MPRA

Login | Create Account | Admin

Munich Personal RePEc Archive

Browse Advanced Search Statistics Links FAQ About Help

On the mathematic prediction of economic and social crises: toward a harmonic interpretation of the Kondratiev wave

Albers, Scott and Albers, Andrew L. (2012): *On the mathematic prediction of economic and social crises: toward a harmonic interpretation of the Kondratiev wave.*



PDF
MPRA_paper_37771.pdf
Download (6MB) | Preview

Abstract

In Part One of this paper we use the harmonic analogy of a musical octave to analyze mathematic ratios of U.S. real GNP. These ratios are generated by bringing together figures for U.S. real GNP over intervals of time – “spreads of years” – as numerator and denominator in a single fraction. Using a range of 7-year to 18-year “spreads,” we find that this approach provides strong evidence that American economic history is composed of four 14-year quarter-cycles within a 56 year circuit in the real GNP of the United States, 1869-2007. These periods correlate closely with analysis by Nickolai Kondratiev and provide a framework for predicting an annual steady state rate of growth for the United States falling between 3.4969% and 3.4995% per year. In Part Two of this paper we provide three postscripts including: (1) correlations / speculations on the political and social consequences of this model, (2) simplification / expansion of the geometries implied and (3) analysis / prediction based upon this approach, as concluded by a brief afterword. These post-script refinements narrow the steady state rate of growth predicted to between 3.4969% and 3.4973% per year correlating closely with the 3.4971% rate for annualized quarterly data calculated for Okun’s Law, 1947-2007. The size and interconnectedness of world economies, and the virtually exact correlations provided herein, suggest that the dates predicted for future crises will see changes which are unexpectedly global, dramatic and fierce.

Item Type: MPRA Paper

Original Title: On the mathematic prediction of economic and social crises: toward a harmonic interpretation of the Kondratiev wave

English Title: On the mathematic prediction of economic and social crises: toward a harmonic interpretation of the Kondratiev wave

Language: English

Keywords: Real GNP, Golden Mean, Phi, Long Wave, Kondratiev Wave, Global Financial Crisis, Constitutional Law, American Economic History, Revolution, Consolidation, GNP Spiral, Okun’s Law, “The Great Moderation,” Constitutional Amendments, Steady-state Rate of Growth

Subjects: N - Economic History > N1 - Macroeconomics and Monetary Economics ; Industrial Structure ; Growth ; Fluctuations > N10 - General, International, or Comparative
O - Economic Development, Innovation, Technological Change, and Growth > O4 - Economic Growth and Aggregate Productivity > O40 - General
A - General Economics and Teaching > A1 - General Economics > A10 - General
E - Macroeconomics and Monetary Economics > E6 - Macroeconomic Policy, Macroeconomic Aspects of Public Finance, and General Outlook > E60 - General
B - History of Economic Thought, Methodology, and Heterodox Approaches > B1 - History of Economic Thought through 1925 > B15 - Historical ; Institutional ; Evolutionary
O - Economic Development, Innovation, Technological Change, and Growth > O1 - Economic Development > O11 - Macroeconomic Analyses of Economic Development
C - Mathematical and Quantitative Methods > C5 - Econometric Modeling > C53 - Forecasting and Prediction Methods ; Simulation Methods
E - Macroeconomics and Monetary Economics > E2 - Consumption, Saving, Production, Investment, Labor Markets, and Informal Economy > E27 - Forecasting and Simulation: Models and Applications
C - Mathematical and Quantitative Methods > C0 - General > C02 - Mathematical Methods
Z - Other Special Topics > Z0 - General
B - History of Economic Thought, Methodology, and Heterodox Approaches > B1 - History of Economic Thought through 1925 > B16 - Quantitative and Mathematical
K - Law and Economics > K1 - Basic Areas of Law > K19 - Other
B - History of Economic Thought, Methodology, and Heterodox Approaches > B5 - Current Heterodox Approaches > B59 - Other
E - Macroeconomics and Monetary Economics > E3 - Prices, Business Fluctuations, and Cycles > E37 - Forecasting and Simulation: Models and

Applications
B - History of Economic Thought, Methodology, and Heterodox Approaches > B4 - Economic Methodology > B41 - Economic Methodology

Item ID: 37771

Depositing User: Scott Albers

Date Deposited: 31 Mar 2012 22:34

Last Modified: 27 Sep 2019 15:43

References:

Ayres, R. U. (2006). 'Did the Fifth K-Wave Begin in 1990-92? Has it been Aborted by Globalization?' Kondratieff Waves, Warfare and World Security / Ed. By T. C. Devezas, Amsterdam: IOS Press, pp. 57-71.

Beard, Charles A. and Mary R. Beard, The Rise of American Civilization, New Edition, The Macmillan Company, New York.

Benner, S. (1875). Benner's Prophecies of FutureUps and Downs in Prices: What Years to Make Money on Pig Iron, Hogs, Corn and Provisions, Robert Clark and Company, Cincinnati.

Bernanke, B. (2004). "The Great Moderation," Remarks by Governor Ben S. Bernanke, Eastern Economic Association, Washington D.C., February 20, 2004.

Black, W. (2012). "Prepared Testimony of William K. Black, Associate Professor of Economics and Law, University of Missouri-Kansas City, Before a hearing of the Senate Committee on the Judiciary Entitled: —Examining Lending Discrimination Practices and Foreclosure Abuses March 7, 2012"

Chomsky, N. (2011). " 'The Great Moderation' and the International Assault on Labor," In These Times, May 2, 2011.

Cleal, Rosamund M. J.; K. E. Walker, and R. Montague (1995). Stonehenge in its landscape: Twentieth century excavations. London: English Heritage.

Coccia, M. (2010). "The Asymmetric path of Economic Long Waves," Technological Forecasting and Social Change, Vol. 77, 2010, pp. 730-738.

Cochrane, J. H. (1988). 'How Big Is The Random Walk In GNP?' The Journal of Political Economy, Volume 96, Issue 5. 893-920 at 894.

DeWolff, S. (1924). "Prosperitats- und Depressionsperioden." In O. Jenssen, ed., Der Lebendige Marxismus, 13-43, Jena: Thuringer Verlagsanstalt, 1924.

Devezas, T. ( ). "The Longwave phenomenon: Open Questions and New Insights,"

Devezas, T., Corredine, J. (2001). The Biological Determinants of long-wave behaviour in socioeconomic growth and development, Technological Forecasting & Social Change 68:1-57.

Devezas, T., George Modelski (2003). Power law behavior and world system evolution: A millennial learning process, Technological Forecsting and Social Change, 70: 819-859.

Devezas, T., George Modelski (2008). "The Portugese as system-builders – Technological innovation in early globalization." Globalization as Evolutionary Process: Modelling Global Change, Taylor-Francis, 2008:30-57.

Dickson, D. (1983). 'Technology and Cycles of Boom and Bust.' Science 219/4587:933-936.

Euclid of Alexandria, Elements.

Funk, J M. The 56-Year Cycle in American Business Activity. Ottawa. IL. 1932.

Garraty, J. (1966). The American Nation, A History of the United States, Harper American Heritage Textbook.

Georgescu-Roegen, N. (1977). "Inequality, Limits and Growth from a Bioeconomic Point of View," Review of Social Economy, XXXV, 3:361.

Goldstein, J. (1988). Long Cycles: Prosperity and War in the Modern Age, Yale University Press, New Haven, Conn.

Gowdy, J. and Susan Mesner (1998). "The Evolution of Georgescu-Roegen's Bioeconomics," Review of Social Economy, Volume LVI No. 2, Summer 1998.

Hemenway, P. (2005). Divine Proportion, Phi In Art, Nature and Science, Sterling Publishing Company, New York, NY 10016.

Jourdon, P. (2007). La monnaie unique europeenne et sa relation au developpement economique et social coordonnee: une analyses cliometrique, Tome II, Entelequia, 2010; These, Montpellier, Universite Montpellier I, 2008.

Kahn, H. (1961). On Thermonuclear War, Second Edition with Index, Princeton University Press, Princeton, New Jersey, 1961.

Knotek, E. (2007). 'How Useful Is Okun's Law?' Economic Review, Kansas City Federal Reserve, Issue Q IV, pp. 73-103.

Kondratiev, N. D., The Major Economic Cycles (in Russian), Moscow, 1925; translated and published as The Long Wave Cycle by Richardson & Snyder, New York, 1984.

Korotayev, A. V. and Sergey V. Tsirel, (2010). 'A Spectral Analysis of World GDP Dynamics: Kondratieff Waves, Kuznets Swings, Juglar and Kitchin Cycles in Global Economic Development, and the 2008–2009 Economic Crisis,' Journal of Structure and Dynamics, Social Dynamics and Complexity, Institute for Mathematical Behavioral Sciences, University of California at Irvine.

Krugman, P. "How Did Economists Get It So Wrong?" New York Times, September 2, 2009.

Lester, T. (2012). "The Other Man," Smithsonian Magazine, Washington, D.C., February 2012.

Linstone, H. A. (2006). The Information and Molecular Ages: Will K-Waves Persist? Kondratieff Waves, Warfare and World Security / Ed. By T. C. Devezas, Amsterdam: IOS Press. pp. 260-269.

Livio, M. (2002). The Golden Ratio: The Story of the World's Most Astonishing Number, Broadway Books, New York.

Louca, F. (1999). "Nikolai Kondratiev and the Early Consensus and Dissensions about History and Statistics". History of Political Economicy 31 (1): 169–206.

Marchetti, C. (1988). 'Kondratiev Revisited – After One Kondratiev Cycle,' International Institute for Applied Systems Analysis, p. 7.

Mandel, E. (1980). Long Waves of Capitalist Development. Cambridge, UK: Cambridge University Press.

Marchetti, C. (1980). Society as a Learning System, Discovery, Invention and Innovation Cycles Revisited, Technological Forecasting and Social Change 18:267-282.

Marshall, A. (1920). Principles of Economics, MacMillan and Company, London, 1890, 1920, 8th Edition.

McCauley, J. (2009). Dynamics of Markets: The New Financial Economics, 2nd Edition, Cambridge University Press.

McMinn, D. (2006). Market Timing By the Moon & The Sun. Twin Palms Publishing.

McMinn, D. (2007). Market Timing By The Number 56. Twin Palms Publishing.

McMinn, D. (2012). The 9/56 Year Cycle: Earthquakes in Peru, The Phillipines and Selected U.S. States, presently being peer-reviewed in New Concepts in Global Tectonics.

McMinn, D. (September 2011). The 9/56 Year Cycle: Earthquakes in Selected Countries, New Concepts in Global Tectonics, No. 60:9-37.

McMinn, D. (June 2011). The 9/56 Year Cycle: Record Earthquakes, New Concepts in Global Tectonics, 59:88-104.

McMinn, D. (June 2011). The 9/56 Year Cycle: Hurricanes, New Concepts in Global Tectonics, 59:105-111.

McMinn, D. (March 2011). The 9/56 Year Cycle: California Earthquakes, New Concepts in Global Tectonics, 58:33-44.

Modelski, G. (2008). Globalization as evolutionary process: modeling global change, Routledge, New York, NY, 2008.

Modelski, T. (1996). Leading Sectors and World Politics: The Coevolution of Global Politics and Economics. Columbia, SC: University of South Carolina Press.

Nelson, C. R. and C. I. Plosser (1982). 'Trends and Random Walks in Macroeconomic Time Series: Some Evidence and Implications,' Journal of Monetary Economics, 10:139-162.

Ollman, B. (1976). Alienation: Marx's Conception of Man in Capitalist Society, Cambridge University Press, 1976.

Palmer, R., Joel Colton, (1969). A History Of The Modern World, Alfred A. Knopf Publishers, New York, N. Y., Third Edition.

Rothbard, M. (1984). 'The Kondratieff Cycle: Real or Fabricated?', Investment Insights, August and September, 1984.

Rucker, R. (1983). Infinity And The Mind, The Science And Philosophy Of The Infinite, Bantam Books, December 1983;84-88.

Schumpeter, J. A. (1939). Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process, New York and London: McGraw-Hill Book Company, Inc.

Sethares, W. A. (1992). "Relating Tuning and Timbre," Experimental Musical Instruments, September 1992.

Sim, S. (1984). The Joseph Cycle: Will The STI Rise to 4300?

Skinner, S. (2006). Sacred Geometry, Sterling Publishing, New York, NY. 10016.

Smith, N. (2011). What I learned in econ grad school, Noahpinion, April 11, 2011.

Solomou, S., Phases of economic growth, 1850-1973: Kondratieff waves and Kuznets swings, Cambridge University Press, 1990.

Sowell, F. (1992). 'Modeling long run behavior with the fractional ARIMA model,' Journal of Monetary Economics, 29:277-302.

Solow, R. (2010). "Prepared Statement Robert Solow Professor Emeritus, House Committee on Science and Technology Subcommittee on Investigations and Oversight "Building a Science of Economics for the Real World" July 20, 2010."

Stewart, H. (1989). Recollecting the Future: A View of Business, Technology and Innovation in the Next 30 Years, Dow Jones-Irwin.

Stiglitz, J. (2011). "Re-Thinking Macroeconomics: What Failed, and How To Repair It?" Journal of the European Economic Association, June 28, 2011, Volume 9, Issue 4, Pages 591-645, August 2011.

Tausch, A. (2011). 'On the global political and economic environment of the current Al Jazeera Revolution,' Middle East Studies On-Line Journal, Issue 5, Volume 2.

Tausch, A. (2006). 'Global Terrorism and World Political Cycles.' History and Mathematics: Analyzing and Modeling Global Development / Ed. by L. Grinin, V. C. de Munck, A. Korotayev. Moscow: KomKniga/URSS, pp. 99-126.

Thompson, W. R. (2007). 'The Kondratieff Wave as Global Social Process,' World System History, Encyclopedia of Life Support Systems, UNESCO / Ed. by G. Modelski, R. A. Denmark. Oxford: EOLSS Publishers.

Tobin, J. (1983). "Okun, Arthur M." The New Palgrave Dictionary of Economics, Vol. 3, pp. 700-701, Macmillan, London.

Van Duijn, J. J. (1983). The Long Wave in Economic Life. Boston, MA: Allen and Unwin.

Van Gelderen, J. (1913). (J. Feder pseudo.) "Springvloed: Beschouwingen over industrieele ontwikkeling en prijsbeweging" (Spring Tides of Industrial Development and Price Movements). De nieuwe tijd 18 (1913).

von Mises, L. (1949) Human Action: A Treatise on Economics, New Haven, Yale University Press.

Wallerstein, I. (1984). Economic Cycles and Socialist Policies. Futures 16/6: 579-585.

Wilson, E. (1994). Naturalist, Island Press, Washington D. C.

Wilson, E. (1998). Consilience: The Unity of Knowledge, Alfred A Knopf, New York.

Williams, D. (1947). Rhythmic Cycles in American Business, Henry George School of Social Sciences. New York. Apr 16, 1947.

Williams, D. (1959). Astro-Economics. Llewellyn Publications Ltd.

Williams, D. (1982). Financial Astrology. American Federation of Astrologers.

Historical Statistics of the United States: Colonial Times to 1970, Part 1, United States Department of Commerce, Series F 1-5, "Gross National Product" for the United States between the years 1869-1970 according to 1958 prices.

American casualty counts during the Vietnam War are kept at the National Archives and may be found at

House Bill 3995, presented by Representative Kaptur, November 3, 2009, 111th Congress, First Session.

Digest of Education Statistics, Table 99, Public secondary schools, by grade span, average school size and state or jurisdiction: 2007-2008, National Center for Education Statistics; and Enrollment of public secondary schools, by state, 2007-2008, collected at the request of the authors from the NCES on Friday, June 10, 2011.

URI: https://mpra.ub.uni-muenchen.de/id/eprint/37771

All papers reproduced by permission. Reproduction and distribution subject to the approval of the copyright owners.

View Item

Contact us: mpra@ub.uni-muenchen.de

Atom RSS 1.0 RSS 2.0

This repository has been built using EPrints software.

MPRA is a RePEc service hosted by Universitätsbibliothek Ludwig-Maximilians-Universität München.

Munich Personal RePEc Archive Privacy Statement Copyright and Disclaimer