

## Daniel E. Sichel

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### Education

Ph.D., Economics, Princeton University, 1988.

M.P.P., Public Policy, University of Michigan, 1983.

B.A., Economics, University of Michigan, 1983.

### Professional Experience

#### **Federal Reserve Board, Division of Research and Statistics, Senior Associate Director, 2011-present. (Other positions 1996-2010)**

- Analytic support to Chairman, Board members, and FOMC.
  - Senior manager in division with staff of more than 300.
  - Oversight responsibility for macroeconomic and fiscal issues.
- Active research program (RePEc score in top 5%).
  - Supervised FEDS working paper series, 2004-09.
  - Member of Executive Committee of the Conference on Research in Income and Wealth (CRIW). The CRIW is administered by the NBER and brings together academics and practitioners working on economic measurement.
  - Co-coordinated Academic Consultants' Meetings for Board of Governors on Health Care (October 2007) and Productivity (October 2009).
  - Co-organized NBER/CRIW conference "Measuring Capital in the New Economy," (April 2002).
- Assistant to Chairman of the Airline Transportation Stabilization Board, 2001-2007.

#### **U.S. Treasury Department, Deputy Assistant Secretary for Macro Analysis, 1995-96.**

- Provided analytic support to Secretary Rubin and Deputy Secretary Summers.

#### **Brookings Institution, Research Associate, 1993-95.**

- Research on information technology and economic growth
- Assistant editor of *Brookings Papers on Economic Activity*.

#### **Federal Reserve Board, Economist, 1988-93.**

## Books

*Measuring Capital in the New Economy*, edited with Carol Corrado and John Haltiwanger, University of Chicago Press and the NBER, 2005.

*The Computer Revolution: An Economic Perspective*, Brookings, 1997, 152 pp.

## Published Articles

“Intangible Capital and Economic Growth,” (with Carol Corrado and Charles Hulten), *Review of Income and Wealth*, Series 55, No. 3, September 2009.

“Shifting Trends in Semiconductor Prices and the Pace of Technological Progress,” (with Ana Aizcorbe and Stephen Oliner), *Business Economics*, July 2008.

“Explaining a Productive Decade,” (with Stephen Oliner and Kevin Stiroh), *Brookings Papers on Economic Activity*, 2007:1. Reprinted in *Journal of Policy Modeling*.

“Can Financial Innovation Help to Explain the Reduced Volatility of Economic Activity,” (with Karen Dynan and Douglas Elmendorf), *Journal of Monetary Economics*, January 2006.

“Measuring Capital and Technology: An Expanded Framework,” (with Carol Corrado and Charles Hulten), in *Measuring Capital in the New Economy*, edited by Carol Corrado, John Haltiwanger, and Daniel Sichel, NBER and University of Chicago press, 2005.

“How Fast do Personal Computers Depreciate? Concepts and New Estimates,” (with Mark Doms, Wendy Dunn, and Stephen Oliner), in *Tax Policy and the Economy*, edited by James Poterba, NBER, 2004.

“Information Technology and Productivity: Where Are We Now and Where Are We Going?” (with Stephen Oliner), Federal Reserve Bank of Atlanta *Economic Review*, vol. 87, Summer 2002.

“The Resurgence of Growth in the Late 1990s: Is Information Technology the Story?” (with Stephen Oliner), *The Journal of Economic Perspectives*, Fall 2000.

“Computers and Aggregate Growth: An Update,” *Business Economics*, April 1999.

“The Productivity Slowdown: Is Mismeasurement the Culprit?” *Review of Economics and Statistics*, August 1997.

“The Lucas Critique Revisited: Assessing the Stability of Empirical Euler Equations for Investment,” (with Stephen Oliner and Glenn Rudebusch), *Journal of Econometrics*, January 1996.

"Is the Shift Toward Employment in Services Stabilizing?" (with D. Lebow), *Service Quality and Productivity: Research, Policy, and Management Challenges*, edited by P. Harker, Fishman-Davidson Center for the Study of the Service Sector and Kluwer Publishers, 1995.

"New and Old Models of Business Investment: A Comparison of Forecasting Performance," (with Stephen Oliner and Glenn Rudebusch), *Journal of Money, Credit, and Banking*, August 1995.

"Computers and Output Growth Revisited: How Big is the Puzzle?" (with Stephen Oliner). *Brookings Papers on Economic Activity*, 1994.

"Inventories and the Three Phases of the Business Cycle," *Journal of Business and Economic Statistics*, July 1994.

"Business Cycle Asymmetry: A Deeper Look," *Economic Inquiry*, April 1993.

"Further Evidence on Business Cycle Duration Dependence," (with Francis Diebold and Glenn Rudebusch), in *New Research on Business Cycles, Indicators, and Forecasting*, edited by James Stock and Mark Watson, NBER and University of Chicago, 1993.

"Cyclical Patterns in the Variance of Economic Activity," (with Mark French), *Journal of Economic and Business Statistics*, January 1993.

"Business Cycle Duration Dependence: A Parametric Approach," *Review of Economics and Statistics*, May 1991.

"The Demand for Money," (with Stephen Goldfeld), in *Handbook of Monetary Economics*, edited by Benjamin Friedman and Frank Hahn, North-Holland, 1990.

"Are Business Cycles Asymmetric: A Correction," *Journal of Political Economy* 97, 1989.

"Money Demand: The Effects of Inflation and Alternative Adjustment Mechanisms," (with Stephen Goldfeld), *Review of Economics and Statistics*, 1987.

"On the Mis-use of Forecast Errors to Distinguish Between Level and First Difference Specifications," (with Stephen Goldfeld), *Economics Letters* 23, 1987.

## **Published Comments and Reviews**

"Intangible Capital," entry for the *New Palgrave Dictionary of Economics*, 2007.

"Accounting for Growth from A to Z: Review Article on *Information Technology and the American Growth Resurgence* by Dale Jorgenson, Mun Ho, and Kevin Stiroh, review in *International Productivity Monitor*, Number 12, Spring 2006.

Comment on “Where Did the Productivity Growth Go? Inflation Dynamics and the Distribution of Income,” by Ian Dew-Becker and Robert Gordon, *Brookings Papers on Economic Activity*, vol. 2 (2005).

Comment on “What Happened to the Great U.S. Job Machine? The Role of Trade and Offshoring,” by Martin Baily and Robert Lawrence, *Brookings Papers on Economic Activity*, vol. 2 (2004).

Comment on “Exploding Productivity Growth: Context, Causes, and Implications,” by Robert Gordon, *Brookings Papers on Economic Activity*, vol. 2 (2003).

"Comment on 'Productivity Growth and the New Economy' by William Nordhaus," *Brookings Papers on Economic Activity*, vol. 2 (2002).

Comment on "Raising the Speed Limit: U.S. Economic Growth in the Information Age," by Dale Jorgenson and Kevin Stiroh, *Brookings Papers on Economic Activity*, 2000:1.

Comment on "Nonlinear Models of Economic Fluctuations," by Simon Potter, *Macroeconometrics: Developments, Tensions and Prospects*, ed. by Kevin Hoover, Kluwer, 1996.

Comment on "Tax Incentives and Equipment Investment," by Peter Clark, *Brookings Papers on Economic Activity*, 1993.

### **Conference Presentations, Seminars, and Discussions (selected)**

NBER Productivity Program (December 2010). Discussed paper on the distribution of the size of price changes by Cavallo and Rigobon.

NBER/CRIW conference (November 2010). Discussed two papers on measuring the financial sector and gauging the impact of the financial crisis on the macroeconomy.

NBER Summer Institute (July 2010), Conference on Research in Income and Wealth. Discussed paper on measuring R&D by Corrado and Haskel.

Statistics Canada (February 2009). Gave two talks in Experts' Seminar Series: “Intangible Capital and Economic Growth” (paper with Corrado and Hulten) and “The Evolution of Household Income Volatility” (paper with Dynan and Elmendorf).

San Francisco Federal Reserve Conference (November 2008). Co-presented update of “Explaining a Productive Decade,” (paper with Oliner and Stiroh).

NBER Summer Institute (July 2008), Conference on Research in Income and Wealth. Discussed two papers: broadband's impact on GDP by Greenstein and McDevitt and welfare gain from personal computers by Greenwood and Kopecky.

ASSA Meetings (January 2008). Discussed paper on semiconductors by Pillai.

NBER Productivity Program (March 2007). Presented “Explaining a Productive Decade” (paper with Oliner and Stiroh).

ASSA Meetings (January 2007). Co-organized session on Financial Innovation and the Great Moderation.

TEKES (Finnish funding agency for Technology and Innovation), Helsinki, Finland (December 2006). Gave two talks on productivity and intangibles.

San Francisco Federal Reserve Conference (November 2006). Co-presented talk on Financial Innovation and the Great Moderation (with Dynan and Elmendorf).

NBER Summer Institute (July 2006). Co-presented “Shifting Trends in Semiconductor Prices and the Pace of Technological Progress” (with Aizcorbe and Oliner).

NBER/CRIW (April 2006). Discussed paper on international technology spillovers by McNeil.

“NBER Summer Institute (July 2005), Conference on Research in Income and Wealth. Discussed paper on role of ICT in Australia’s economic growth by Diewert and Lawrence.

Carnegie-Rochester Policy Conference (April 2005). Co-presented “Can Financial Innovation Help to Explain the Reduced Volatility of Economic Activity” (with Dynan and Elmendorf).

ASSA Meetings (January 2005). Co-presented “Shifting Trends in Semiconductor Prices and the Pace of Technological Progress” (with Aizcorbe and Oliner).

ASSA Meetings (January 2004). Discussed Flamm paper on semiconductor prices.

NBER Summer Institute (July 2004), Conference on Research in Income and Wealth. Co-presented “The Contribution of Intangible Investments to Economic Growth: A Sources of Growth Analysis” (with Corrado and Hulten).

NBER Summer Institute (July 2004), Conference on Research in Income and Wealth. Discussed paper by Meyer and Harper on Bureau of Labor Statistics estimates of multifactor productivity.

NBER Tax Policy and the Economy Conference (November 2003). Co-presented “How Fast Do Personal Computers Depreciate?” (with Doms, Dunn, and Oliner).

NBER/CRIW conference on Hard-to-Measure Goods and Services (September 2003). Discussed two paper: Geske, Ramey, and Shapiro on depreciation of PCs and Harper on technology and vintage aggregation.

NBER Summer Institute (July 2003). Co-presented “Trends in Semiconductor Prices: Breaks and Explanations,” (with Aizcorbe and Oliner). Also discussed paper by Teague and To on hedonic regressions and the CPI.

NBER Summer Institute (July 2001), Conference on Research in Income and Wealth. Discussed Triplett and Moch paper on hedonic price indexes for computers.

## **Guest Class Lectures**

Carnegie-Mellon (2006 and 2007). In fall term each year taught an individual class to MBAs on information technology and productivity growth.

United States Naval Academy (2001, 2002, and 2003). Over three terms taught individual classes to undergraduates on Keynesian economics and the role of government in the economy; the Federal Reserve, monetary policy, and economic growth; and information technology and economic growth.

National Defense University (2000-05). In each fall term taught an individual class on sources of productivity growth in the 20<sup>th</sup> century and role of technology including IT.

Cooper Union (spring 2002). Taught individual class to undergraduates on information technology and productivity growth.

## **Other presentations (selected)**

Wellesley College (February 2011), APPAM Conference (November 2009), Measurement Congress (May 2008), Johns Hopkins (February 2008), Senator Jeff Bingaman (February 2007), Chicago Federal Reserve Bank (February 2007), National Science Foundation (October 2006), Joint Economic Committee (August 2006), San Francisco Federal Reserve Bank (March 2006), Intel Corporation (March 2006), George Washington University (February 2006), Meeting of top Finnish CEOs at FRB (November 2005), National Economists Club (September 2005), University of Michigan (November 2004), Embassy of the United Kingdom (April 2004), Congressional Budget Office (November 2003), Econometric Society (January 2003).

## **Work in Progress and Unpublished Working Papers**

Prices of Nails and Screws since 1700: What can we learn from Prices of Common-place Products? on program for 2011 NBER/CRIW Summer Institute.

“Time-to-Plan Lags for Commercial Construction Projects: Some Stylized Facts,” (with Jonathan Millar and Stephen Oliner), 2011, mimeo.

“The Evolution of Household Income Volatility,” (with Karen Dynan and Douglas Elmendorf), Finance and Economics Discussion Series, Federal Reserve Board, 2007-61.

“A Primer on the Macroeconomics Implications of Population Aging,” Finance and Economics Discussion Series, Federal Reserve Board, 2007-1.

“Financial Innovation and the Great Moderation: What Do the Household Data Say?” (with Karen Dynan and Douglas Elmendorf), prepared for the San Francisco Federal Reserve conference on Financial Innovations and the Real Economy, 2006.

## **Awards and Honors**

Kendrick Prize, 2010. In recognition of major contributions by articles published in *The Review of Income and Wealth*. (“Intangible Capital and Economic Growth”)

Abramson Scroll, 2008. Awarded by the National Association for Business Economics for outstanding articles published in *Business Economics*. (“Shifting Trends in Semiconductor Prices and the Pace of Technological Progress”)

Federal Reserve Board Special Achievement Award, 2002.

Phi Beta Kappa, University of Michigan.

Truman Scholar from Michigan, 1981.