# VOLUME 25, NUMBER 3, APRIL 2021

# MACROECONOMIC DYNAMICS

EDITOR: WILLIAM A. BARNETT



## MACROECONOMIC DYNAMICS

Editor: William A. Barnett, University of Kansas, Department of Economics, 356 Snow Hall, 1460 Jayhawk Boulevard, Lawrence, KS 66045–7523, USA, and The Center for Financial Stability, 1120 Avenue of the Americas, 4th Floor, New York, NY 10036, USA.

**Coeditors:** George Evans (University of Oregon), Roger Farmer (University of Warwick and NIESR), Oded Galor (Brown University and Hebrew University of Jerusalem), Cars Hommes (University of Amsterdam, The Netherlands), Iourii Manovskii (University of Pennsylvania), Lee Ohanian (UCLA), Gilles Saint-Paul (Paris School of Economics, France), Apostolos Serletis (University of Calgary, Canada), Tony Smith (Yale University), Stephen Turnovsky (University of Washington), Francesco Zanetti (University of Oxford, UK)

**Book Review Editors:** Michele Boldrin, Department of Economics, Washington University, One Brookings Drive, St. Louis, MO 63130, and Universidad Carlos III, Madrid; Gregory D. Hess, President's Office, Wabash College, W. Wabash Avenue, Crawfordsville, IN 47933.

**Special Issues Editors:** Stephen Turnovsky, Department of Economics, Box 353330, University of Washington, Seattle, WA 98195; Lee Ohanian, Department of Economics, UCLA, 2261 Bunche Hall, 405 Hilgard Avenue, Los Angeles, CA 90024.

Editorial Information System Manager: Stephen E. Spear, Graduate School of Industrial Administration, Carnegie Mellon University, Pittsburgh, PA 15213.

Local Area Network Manager: Nathan Haley, Lawrence, Kansas.

Editorial Associate: Melinda Barnett, University of Kansas.

#### Advisory Editors:

Jean-Pascal Bénassy (CEPREMAP, Paris), Willem Buiter (London School of Economics and Political Science, London), Francis X. Diebold (University of Pennsylvania), Steven Durlauf (University of Chicago), Douglas Gale (New York University), Giancarlo Gandolfo (Accademia Nazionale dei Lincei, Rome), Roger Guesnerie (DELTA, Paris), Takatoshi Ito (Columbia University), Timothy Kehoe (University of Minnesota), Finn Kydland (Carnegie Mellon University), Lung-Fei Lee (Ohio State University), Adrian Pagan (Sydney University, Australia), Robert Townsend (Massachusetts Institute of Technology), Mark Watson (Princeton University), Kenneth West (University of Wisconsin), Michael Woodford (Columbia University), Randall Wright (University of Wisconsin, Madison)

#### Associate Editors:

Laurence Ales (Carnegie Mellon University), Gaetano Antinolfi (Washington University), Marianna Belloc (Sapienza University of Rome, Italy), Pierpaolo Benigno (LUISS Guido Carli, Rome), Joydeep Bhattacharya (Iowa State University), Volker Böhm (University of Bielefeld, Germany), Benjamin Born (Frankfurt School of Finance & Management, Germany), Hafedh Bouakez (HEC Montreal, Canada), Raouf Boucekkine (Universite Catholique de Louvain, Belgium), Jeffrey Campbell (Federal Reserve Bank of Chicago), Shankha Chakraborty (University of Oregon), Marcelle Chauvet (University of California at Riverside), Christophe Deissenberg (University d'Aix-Marseille II), Juan Dolado (European University Institute, Italy), Huberto Ennis (Federal Reserve Bank of Richmond), Alvaro Escribano (Universidad Carlos III de Madrid, Spain), Emilio Espino (Universidad Torcuato di Tella, Argentina), Luisa Fuster (Universidad Carlos III de Madrid, Spain), Antonio Guarino (University College, London), Thorvaldur Gylfason (University of Iceland), Niels Haldrup (Aarhus University, Denmark), John Hassler (Stockholm University), Moshe Hazan (Tel-Aviv University), Per Hjertstrand (Research Institute of Industrial Economics, Sweden), Kevin Huang (Vanderbilt University), Fredj Jawadi (University of Lille, France), Leo Kaas (Goethe University, Germany), Takashi Kamihigashi (Kobe University, Japan), John Keating (University of Kansas), Todd Keister (Rutgers University), Moritz Kuhn (University of Bonn), Blake LeBaron (Brandeis University), Alfredo Medio (University of Udine, Italy), Qinglai Meng (Oregon State University), Jianjun Miao (Boston University), Kurt Mitman (Stockholm University). Kaushik Mitra (University) of Birmingham, UK), Omer Moav (The Hebrew University of Jerusalem), Cyril Monnet (University of Bern, Switzerland), Patrick Pintus (Université de la Méditerranée & GREQAM, France), Markus Poschke (McGill University, Canada), Julien Prat (CNRS, CREST, France), Francisco Ruge-Murcia (McGill University, Canada), Argia M. Sbordone (Federal Reserve Bank of New York), Eric Sims (University of Notre Dame), Gerhard Sorger (University of Vienna, Austria), Stephen Spear (Carnegie Mellon University), George Tavlas (Bank of Greece), Farshid Vahid (Monash University, Australia), Nicolaas Vriend (Queen Mary, University of London), Ronald Wendner (University of Graz, Austria), Hosny Zoabi (New Economic School, Moscow, Russia)

## MACROECONOMIC DYNAMICS

Volume 25, Number 3, April 2021 Contents

### **ARTICLES**

Introduction to <i>Macroeconomic Dynamics</i> Special Issue on New Tools for Global Analysis of Economic Dynamics	
Luca Gori, Angelo Antoci, Davide Fiaschi, and Mauro Sodini	603
Endogenous Demographic Change, Retirement, and Social Security Giam Pietro Cipriani and Tamara Fioroni	609
Social Capital, Human Capital, and Fertility <b>Raffaella Coppier, Fabio Sabatini, and Mauro Sodini</b>	632
Children's Health, Human Capital Accumulation, and R&D-Based Economic Growth Annarita Baldanzi, Alberto Bucci, and Klaus Prettner	651
	051
Public Debt Management and Tax Evasion Amedeo Argentiero and Roy Cerqueti	669
Globally Indeterminate Growth Paths in the Lucas Model of Endogenous Growth	
Giovanni Bella, Paolo Mattana, and Beatrice Venturi	693
Offshoring, Reshoring, Unemployment, and Wage Dynamics in a Two-Country Evolutionary Model	
Davide Radi, Fabio Lamantia, and Gian Italo Bischi	705
Don't feed the bears! Environmental Defensive Expenditures and Species-Typical Behavior in an Optimal Growth Model Angelo Antoci, Simone Borghesi, and Paolo Russu	733
A Contribution to the Theory of Fertility and Economic Development	
Luca Gori and Mauro Sodini	753
Intergenerational Mobility and Social Status in a Model with Human Capital Investments and Trait Inheritance	
Rainer Andergassen and Franco Nardini	776
Tax Policy and Food Security: A Dynamic Analysis Pawan Gopalakrishnan and Anuradha Saha	795
NOTE A Note on Polonged Pudget Income Taxes and Aggregate (IN)	
A Note on Balanced-Budget Income Taxes and Aggregate (IN) Stability in Multi-Sector Economies	
Nicolas Abad and Alain Venditti	824

SUBSCRIPTION INFORMATION: Macroeconomic Dynamics (ISSN 1365-1005) is published eight times a year in January, March, April, June, July, September, October, and December. Cambridge University Press, One Liberty Plaza, New York, NY 10006, or outside the USA, Canada, and Mexico: Cambridge University Press, University Printing House, Shaftesbury Road, Cambridge CB2 8BS, UK. Claims for missing issues should be made immediately after receipt of the next issue. Periodicals postage at New York, NY and additional mailing offices. Postmaster: send address changes in the USA, Canada, and Mexico to: Macroeconomic Dynamics, Cambridge University Press, One Liberty Plaza, New York, NY 10006, USA. Send address changes elsewhere to: Macroeconomic Dynamics, Journals Dept., Cambridge University Press, University Printing House, Shaftesbury Road, Cambridge CB2 8BS, UK. Annual subscription rates for Volume 25, 2021: Institutional rate is (print and electronic) \$1554.00 in the USA, Canada, and Mexico, £939.00 + VAT elsewhere. Institutional rate (electronic only) \$1134.00 in the USA, Canada, and Mexico, £692.00 + VAT elsewhere. Institutional rate (print only) \$1440.00 in the USA, Canada, and Mexico, £854.00 + VAT elsewhere. Individual rate (print and electronic) \$318.00 in the USA, Canada, and Mexico, £181.00 + VAT elsewhere. Individual rate (print only) \$308.00 in the USA, Canada, and Mexico, £177.00 + VAT elsewhere. Students (print only) \$157.00 in the USA, Canada, and Mexico, £59.00 + VAT elsewhere. For members of the Econometric Society, the Society for the Advancement of Economic Theory, the Society for Nonlinear Dynamics and Econometrics, the Society for Computational Economics, and the Society for the Promotion of Economic Theory the rate is \$123.00 in the USA, Canada, and Mexico, £77.00 + VAT elsewhere. Institutional access is via IP address range(s) or domain name(s); individual subscriber access is via a username and password. Prices include postage; airmail is extra.

© 2021 Cambridge University Press. Photocopying information for users in the USA: The Item-Fee Code for this publication indicates that copying for internal or personal use beyond that permitted by Section 107 or 108 of the US Copyright Law is authorized for users duly registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the appropriate remittance of \$18.00 per article is paid directly to: CCC, 222 Rosewood Drive, Danvers, MA 01923. Specific written permission must be obtained from the publisher for all other copying. The Item-Fee Code for this journal is 1365-1005/20 \$18.00.

ISI Tearsheet Service, 3501 Market Street, Philadelphia, PA 19104, USA is authorized to supply single copies of separate article for private use only. Article reprints are available from the authors. For orders of 50 or more reprints, contact Cambridge University Press.

*Macroeconomic Dynamics* is indexed in EconLit; The Journal of Economic Literature (e-JEL and JEL on CD); ISI: Current Contents/Social & Behavioral Sciences; Social Sciences Citation Index; Research Alert; Mathematical Reviews; MathSciNet; Zentralblatt fur Mathematik.

# **EDITORIAL POLICY**

*Macroeconomic Dynamics* publishes research of the highest theoretical, empirical or quantitative sophistication. Papers of high quality are welcomed from all areas of advanced macroeconomics and allied fields, so long as the research is founded in a rigorous scientific approach. Major advances in macroeconomics without immediate policy applications also are accepted, if they show potential for application in the future. Occasional book reviews, software reviews, announcements, conference proceedings and interviews are published.

An electronic version of the journal is published just prior to the paper version at cambridge.org/mdy. Access to the full-text articles of the electronic version will be limited to institutional subscribers of the hard copy version of the journal, with access available to all online users at that institution's registered domain. Tables of Contents, abstracts, searching and alerting services will remain free of charge. To view the full text of *Macroeconomic Dynamics*, you will need to use the Adobe Acrobat Reader software. If you do not have a copy already, you can get it free of charge. Just follow the link from our Cambridge Core home page, download it, and install it as a plug-in helper application for your browser.