

Wolfgang Keller
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EDUCATION

Ph.D., Economics, Yale University, 1995.

Thesis: *Technological Change: Identification, Theory, and Evidence.*

Diploma, Economics, University of Freiburg, Germany, 1990.

Thesis: *The Slump in Europe.*

FIELDS OF SPECIALIZATION

International technology diffusion; technology transfer and multinational firms; market integration; innovation; global retailing; globalization and inequality; comparative economic history; trade history of China

PROFESSIONAL POSITIONS

2017	Member, Steering Committee, U.S. Census Research Data Centre, Boulder, CO
2016	Special Sworn Employee, U.S. Census Bureau
2016	Faculty Associate, Institute of Behavioral Science, Program on International Development
2015	Research Professor, CESifo, University of Munich, Program on Globalisation
2014	Visiting Professor, CESifo and University of Munich, Fall
2013 - 2014	Visiting Professor, Stanford University, Stanford Institute for Economic Policy Research
2012	Research Fellow, CEPR Program on Economic History
2011 - 2014	Stanford Calderwood Chair, University of Colorado, Boulder
2011	Faculty Associate, Institute of Behavioral Science, Institutions Program
2010 - 2011	Visiting Professor, Princeton University, Economics
2009	Visiting Researcher, CESifo and University of Munich
2008	Special Sworn Employee, U.S. Department of Commerce
2008	Professor, University of Colorado, Boulder, Economics
2005	Associate Professor, University of Colorado, Boulder, Economics
2004	Research Fellow, Globalisation and Economic Policy Centre, Nottingham
2003	Research Associate, NBER Programs on Productivity and International Trade and Investment
2003	Research Fellow, CEPR Program on International Trade
2003	Resident Research Scholar, International Monetary Fund
2003	Associate Professor with tenure, University of Texas, Austin, Economics
2002 - 2003	Visiting Assistant Professor, Brown University
1998	Faculty Research Fellow, NBER Programs on Productivity and International Trade and Investment

- 1998 Assistant Professor, University of Texas, Austin, Economics
1997 Visiting Assistant Professor, University of Toronto, Economics
1995 Assistant Professor, University of Wisconsin, Madison, Economics

HONORS, AWARDS, AND FELLOWSHIPS

- 2014 Humboldt Prize, Alexander von Humboldt Foundation
2013 - 2014 National Fellow, Hoover Institution, Stanford University
2011 - 2012 Peter B. Kenen Fellow, International Economic Section, Princeton University
1992 - 1994 Ph.D. Fellowship, *Studienstiftung des deutschen Volkes*
1991 Aurelio Peccei Prize, International Institute for Applied Systems Analysis, Laxenburg, Austria
1990 German Academic Exchange Service Fellowship
1990 Friedrich A. von Hayek Prize, University of Freiburg
1990 *Studienstiftung des deutschen Volkes* McCloy Fellowship, John F. Kennedy School, Harvard University (declined)

KEYNOTE ADDRESSES AND NAMED LECTURES

- 2017 Economics of Innovation Conference, Geneva (September)
2016 First CCER Summer Institute on International Trade, Yantai, China (June)
2016 Asian Development Bank, Hong Kong (June)
2015 International Economics and Finance Society, Beijing (July)
2014 European Trade Study Group, Munich (September)
2012 Asia Pacific Trade Seminar, Singapore (July)
2009 *Lustrum*, Utrecht School of Economics (November)
2004 Industry Canada, Ottawa (May)

OTHER AFFILIATIONS, ACTIVITIES, AND SERVICE

- 2012 Research Advisor, World Trade Organization, Geneva
2009 External Expert, Industry Canada, Ottawa
2008 Consultant, The World Bank, Washington, D.C.
2008 Research Advisor, European Central Bank, Frankfurt
2005 Organizer, NBER Productivity Program, Spring
2002 - 2008 Associate Editor, Journal of International Economics

RESEARCH GRANTS

- 2014 National Science Foundation, "The Private and Social Return to R&D in the Age of Offshoring" (2014 - 2020; grant SBE-1360207, with Stephen R. Yeaple)
2011 National Science Foundation, "Trading, Institutions, Product Innovation, and Entrepreneurship" (2011 - 2017; grant SES-1124426, with Carol H. Shiue)
2005 The World Bank, "Trade, Multinationals, and Spillovers" (with Beata Javorcik and James R. Tybout)

- 2005 National Science Foundation, "What Explains Modern Economic Growth? New Evidence from a Comparison of China and Europe in the 18th Century" (2005 – 2009; grant SES-0453040, with Carol H. Shiue)
- 1999 National Science Foundation, "How Does Economic Integration Affect Technology Diffusion and the Spatial Distribution of Productivity Growth?" (grant SES-9818902)
- 1996 University of Wisconsin at Madison, "Bilateral Trade and the Gravity Equation"

RESEARCH IMPACT

- 2018 12,329 Google Scholar citations, October.
- 2018 Top 0.7% of all authors in terms of weighted citations, RePEc, March.

GRADUATE TEACHING

- Advanced International Economics (Ph.D., University of Wisconsin, Madison)
- International Trade and Investment (Masters, University of Toronto)
- International Trade (Ph.D., University of Texas, Austin)
- International Trade I (Ph.D., Brown University)
- International Trade II (Ph.D., Brown University)
- International Trade (Ph.D., University of Colorado, Boulder)
- Macroeconomics II (Ph.D., University of Colorado, Boulder)
- International Trade II (Ph.D., University of Colorado, Boulder)
- Graduate lectures on Globalization and Technology Diffusion (World Trade Organization, Shanghai University of Finance and Economics)

UNDERGRADUATE TEACHING

- International Trade and Finance (University of Wisconsin, Madison)
- International Trade and Finance (University of Texas, Austin)
- Principles of Microeconomics (University of Texas, Austin)
- Principles of Microeconomics (University of Colorado, Boulder)
- International Trade (University of Colorado, Boulder)
- Econometrics (University of Colorado, Boulder)
- International Trade (Princeton University)
- Economic Growth (University of Colorado, Boulder)
- Institutions and Economic Outcomes (University of Colorado, Boulder)

REFEREED PUBLICATIONS

"Real International Transactions", chapter for the *Cambridge Economic History of the Modern World*, 2 volumes, edited by Steven Broadberry and Kyoji Fukao, Cambridge University Press, forthcoming (with Carol H. Shiue).

"Foreign Trade and Investment", chapter for the *Cambridge Economic History of China*, 2

- volumes, edited by Debin Ma and Richard von Glahn, Cambridge University Press, forthcoming (with Carol H. Shiue).
- “China’s Domestic Trade During the Treaty Port Era”, Explorations in Economic History (2017) 63 (January): 26-43 (with Javier Andres Santiago and Carol H. Shiue).
- “International Business Travel: An Engine of Innovation?”, Journal of Economic Growth (2015) 20: 75-104 (with Nune Hovhannisyan).
- “Supplier Responses to Wal-Mart’s Invasion of Mexico”, Journal of International Economics (2015) 95, 1: 1-15 (lead article; with Leo Iacovone, Beata Javorcik, and James R. Tybout).
- “Endogenous Formation of Free Trade Agreements: Evidence from the *Zollverein’s* Impact on Market Integration”, Journal of Economic History (2014) 74(4): 1168-1204 (with Carol H. Shiue).
- “Shanghai’s Trade, China’s Growth: Continuity, Recovery, and Change since the Opium War”, IMF Economic Review (2013) 61, 336-378 (with Ben Li and Carol H. Shiue).
- “The Gravity of Knowledge”, American Economic Review (2013) 103(4): 1414-1444 (with Stephen R. Yeaple).
- “China’s Foreign Trade: Perspectives from the Past 150 Years”, The World Economy (2011) 34, 6: 853-892 (with Ben Li and Carol H. Shiue).
- “International Trade, Foreign Direct Investment, and Technology Spillovers”, Chapter 19 in Handbook of the Economics of Innovation, Vol. 2, B. Hall and N. Rosenberg (eds.), Elsevier, North-Holland, 2010, pp. 793 – 829.
- “Technology Transfer Through Imports”, Canadian Journal of Economics (2009) 42, 4: 1411-1448 (with Ram Acharya).
- “Multinational Enterprises, International Trade, and Productivity Growth: Firm-Level Evidence from the United States”, Review of Economics and Statistics (2009) 91,4: 821-831 (with Stephen R. Yeaple).
- “Diffusion of Technology”, New Palgrave Dictionary of Economics, 2nd edition, edited by L. Blume and S. Durlauf, Macmillan, 2008.
- “Openness and Industrial Response in a Wal-Mart World: A Case Study of Mexican Soaps, Detergents and Surfactant Producers”, The World Economy (2008) 31,12: 1558 - 1580 (with Beata Javorcik and James Tybout).
- “Transfer of Technology”, New Palgrave Dictionary of Economics, 2nd edition, edited by L. Blume and S. Durlauf, Macmillan, 2008.

“Markets in China and Europe on the Eve of the Industrial Revolution”, American Economic Review (2007) 97, 4: 1189-1216 (with Carol H. Shiue).

- Reprinted in M. Casson (ed.), Markets and Market Institutions: Their Origin and Evolution, Edward Elgar Publishing Ltd., Cheltenham, UK, 2011.

“The Origins of Spatial Interaction”, Journal of Econometrics (2007) 140, 1: 304-332 (with Carol H. Shiue).

“Market Integration and Economic Development: A Long-Run Comparison”, Review of Development Economics (2007) 11, 1: 103-123 (with Carol H. Shiue).

“International Technology Diffusion”, Journal of Economic Literature (2004) 42, 3: 752-782.

- Reprinted in D. Greenaway, H. Görg, and R. Kneller (eds.), Globalization and Productivity, Edward Elgar Publishing Ltd., Cheltenham, UK, 2008.

“Convergence and Polarization in Global Income Levels: A Review of Recent Results on the Role of International Technology Diffusion”, Research Policy (2003) 32, 6: 1055-1079 (with Guan Gong).

“Pollution Abatement Costs and Foreign Direct Investment Inflows to the U.S. States”, Review of Economics and Statistics (2002) 84, 4: 691-703 (with Arik Levinson).

“On Theories Explaining the Success of the Gravity Equation”, Journal of Political Economy (2002) 110, 2: 281-316 (with Simon J. Evenett).

“Geographic Localization of International Technology Diffusion”, American Economic Review (2002) 92, 1: 120-142.

“Trade and the Transmission of Technology”, Journal of Economic Growth (2002) 7, 1: 5-24 (Lead Article).

“From Socialist Showcase to Mezzogiorno? Lessons on the Role of Technical Change from East Germany’s Post-World War II Growth Performance”, Journal of Development Economics (2000) 63, 2: 485-514.

“Do Trade Patterns and Technology Flows Affect Productivity Growth?”, World Bank Economic Review (2000) 14,1: 17-49.

- Reprinted as “How Trade Patterns and Technology Flows Affect Productivity Growth”, in H. Singer et al. (eds.), New World Order Series, Vol. 20, New Delhi.

“Are International R&D Spillovers Trade-related? Analyzing Spillovers among Randomly Matched Trade Partners”, European Economic Review (1998) 42, 8: 1469-1481.

- Reprinted in D. Greenaway, H. Görg, and R. Kneller (eds.), Globalization and Productivity, Edward Elgar Publishing Ltd., Cheltenham, UK, 2008.

- Selected for summary in Economic Intuition, Winter (1999), pages 7-8, as one of the top 100 papers of the year.

“Technology Flows Between Industries: Identification and Productivity Effects”, Economic Systems Research (1997) 9, 2: 213-220.

“Absorptive Capacity: On the Creation and Acquisition of Technology in Development”, Journal of Development Economics (1996) 49, 1: 199-227.

OTHER PUBLICATIONS

“Joint Ventures and technology transfer: New evidence from China”, VOX 04/15/2018, <https://voxeu.org/article/joint-ventures-and-technology-transfer-china> (with Kun Jiang, Larry Qiu, and William Ridley); [10,671 reads]

“Globalisation and executive compensation”, VOX 06/09/2017, <https://voxeu.org/article/globalisation-and-executive-compensation> (with Will Olney); [21,424 reads]

“Domestic geography matters: China’s internal trade during the treaty port era”, VOX, 08/23/2016, <http://voxeu.org/article/how-domestic-trade-frictions-shape-welfare-gains> (with Javier Andres Santiago and Carol H. Shiue); [6,666 reads]

“Globalization and Polarization in the Wake of Brexit”, VOX, 07/05/2016, <http://voxeu.org/article/globalisation-and-polarisation-wake-brexit>, (with Håle Utar); [22,448 reads]

“The Impact of Regional Trade Agreements: Lessons from the Zollverein”, VOX 12/19/2013, <http://www.voxeu.org/article/do-trade-agreements-increase-trade-evidence-zollverein> (with Carol H. Shiue); [13,552 reads]

“The Evolution of Domestic Trade Flows when Foreign Trade is Liberalized: Evidence from the Chinese Maritime Customs Service”, with Ben Li and Carol H. Shiue, in Institutions and Comparative Economic Development, M. Aoki, T. Kuran, and G. Roland (eds.), Palgrave Macmillan, 2012.

“The Transfer of Knowledge across Countries”, NBER Reporter, No. 1, 2012.

“U.S. International Trade in R&D-Related Services and a Transactions-Based Profile of Business R&D: Discussion”, in International Trade in Services and Intangibles in the Era of Globalization, M. Reinsdorff and M. Slaughter (eds.), University of Chicago Press for the NBER, 2009.

“The Two Faces of Wal-Mart in Mexico”, VOX, 08/20/2011,

<http://www.voxeu.org/article/two-faces-wal-mart-mexico> (with Leo Iacovone, Beata Javorcik, and James Tybout); [25,608 reads]

“China’s Soaring Foreign Trade: Made in Britain, c. 1840?”, *VOX*, 12/19/2010, <http://www.voxeu.org/index.php?q=node/5942> (with Ben Li and Carol H. Shiue); [31,598 reads]

“International business travel and innovation: Face-to-face is crucial”, *VOX*, 04/20/2010, <http://www.voxeu.org/index.php?q=node/4910> (with Nune Hovhannisyan); [24,309 reads]

“The Limits to Offshoring”, *VOX*, 03/17/2009, <http://www.voxeu.org/index.php?q=node/3276> (with Stephen R. Yeaple); [23,472 reads]

WORKING PAPERS AND WORK IN PROGRESS

Globalization and Inequality

“Globalization and Executive Compensation”, July 2018 (with Will Olney); also NBER # 23384.

“International Trade and Job Polarization: Evidence at the Worker Level”, May 2017; also NBER # 22315, CEPR # 13311 (with Håle Utar).

“Globalization, Gender, and the Family”, December 2017 (with Håle Utar).

Innovation, Trade, and Offshoring

“Coagglomeration of Manufacturing and R&D: The Impact of Offshoring on Innovation”, March 2018 (with Teresa Fort, Stephen Yeaple, and Nick Zolas)

“Innovation in the Age of Offshoring”, July 2016 (with Stephen Yeaple and Nikolas Zolas).

“Innovation and Co-location in the United States”, March 2018 (with Teresa Fort, Stephen Yeaple, and Nikolas Zolas).

“The Export-Innovation Nexus under Uncertainty”, July 2016 (with Atanas Hristov and Erdal Yalcin).

“International Joint Ventures and Internal vs. External Technology Transfer: Evidence from China”, March 2018 (with Kun Jiang, Larry Qiu, and William Ridley).

China’s long-run development

“Capital Markets in China and England, 18th and 19th Century: Evidence from Grain Prices”, February 2017; also NBER # 21349, CEPR # 10702 (with Carol H. Shiue and Xin Wang).

“Capital Markets and Colonial Institutions in China”, March 2017 (with Carol H. Shiue).

“Human Capital Acquisition, Famines, and Dynastic Change”, July 2016 (with Matt Butner and Carol H. Shiue).

“Occupational and Geographic Job Mobility in China, 1870 – 1916: Micro-evidence from the Chinese Maritime Customs Service Lists”, July 2016 (with William Ridley and Carol H. Shiue).

Market integration and economic performance

“Capital Markets and Grain Prices: Assessing the Storage Approach”, NBER # 24388, CEPR # 12778, March 2018 (with Carol H. Shiue and Xin Wang).

“Market Integration as a Mechanism of Growth”, October 2016 (with Carol H. Shiue).

OTHER WORKING PAPERS

“The Link Between Fundamentals and Proximate Factors in Development”, March 2014; also NBER # 18808 (with Carol H. Shiue).

“Institutions, Technology, and Trade,” December 2011; also NBER # 13913 (with Carol H. Shiue).

“Innovation Responses to Import Competition”, March 2011 (with Leo Iacovone and Ferdinand Rauch).

“Global Production and Trade in the Knowledge Economy”, NBER # 14626 (with Stephen Yeaple).

“Estimating the Productivity Selection and Technology Spillover Effects from Imports”, NBER Working # 14079 (with Ram Acharya).

“Technology Diffusion and the World Distribution of Income”, January 2002, University of Texas, Austin.

“Knowledge Spillovers at the World’s Technology Frontier”, CEPR Discussion Paper # 2815, 2001.

“Bilateral Trade in a Multilateral World with Imperfect Specialization”, June 1998, University of Wisconsin, Madison.

RECENT PRESENTATIONS, BY PAPER

(including scheduled)

“Coagglomeration of Manufacturing and R&D: The Impact of Offshoring on Innovation”:
Census Data Center, Colorado, October 2018; NYU, March 2018

“Capital Markets and Grain Prices: Assessing the Storage Approach”, CEPR Economic History Symposium, Rome, June 2018

“Globalization and Executive Compensation”: UC Santa Barbara, May 2018, Claremont McKenna, May 2018, Princeton, April 2018, U Hawaii, Feb 2018, Grinnell Jan 2018, Albany-NY, Nov 2017, 2018, NBER ITI Fall 2017, U Nebraska, September 2017, IAB Nuremberg workshop, June 2017, Georgetown, May 2017, CESifo Global Economy Conference, Munich, May 2017, West Coast Trade Workshop (Vancouver), February 2017, University of Colorado, November 2016, Williams, October 2016, RPI, September 2016

“International Joint Ventures and Internal vs. External Technology Transfer: Evidence from China”: AEA, January 2019, Tsinghua-Toronto Conference, Nov 2018, NBER-Tsinghua Conference, September 2018, AIEA-NBER Innovation Conference, Hong Kong, August 2017, UIBE (Beijing), May 2017.

“Globalization, Gender, and the Family”: Oslo, October 2018, Copenhagen, October 2018, Bielefeld, October 2018, IAB/Nuremberg, October 2018, IZA Conference, Columbia University, April 2018, ASSA, Philadelphia, January 2018, ETH Zurich, September 2017, FREIT Conference, Cagliari, September 2017, ETSG (Florence), September 2017, South Western University of Finance and Economics, Chengdu, June 2017, DFG Firm and Labor Market Conference, Berlin, March 2017, Munich, January 2017, Duke, December 2016, UC Berkeley, September 2016, EEA Congress, Geneva, August 2016.

“The Export-Innovation Nexus under Uncertainty”
Delphi Innovation Conference, Munich, July 2016, CESifo Globalization Conference, Munich, May 2016.

“International Trade and Job Polarization: Evidence at the Worker Level”,
Polarization Conference, Paris, July 2018, RIDGE Conference, Montevideo, May 2017, Yale, October 2016, Dartmouth, October 2016, Federal Reserve Board, October 2016, U.S. Census, July 2016, CCER Conference, Yantai, China, June 2016, ZEW Occupations, Skills, and the Labor Market conference, Mannheim, March 2016, Michigan, January 2016, AEA San Francisco, January 2016, NBER ITI, December 2015, EIIT Purdue, October 2015, Linz, October 2015, Warwick, October 2015, LSE, October 2015, UIBE,

Beijing, July 2015, NBER CRIW SI, July 2015, Hitotsubashi Summer Institute, July 2015, CESifo Munich, May 2015.

“Human Capital Acquisition, Famines, and Dynastic Change” Economic History Association Conference, September 2016.

“Capital Markets in China and England in the 18th and 19th centuries: Evidence from Grain Prices”, UC Davis, May 2016; World Economic History Congress, Kyoto, August 2015; NBER Chinese Economy Fall 2015 conference, Cambridge, MA; CEPR/CAGE conference, Venice, Italy, May 2014.

“Foreigners Knocking on the Door: Trade in China During the Treaty Port Era” CEPR Economic History Symposium, Dublin, June 2016; All UC Economic History Conference, Berkeley, October 2015.

“Capital Markets and Colonial Institutions in China” Rutgers, November 2016, UCLA, October 2016; Cornell, October 2016; UC Merced, September 2016, China Economic Summer Institute, Tsinghua University, August 2015; NBER Chinese Economy Spring conference, 2014; Hong Kong Monetary Authority, May 2014; SIEPR Center at Stanford, March 2014; Stanford, November 2013; All UC Economic History Conference, Berkeley, October 2013; CEPR Economic History Symposium, Perugia, 2013

“The Link between Fundamentals and Proximate Factors in Development” Kiel, December 2014; Munich, November 2014; Nottingham, November 2015, Mannheim, October 2014; Hong Kong Science and Technology Trade Conference; Wisconsin, March 2014; UCSD, March 2014; UCLA, March 2014; UC Irvine, November 2013; CURE Conference, London, October 2013; University of Oregon, May 2013

INVITED PRESENTATIONS SINCE 2015

2018 Oslo, IAB Nuremberg, Kentucky, Copenhagen, Tsinghua-NBER Conference, Beijing, Princeton, IZA Conference (Columbia University), SUFE Macro (Shanghai), CEPR Economic History Symposium, Rome, , Jinan University (Guangzhou), UIBE (Beijing), SUFE Trade (Shanghai), Hitotsubashi Summer Institute, RIETI (Tokyo), Hokkaido University

2017 NBER International Trade and Investment Fall meeting, Nebraska, ETH Zurich, Geneva Graduate Institute Innovation Conference, SWUFE (Chengdu), Georgetown

2016 Duke Trade Conference, Yale, Dartmouth, Cornell, Federal Reserve Board, University of Maryland, UC Merced, UC Berkeley, U.S. Census Bureau, CCEP Summer Institute (Yantai), CEPR Economic History Symposium, Hong Kong University, AEA San Francisco.

2015 NBER International Trade and Investment Fall meeting, LSE, All UC Economic History,

NBER China Fall Conference, EIIT Purdue, Warwick, Hitotsubashi Summer Institute, UIBE Beijing, CESifo Global Economy, Munich.

RECENT GRADUATE STUDENT ADVISING

Jacob Howard (ongoing)

Li Yao (ongoing)

Javier Andres Santiago (ongoing)

William Ridley (ongoing)

Carolina Pan (Brandeis; 2017)

Inga Heiland (University of Munich; 2016, University of Oslo Post-Doc)

Xin Wang (2016, Peking University)

Yibei Liu (2015, Yale-National University of Singapore)

Yiqing Xie (2014, Fudan University)

Other graduate students:

Stephen R. Yeaple (U Wisconsin; Penn State University), Chad Bown (U Wisconsin; Peterson Institute), Phil McCalman (U Wisconsin; Australia National University), Josh Ederington (U Wisconsin; University of Kentucky), Bulent Unel (Brown U; Louisiana State University), Ben Li (U Colorado; Boston College), Will Olney (U Colorado; Williams College)

REFEREEING

Journals

American Economic Review, Econometrica, Economic Journal, European Economic Review, International Economic Review, Journal of Development Economics, Journal of Economic History, Journal of European Economic Association, Journal of Industrial Economics, Journal of International Economics, Journal of Political Economy, Quarterly Journal of Economics, Review of Economic Studies, Review of Economics and Statistics, Review of International Economics, and other journals.

Science Foundations

United States of America, Canada, England, Germany, Netherlands, Hong Kong, Israel