

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

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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.

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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.

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