of Philadelphia*  
Luci Ellis, *Reserve Bank of Australia*  
Rosthom Fadli, *Bank of Algeria*  
Eugenio Gaiotti, *Banca d'Italia*  
Yong Ha, *Reserve Bank of New Zealand*  
Philipp Hartmann, *European Central Bank*  
Jonathan Heathcote, *Federal Reserve Bank of Minneapolis*  
Beverly Hirtle, *Federal Reserve Bank of New York*  
Elena Iorga, *National Bank of Romania*  
Esa Jokivuolle, *Bank of Finland*  
Signe Krogstrup, *Danmarks Nationalbank*  
Michael Kumhof, *Bank of England*  
Thomas Laubach, *Federal Reserve Board*  
Ana Christina Leal, *Bank of Portugal*  
Carlos Lenz, *Swiss National Bank*  
Ye Liu, *People's Bank of China*  
Ken Matsushita, *Bank of Japan*

Andre Minella, *Central Bank of Brazil*  
Emanuel Mönch, *Deutsche Bundesbank*  
Gerard O'Reilly, *Central Bank of Ireland*  
Eva Ortega, *Bank of Spain*  
Michael D. Patra, *Reserve Bank of India*  
Anna Paulson, *Federal Reserve Bank of Chicago*  
Thórarinn G. Pétursson, *Central Bank of Iceland*  
Sigal Ribon, *Bank of Israel*  
Kasper Roszbach, *Norges Bank*  
Glenn Rudebusch, *Federal Reserve Bank of San Francisco*  
Krislert Samphantharak, *Bank of Thailand*  
Çağrı Sarıkaya, *Central Bank of Turkey*  
Lawrence Schembri, *Bank of Canada*  
Woon Shin, *Bank of Korea*  
Ulf Söderström, *Sveriges Riksbank*  
Ellis Tallman, *Federal Reserve Bank of Cleveland*  
George Tavlas, *Bank of Greece*  
Geoff Tootell, *Federal Reserve Bank of Boston*  
Dobiesław Tymoczko, *National Bank of Poland*  
Hernando Vargas Herrera, *Banco de la República*  
Christopher Waller, *Federal Reserve Bank of St. Louis*  
John Weinberg, *Federal Reserve Bank of Richmond*  
Rafael Wouters, *National Bank of Belgium*  
Mine Yücel, *Federal Reserve Bank of Dallas*  
Ksenia Yudaeva, *Central Bank of Russian Federation*

## Editorial Board

### Managing Editor

Luc Laeven  
European Central Bank

### Co-editors

Klaus Adam  
University of Mannheim  
Tobias Adrian  
International Monetary Fund  
Boragan Aruoba  
University of Maryland  
Huberto Ennis  
Federal Reserve Bank of Richmond

Linda S. Goldberg  
Federal Reserve Bank of New York  
Òscar Jordà  
Federal Reserve Bank of San Francisco  
Sharon Kozicki  
Bank of Canada

Keith Kuester  
University of Bonn  
Elena Loutschina  
UVA Darden School of Business  
Steven Ongena  
University of Zurich

## Associate Editors

Patrick Bolton  
Columbia University  
Michael D. Bordo  
Rutgers University  
Mark Carey  
Federal Reserve Board  
Pierre Collin-Dufresne  
École Polytechnique Fédérale de Lausanne  
Guy Debelle  
Reserve Bank of Australia  
Douglas W. Diamond  
University of Chicago  
Graduate School of Business  
Francis Diebold  
University of Pennsylvania  
Michael Dotsey  
Federal Reserve Bank of Philadelphia

Darrell Duffie  
Stanford University  
Jordi Galí  
Centre de Recerca en Economia Internacional (CREI)  
Marvin Goodfriend  
Carnegie Mellon University  
Michael B. Gordy  
Federal Reserve Board  
Luigi Guiso  
Einaudi Institute  
Andrew G. Haldane  
Bank of England  
Takatoshi Ito  
Columbia University  
David Lando  
Copenhagen Business School  
Philip Lane  
European Central Bank

Francesco Lippi  
LUISS University  
Carmen M. Reinhart  
Harvard Kennedy School  
Hélène Rey  
London Business School  
Jean-Charles Rochet  
University of Zurich  
Andrew K. Rose  
University of California, Berkeley  
Lars E.O. Svensson  
Stockholm School of Economics  
Jürgen von Hagen  
University of Bonn  
Ernst-Ludwig von Thadden  
University of Mannheim  
Tsutomu Watanabe  
University of Tokyo

## Advisory Board

Franklin Allen  
Imperial College London  
Charles Goodhart  
London School of Economics

Hyun Song Shin  
Bank for International Settlements  
John Taylor  
Stanford University

Kazuo Ueda  
University of Tokyo  
Carl E. Walsh  
University of California  
Michael Woodford  
Columbia University

# Introduction

This issue of the *International Journal of Central Banking* includes two of the papers presented at the conference entitled “Structural Changes in the Financial System: New Theory and Evidence” hosted by the European Central Bank on August 20–21, 2020. The conference was co-organized with the European Central Bank and Denmark’s Nationalbank. The two papers, chosen using the same rigorous standards applied to all *International Journal of Central Banking* content, are “Alternative Models of Interest Rate Pass-Through in Normal and Negative Territory” by Mauricio Ulate; and “The Rise of Fintech Lending to Small Businesses: Businesses’ Perspectives on Borrowing” by Brett Barkley and Mark Schweitzer. The program committee for the conference was Tobias Adrian, Elena Carletti, Huberto Ennis, Linda Goldberg, Luc Laeven, and Steven Ongena.