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Federal Reserve Bank of Philadelphia  
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09/14/17

## **EDUCATIONAL BACKGROUND**

Ph.D., University of Pittsburgh (1976) Economics  
M.A., University of Pittsburgh (1975) Economics  
B.A., University of Pittsburgh (1972) Economics, Philosophy

Fields of Specialization

Urban/Regional Economics  
Econometrics  
Macroeconomics

## **HONORS AND SPECIAL RECOGNITIONS:**

Fellow of Regional Science Association International, Elected 2010

Senior Fellow, The Rimini Center for Economic Analysis

## **PROFESSIONAL EXPERIENCE**

**Current Position:** Senior Economic Advisor and Economist  
Federal Reserve Bank of Philadelphia

**Affiliations:** Fellow, Regional Science Association International  
Senior Fellow, Rimini Centre for Economic Analysis

**Associate Editor:** Journal of Regional Science, Appointed June 1994  
Regional Science and Urban Economics, Appointed November 2010.  
Journal of Urban Economics, 2012

### **Previous Positions:**

January 1999 - December 2004  
Adjunct Professor  
Real Estate Department  
Wharton School

University of Pennsylvania  
September 1993 - December 1993  
Adjunct Instructor  
Department of Economics  
Temple University

July 1991 - July 1993  
January 1994 – December 1997  
Adjunct Associate Professor  
Real Estate Center  
Department of Finance  
Wharton School  
University of Pennsylvania.

June 1992 - January 2003  
Economic Advisor - Federal Reserve Bank of Philadelphia

January 1984 - June 1992  
Senior Economist and Research Advisor - Federal Reserve  
Bank of Philadelphia

January 1981 - December 1983  
Senior Economist-Federal Reserve Bank of Philadelphia

September 1981 - May 1991  
Lecturer in Finance  
Wharton School  
University of Pennsylvania

August 1978 - December 1980  
Assistant Professor, Department of Economics and Fellow, Center for  
Metropolitan Studies, University of Missouri- St Louis.

September 1977 - August 1978  
Assistant Professor, Department of Economics  
University of Missouri - Kansas City

September 1976 - 1977  
Assistant Professor, Department of Economics, Florida  
International University, Miami, Florida

September 1972 - 1976  
Teaching Fellowship, Department of Economics  
University of Pittsburgh

**Courses Taught:**

Principles of Economics - Macro  
Intermediate Macroeconomics  
Urban Economics

Econometrics (Graduate Level)  
Intermediate Macroeconomics (MBA Program)  
Intermediate Microeconomic (MBA Program)  
Urban Real Estate Economics (Undergraduate and MBA Programs)  
Urban Economics (Ph.D. Level)

## RESEARCH AND SCHOLARLY ACTIVITY

### Publications

**Books:** *Economies of Scale in Manufacturing Location: Theory and Measurements*, Leiden, The Netherlands: Martinus Nijhoff, 1978.

### Articles:

"Increasing Returns to Scale in Metropolitan Manufacturing," *Journal of Regional Sciences*, Vol. 19, No. 3, 1979, pp. 363-373.

"Contrasts in Agglomeration: New York and Pittsburgh: Reconsidered," *Urban Studies*, Vol. 17, 1980, pp. 343-51.

"Interest Rate Effects and Intertemporal Consumption," *Journal of Monetary Economics*, Vol. 9, No. 2, 1982, pp. 223-234.

"Manufacturing Agglomeration Economies as Returns to Scale: A Production Function Approach," *Papers, Regional Science Association*, Vol. 50, 1982, pp. 96-108.

"Do Metropolitan Areas Matter?" *Modeling and Simulation*, Vol. 15, No. 1, 1984, pp. 247-252, with Edwin S. Mills.

"Declining City Productivity and the Growth of Rural Regions: A Test of Alternative Explanations," *Journal of Urban Economics*, Vol. 18, No. 1, 1985, pp. 11-27.

"Is There a Role for Public Policy in Regional Economic Growth?" *Modeling and Simulation*, Vol. 16, No. 1, 1985, pp. 251-259, with Edwin S. Mills.

"The Determinants of County Growth," *Journal of Regional Science*, Vol. 27, No. 1, 1987, pp. 39-54, with Edwin S. Mills; reprinted in David A. Plane, Lawrence D. Mann, Kenneth Button and Peter Nijkamp (editors) *Regional Planning, Classics in Planning*, vol.4, Northampton, MA: Edward Elgar Publishing, 2007.

"Comparisons of Agglomeration or What Chinitz Really Said: Reply,"

*Urban Studies*, Vol. 24, 1987, pp. 75-76.

"Interregional Flows of Funds as a Measure of Economic Integration, in the United States," *Journal of Urban Economics*, vol. 26, No. 1, July 1989, pp. 20-29, with Richard Lang.

"Regional Impacts of Exchange Rate Movements," *Regional Science Perspectives*, Vol. 20, No. 1, 1990, pp. 89-102, with Brian Cody and Richard Voith.

"Urban Agglomeration Economies in the Presence of Technical Change," *Journal of Urban Economics*, vol. 29, No. 1, January 1991, pp. 82-95, with Paul S. Calem.

"The Concentration/conduct Relationship in Bank Deposit Markets," *The Review of Economics and Statistics*, Vol. 73, No. 2, May 1991, pp. 268-276, with Paul Calem.

"Accounting for Differences in Aggregate State Productivity," *Regional Science and Urban Economics*, vol. 22, No. 4, December 1992, pp. 597-617, with Richard Voith).

"Are Regional Incomes Converging? A Time Series Analysis," *Journal of Monetary Economics* Vol. 32, 1993, pp. 335-346, with Leonard Mills.

"The Effects of Exchange Rate and Relative Productivity Changes on U.S. Output at the State Level," *Urban Studies*, Vol. 31, No. 2, March 1994, pp. 219-232, with Brian Cody and Richard Voith.

"Regional Income Dynamics," *Journal of Urban Economics*, Vol. 37, No. 1, January 1995, pp. 88-106, with Robert DeFina.

"Testing Neoclassical Convergence in Regional Incomes and Earnings," *Regional Science and Urban Economics* Vol. 26, No. 6, December 1996, pp. 565-90, with Leonard Mills.

"Convergence and the U.S. States: A Time Series Analysis," *Journal of Regional Science* Vol. 36, No. 4, 1996, pp. 597-616, with Leonard Mills.

"Are Regional Incomes Converging? Some Further Evidence: Reply" *Journal of Monetary Economics* Vol. 32, No. 3, December 1996, pp. 599-602, with Leonard Mills.

"The Differential Regional Effects of Monetary Policy: Evidence from the U.S. States," *The Review of Economics and Statistics*, Vol. 80, No. 4, November 1998, pp.572-587, with Robert DeFina.

"The Differential Effects of Monetary: Evidence from the U.S. States,"

*Journal of Regional Science*, Vol. 39, No. 2, May 1999, pp. 339-358, with Robert DeFina.

"Regional Income Fluctuations: Common Trends and Common Cycles," *The Review of Economics and Statistics*, Vol. 83, No. 3, August 2001, pp. 446-56, with Keith Sill.

"Aggregate Employment Growth and the Deconcentration of Metropolitan Employment," *Journal of Monetary Economics*, Vol. 48, No. 3, December 2001, pp. 549-83, with Satyajit Chatterjee.

"Sectoral Shocks and Metropolitan Employment Growth," *Journal of Urban Economics*, Vol. 50, 2001, pp. 396-417, with Robert DeFina and Keith Sill.

"Employment Deconcentration: A New Perspective on America's Postwar Urban Evolution," *Journal of Regional Science*, Vol. 42, No. 3, August 2002, pp. 455-75, with Satyajit Chatterjee.

"How Strong is Co-Movement in Employment Over the Business Cycle? Evidence from State/Sector Data," *Journal of Urban Economics*, Vol. 55, 2004, pp. 298-315, with Robert DeFina.

"Compensating Differentials and the Social Benefits of the NFL," *Journal of Urban Economics*, Vol. 56, 2004, pp. 25-50, with N. Ed Coulson

"Compensating Differentials and the Social Benefits of the NFL: Reply," *Journal of Urban Economics*, Vol. 60, 2006, pp. 132-138, with N. Ed Coulson

"Urban Density and the Rate of Innovation," *Journal of Urban Economics*, Vol. 61, 2007, pp. 389-419, with Robert Hunt and Satyajit Chatterjee.. Reprinted in Philip McCann (editor) *New Developments in Spatial Economics and Economic Geography*, Northampton, MA: Edward Elgar Publishing Limited, 2013.

"The Long and Large Decline in State Employment Growth Volatility," *Journal of Money Credit and Banking*, Vol. 45, 2013, pp. 521-534, with Robert DeFina and Keith Sill.

"Local Deficits and Local Jobs: Can U.S. States Stabilize Their Own Economies" *Journal of Monetary Economics* Vol. 60:5, July 2013, pp. 517-530, with Robert Inman.

"Fiscal Stimulus in Economic Unions: What Role for States," *Tax Policy and the Economy*, Vol. 30, 2016, pp. 1-50, with Robert Inman.

“The Agglomeration of R&D Labs,” with Kristy Buzard, Jake Carr, Bob Hunt and Tony Smith, *Journal of Urban Economics*, Vol. 101 2017, pp. 14-26.

### **Book Chapters:**

“Dynamics of County Growth,” in, Ake Anderson, David Batten, Borje Johansson, and Peter Nijkamp (eds.), *Advances in Spatial Theory and Dynamics*, Studies in Regional and Urban Economics, No. 20, New York: Elsevier/North-Holland, 1989, with Edwin S. Mills.

"Monetary Policy and the U.S. States and Regions: Some Implications for European Monetary Union," in J. Von Hagen and C. Waller (eds.) *Regional Aspects of Monetary Policy in Europe*, Kluwer Academic Publishers, 2000.

"Macroeconomic Analysis Using Regional Data: An Application to Monetary Policy," in Richard Arnott and Daniel McMillen (eds.) *A Companion to Urban Economics*, Oxford: Blackwell-Synergy, 2007, pp. 440-459, with Robert DeFina.

“What Explains the Quantity and Quality of Local Inventive Activity?” Brookings-Wharton, *Papers on Urban Affairs* (2009) pp.65-124, with Robert Hunt.

“The Geography of Research and Development Activity in the U.S.” In *Handbook of Economic Geography and Industry Studies*,” Frank Giarratani, Geoff Hewings, and Philip McCann, eds. Cheltenham: Edward Elgar Publishing (2013) with Kristy Buzard.

“Agglomeration and Innovation” in *Handbook of Regional and Urban Economics*, Vols. 5A, G. Duranton, V.J. Henderson, and W. Strange (eds.), Elsevier Science B.V, (2015) with William Kerr.

### **Other Publications:**

"From Centralization to Deconcentration: Economic Activity Spreads Out", *Business Review*, Federal Reserve Bank of Philadelphia, May/June 1982.

"New Employment Growth Trends: The U.S. and the Third District," *Business Review*, Federal Reserve Bank of Philadelphia, September/October 1983; Excerpted in *Penn Forum*, Vol. 1, No. 4, November 1983.

"Do Public Policies Affect Country Growth?" *Business Review*, Federal Reserve Bank of Philadelphia, July/August 1985, with Edwin S. Mills.

"Do Regional Wages Differ?" *Business Review*, Federal Reserve Bank of Philadelphia, July/August 1986, pp. 17-25.

"Productivity in Cities: Does City Size Matter," *Business Review*, Federal Reserve Bank of Philadelphia, November/December 1987, pp. 3-12.

"What Can Output Measures Tell Us About Deindustrialization in the National and its Regions?" *Business Review*, Federal Reserve Bank of Philadelphia, January/February 1989, pp. 17-25; reprinted in Rubin E. Slesinger and Robert Sinclair (editors) *Readings in Current Economics*, Redding, California: CAT Publishing Co., 1990.

"Should States Fear the Effects of a Changing Dollar?" *Business Review*, Federal Reserve Bank of Philadelphia, September/October 1990, pp. 3-12.

"Are Regional Per Capita Earnings Diverging?" *Business Review*, Federal Reserve Bank of Philadelphia, March/April 1992, pp. 3-12.

"Highways and Education: The Road to Productivity?" *Business Review*, Federal Reserve Bank of Philadelphia, September/October 1993.

"Do Education and Training Lead to Faster Growth in Cities?" *Business Review*, Federal Reserve Bank of Philadelphia, January/February 1995, pp 15-22.

"Does Monetary Policy Have Differential Regional Effect?" *Business Review*, Federal Reserve Bank of Philadelphia, March/April 1996, pp 17-27, with Robert DeFina.

"Regional Economies: Separating Trends from Cycles" *Business Review*, Federal Reserve Bank of Philadelphia, May/June 1997, pp 19-31, with Keith Sill.

"Trends in Metropolitan Employment Growth," *Business Review*, Federal Reserve Bank of Philadelphia, July/August 1998, pp 19-31.

"Do States Respond Differently to Changes in Monetary Policy Effect?" *Business Review*, Federal Reserve Bank of Philadelphia, July/August 1999, pp 17-27, with Robert DeFina.

"From Centralization to Deconcentration: People and Jobs Spread Out" *Business Review*, Federal Reserve Bank of Philadelphia, November/December 2000, pp 15-27.

"Knowledge Spillovers: Cities' Role in the New Economy," *Business Review*, Federal Reserve Bank of Philadelphia, First Quarter 2001, pp. 17- 26.

"A Confluence of Events? Explaining Fluctuations in Local Employment" *Business Review*, Federal Reserve Bank of Philadelphia, First Quarter 2003, pp. 6-12.

"Should Cities Be Ready for Some Football? Assessing the Social Benefits of Hosting an NFL Team," *Business Review*, Federal Reserve Bank of Philadelphia, Second Quarter 2004, pp. 7-17, with Ed Coulson.

"The Economic Role of Cities in the 21<sup>st</sup> Century," Federal Reserve Bank of Philadelphia *Business Review* (Third Quarter 2005). pp. 9-15.

"The Great Moderation in Economic Volatility: A View from the States," Federal Reserve Bank of Philadelphia *Business Review* (First Quarter 2007), pp. 11-19.

"The Geography of Research and Development Activity in the U.S." (with Kristy Buzard) Federal Reserve Bank of Philadelphia *Business Review* (Third Quarter 2008). pp. 1-11.

"Three Keys to the City: Resources, Agglomeration Economies, and Sorting," Federal Reserve Bank of Philadelphia, *Business Review* (Third Quarter 2011).

"Clusters of Knowledge: R&D Proximity and the Spillover Effect," Federal Reserve Bank of Philadelphia, *Business Review* (Third Quarter 2013), with Jake K. Carr.

"New Ideas in the Air: Cities and Economic Growth" Federal Reserve Bank of Philadelphia, *Business Review* (Fourth Quarter 2014).

"Did the Fiscal Stimulus Work?" *Economic Insights*, First Quarter 2017 Vol. 2, Issue 1 pp. 6-16.

### **Current Research**

"Localized Knowledge Spillovers: Evidence from the Spatial Clustering of R&D Labs and Patent Citations," (with Kristy Buzard, Jake Carr, Bob Hunt and Tony Smith), Working Paper No. 17-32, Department of Research, Federal Reserve Bank of Philadelphia.

"The Role of Startups for Local Labor markets." (With Thorsten Drautzburg). Working Paper No. 17-31, Department of Research, Federal Reserve Bank of Philadelphia.



“Do Non-Compete Covenants Influence State Startup Activity?  
Evidence from the Michigan Experiment,” Working Paper No. 17-30,  
Department of Research, Federal Reserve Bank of Philadelphia.

“Beautiful City,” (with Albert Saiz), Working Paper No. 08-22,  
Department of Research, Federal Reserve Bank of Philadelphia.